The Tropical Agriculturist.

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DEPARTMENT OF ENTOMOLOGY

BETTS'
PATENT IMPROVED INCORRODIBLE
TEA LEAD.

BRAND. BRAND.

This article will be found greatly superior to the ordinary Rolled Lead, combining advantages as an hermetic metallic envelope for Tea.

The *Tin* surface prevents oxidation or change of color from the effects of climate, and with the Body of Metal beneath forms a kind of Solder when in contact with the Soldering Iron, which materially assists the workmen in securing an air-tight seam or joint. The Metal is pliable, tough, exceedingly close in grain, and free from holes.

Inventors of BETTS' METAL, Manufacturers of

PATENT TEA LEAD, Lamina Wove Metals for Damp Walls, TINFOILS and Capsules.

MANUFACTORIES—London:—1, Wharf Road, City Road, E.C. Batavia Mills, Upper Holloway. Birmingham:—Moor Green Mills.

Telegraphic Address: "BISHLANE, LONDON." *ESTABLISHED* 1850.

TEA PLANTER'S STORES.

PLANTATION HOES AND FORKS,

Spades and Shovels, Axes, Adzes, Pickaxes, Pruning Knives, Grass-hooks, &c.

Nails of all descriptions, Hoop-iron, Tin, Solder, Galvanized Wire, Galvanized Corrugated Sheets, Buckets, Files, Chisels, Hammers, Screws, Planes, Paints and Colours, Tasting Pots and Cups, Tea-house Lamps, Scales, Wooden Tea Shovels, Sheet Zinc, and every requisite for tea cultivation, in large or small quantities.

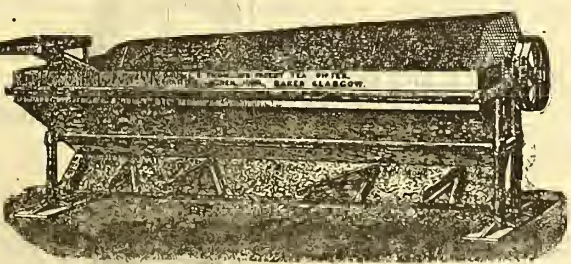
Every Article guaranteed to be of Durable quality, and the most suitable for the purpose, at Low Prices.

BISHOP & Co.,

27 & 28, LITTLE TRINITY LANE, LONDON;

AND AT BIRMINGHAM AND SHEFFIELD.

Baillie and Thomson's Patent Tea Sifter.



Telegrams: McNEILL, **Glasgow.**

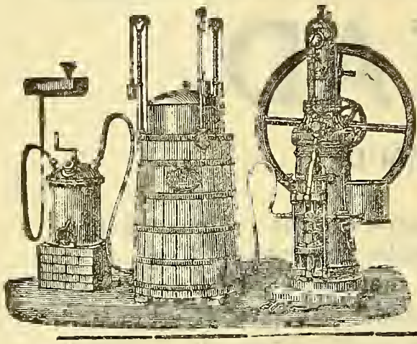
Is the Most Efficient, Durable and Economical Sifting Machine in the Market

For Prices and Testimonials apply to the SOLE MAKER,

CHARLES McNEILL, JUNR. KINNING PARK IRON WORKS, GLASGOW.

SODA-WATER MACHINERY

BOTTLES, BOXES, AND ALL APPLIANCES FOR THE AERATED WATER TRADE.



As the result of latest improvements our Machines effect a saving of quite 50 per cent. in labour and material.

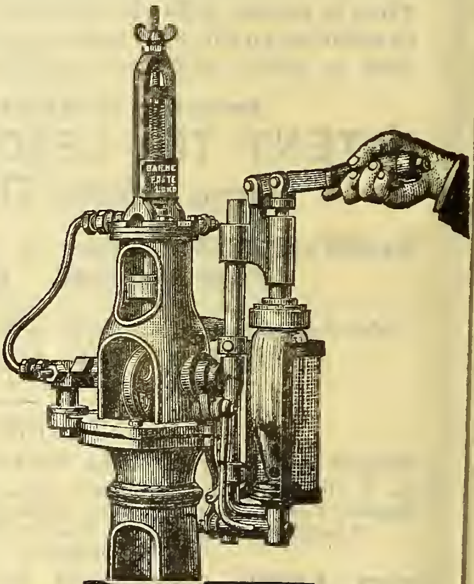
The "NIAGARA" MACHINES are fast superseding all other kinds for the manufacture of first-class Aerated Waters, and are in use in most of the leading manufactories in the world.

A	size single, as drawing, capacity	600 dozen large bottle per day...		£60
B	,, ,, ,,	1,200 ,, ,, ,,	...	75
C	,, Double Pumps and Cylinder	2,400 ,, ,, ,,	...	125
D	,, ,, ,,	4,000 ,, ,, ,,	...	180
E	,, ,, ,,	7,000 ,, ,, ,,	...	250

Thousands of testimonials have been received by us from users of these Machines

Send for particulars of the "**NIAGARA**" **AUTOMATIC GENERATOR**, the perfection of ingenuity—it is Self-feeding with Whiting and Acid, and Self-emptying

The "Excelsior" Turnover Filling Machine.



This is the most serviceable, reliable, and economical in the market. A boy can syrup and fill 60 to 80 dozen per hour.

There is no waste of Syrup, Water, or Gas!

It has the only Syrup Pump where there is no strain upon the glass barrel, consequently this never breaks. The Pump Leather is self-tightening, and will wear and last for years without touching.

It is the quickest in filling!

It is the quickest for altering and adjusting syrup! Both are done with the thumb and finger.

It is by far the strongest!

It is comparatively valveless!

It is the simplest to work, and most lasting!

It is not liable to get out of order, having but few working parts!

Price, with Glass Barrel Syrup Pump, and all recent improvements, including also an extra glass barrel and set of spanners, £9 9 0.

Where Power is used we recommend the "Eclipse" Filling Machine. One operator can syrup, fill and deliver full-sized bottles at the rate of 200 dozen per hour. Estimated cost of filling ¼d. per gross of first-class waters.

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"NIAGARA" BOTTLE.

Or Improved CODD'S.

Is admitted to be the most perfect in the market

SEND FOR SAMPLE AND COMPARE

PRICES ON APPLICATION.

Name on bottles free for Orders of 30 gross. Under that quantity moulds charged 10s. for orders for each size or shape. Extra Rings, 1s. 6d. per gross, printed with name of owner 2d. per gross extra.

BUY THE

"LONDON-MADE"

Title] SYPHON. [Regd.

And Support British Industry.

It is the Strongest, Cheapest, Han somest and Best in the World

PURE BLOCK TIN TOPS.

PRICE 1/6 EACH.

Nickel plating Tops, from 1½d. ea
Silver-plating Tops, ,, 3½d. ,
Marking on Tops, Free.
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PALE ALE AND STOUT.—In Wood, R1·50 per Gallon.
In 2½, 5, 9, and 18 Gallon Casks. R5 charged as deposit on Cask

DITTO IN BOTTLE.—R4·50 per dozen Quarts. R2·50 per dozen Pints

CONTINENTAL, A LIGHT ALE.—R3·50 per dozen Quarts. R2·25 per dozen Pints.

CHAMPAGNE ALE.—R4·50 per dozen Quarts. R3 per dozen Pints.

STRONG ALE.—R6 per dozen Quarts. R4 per dozen Pints.

Ales and Stouts delivered FREE at any Railway Station.

GINGER ALE, "SPLENDID FOR SHANDY."—R0·75 per Gallon.
In 2½, 5, 9, 18, and 54 Gallon Casks.

Ales, Stouts, sold for **Cash only**, direct from the Brewery.

SPECIAL TERMS FOR ANY OF THE ABOVE IN BULK.

Agents for Colombo and Kandy Messrs. CARGILL & Co.. For Badulla.. Messrs. HEANLY, VEALL & Co.
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A specially prepared High-class Sugar-Cane Fertiliser, used in the West Indies for several years with most satisfactory results.

SUPERPHOSPHATES, SULPHATE OF AMMONIA,
AND SPECIAL FERTILISERS FOR COFFEE, TEA, &c.

GUARANTEED ANALYSIS.

THOMAS FARMER & CO.,

(Established 1778),

CHEMICAL MANUFACTURERS,

MARK LANE, LONDON.

APPLICATIONS FOR AGENCIES INVITED.

SUTTON'S SEEDS,

Direct from Reading, England.

SUTTON'S "EXPORT BOX" OF FLOWER SEEDS,
Price 21s.

45 Sorts, including Antirrhinum, Aster, Balsam, Cineraria, Dianthus, Heliotrope, Larkspur, Lobelia, Mignonette, Nasturtium, Pansy, Petunia, Phlox Drummondii Poppy, Stock, Sweet Peas, Sweet William, Wallflower, and others.

SUTTON'S "EXPORT BOX" OF VEGETABLE SEEDS,
Price 25s.

56 Sorts, including Broad Beans, French Beans, Brocoli, Brussels Sprouts, Borecole or Kale, Cabbage, Cauliflower, Cucumber, Carrot, Celery, Kohl Rabi, Lettuce, Leek, Onion, Peas, Radish, Tomato, Vegetable Marrow, and others.

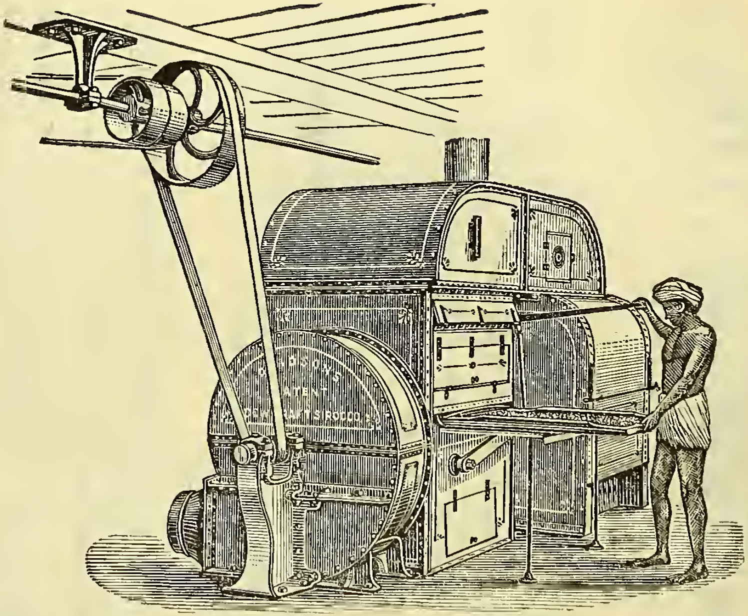
Delivered Free by Parcel Post to any Address in India and Ceylon on receipt of Remittance.

SUTTON & SONS, the Queen's Seedsmen, READING, ENGLAND.

DAVIDSON'S PATENT

SIROCCO TEA DRIERS,

OVER 2,300 NOW IN USE.



THE NEW DOWN-DRAFT SIROCCO

Dries Tea Leaf *in eight minutes*, with pure hot air at 240° F., at which temperature this very rapid rate of drying produces *the highest quality of tea* obtainable from the leaf used.

The Apparatus works on ground level, neither pit nor platform being required.

The air is heated by our new patent cast-iron flue "Sirocco" stove, the construction of which is very strong and durable. Any fuel may be used, and about ¾ lbs. of wood will dry 1 lb. of tea.

The "Down-draft Sirocco" is easily erected. The principal working parts are sent in made-up sections, and merely require to be bolted together to form the complete machine, which, when erected, is 7 feet high, and it occupies a floor space of only 6 feet by 12 feet.

These Machines are in two sizes as follows :—

Large size, Down-Draft Sirocco estimated to dry about 200 lbs. Tea per hour. £ 185
Small size, ditto ditto 150 ,, ,, £ 150

acked and Delivered F. O. B., the outward Steamer at Birkenhead or Glasgow, and complete, with trays, thermometer, smoke chimney, fire-irons, countershaft angers and pulleys. Terms—Cash against documents.

From—A. Dickson, Esq., General Superintendent of the South Sylhet Tea Company, Limited, Bulisera Division, Kalighat, 10th December 1890.

There are now a considerable number of down-draft Siroccos at work in our Factories, and they have in every way given our Managers **entire satisfaction** and have **fully borne out the estimate of work expected of them.** They are very handy machines to work with, and while they have been in almost constant work since we got them, **the stoves** up to the present show **no signs of wear from the effects of the fire.**

(*Continued over.*)

(*Continued*)

From—E. Bridge Esq., Managing Proprietor of Kapati Tea Estate, Mangaldai, Assam.

Extract from letter dated 20th November 1890.

All through this season there has been no hitch of any sort in the working of my down-draft Sirocco, and I have used **no other machine whatever.** In my estimation it is **the most perfect tea drier in the market;** both as regards **economy in fuel** and for **amount of outturn,** both very material points in the selection of tea drying apparatus. The Down-draft is **absolutely faultless** and is a machine that before long will take **the first place among tea driers.**

A. A. Bull, Esq., Managing Proprietor of Baraoora Estate, Sylhet, writes us as follows:—

SYLHET, 11*th December* 1890.

I am much pleased with the **quantity and quality** of the work done by your Down-draft Sirocco. It has been worked daily right through the season and as a **really practical test** of its working capacity, I may mention I made close on 1,100 maunds of tea during September in this factory of which I calculate the Down-draft worked off quite **600 maunds.** This shows an average of about **23 maunds** a day for the 26 working days of the month.

Taking its working for 3 months as a still wider test, we made during August, September and October, about 3,000 maunds of tea, and of this I estimate the Down-draft did at least **1,600 maunds.** As we worked for 80 days in the factory during that period, it gives an average of about **20 maunds a day** as the outturn of the Down-draft.

I have examined **the stove** as it stands as carefully as possible, and it seems in **perfect order.**

These results are, I consider, very satis actory.

From—**J. N. Campbell,** Maskeliya, Ceylon, 12th November 1890.

After an experience of eighteen (18) months of the original small Down-draft Sirocco and 4½ months of the larger one I am of opinion that these machines *are capable of developing a very high quality of Tea,* while for convenience of working and economy of fuel *I know no machine equal to them.*

From—Major Keane, Managing Proprietor of Avon Grove Tea Estate, Darjeeling, dated 21st September 1890.

I have pleasure in informing you that after working your Down-draft Sirocco for **two seasons,** I am much pleased with it. **The stove is as good as new, and expect I will have no need to repair it for the next six or seven years.**

It is the neatest and best tea drier I have ever seen, and takes up only a **quarter of the space** occupied by my 20-Tray Sirocco.

DAVIDSON & Co.

SIROCCO WORKS, BELFAST, July 1890.

NEW IMPROVED UP-DRAFT SIROCCOS.

The new Improved Up-draft Siroccos, with **solid cast-iron flue stoves and top ventilating air-duct** and chimney for producing self-acting draft of hot air through the trays is now made to the following standard sizes:—

16-Tray Side-Drawer Sirocco	£130	Each complete, with Trays, Thermometer, Fire Irons, &c., &c., packed and delivered F. O. B. outward steamers at Birkenhead or Glasgow.
16 " End-slide "	£120	
12 " " "	£100	
8 " " "	£80	
4 " " "	£60	
No. 1 Sirocco (original make)	£85.	

These Machines can be had with an Exhaust Fan fitted in the Ventilating Air Duct, at an extra cost of £15 for 16 and 12-Tray and the smaller sizes at £12 extra. The Fan very considerably increases the out-turn of dried Tea while it does not prevent the machine being used with self-acting draft in the absence of motive power to drive the fan.

Orders can be Telegraphed free of charge, and full particulars and Lists of Planters' opinions obtained from

AGENTS:

MESSRS. MACKWOOD & CO., COLOMBO;

The Planters' Stores & Agency Co., Ld., Calcutta;

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Weaving Establishment,

Cannanore, Malabar Coast.

WE HAVE THE PLEASURE TO INVITE ATTENTION TO OUR LARGE AND VARIED STOCK OF

COTTON FABRICS

Known in all parts of India and Ceylon

AS

"Cannanore Goods" or **"Mission Goods,"**

ARE

HIGHLY appreciated and widely reputed for their "fineness of texture" and "durability," which are attributed to the superior twist from which they are manufactured. Being "light" and "cool" and "greatly washable," they will be found specially adapted for this climate.

The following comprise a list of what is daily turned out on our Hand Looms ;—

Trouserings

A rich assortment of stout, twilled, and plain texture, striped, checked, and mixed of various and fast colours, remaining fresh in wear and wash.

Imitation Tweeds,

Checks and Mixtures,

Corduroys and Drills,

In White, Khakee, and Brown.

Canvas

In White, Brown, and Khakee.

Hunting Cloth,

Plain and Twilled Textures, and Zig-Zag.

Ginghams

For Ladies' Morning Dresses, very durable of quality and colour. A variety of patterns also in Children's wear.

Abyssinian Shirtings

Of Striped and Fancy Patterns, well adapted for this climate.

WE PARTICULARLY RECOMMENDED OUR

Imitation Tweeds, Mixtures, Shikari Cloths, both Plain and Zig-zag, and a Large Variety of Ginghams

Drills and Checks

For Horsekeepers' and Servants' Suits.

Horse Jhooling

Light and Dark Coloured Designs.

Bed Ticking

Neat Striped Patterns.

Damask Table Cloths

by 6¼, 7 by 7, 7½ by 7½, or any length required

Damask Table Napkins

19", 22", 28" square.

(Continued up.)

BASEL MISSION—(*Continued.*)

Diamond Table Cloths

6' by 6', 7' by 7', 7½ by 7½, or any length require

Diamond Table Napkins

18", 20", 22" square.

Dessert D'Oyley

Face and Hand Towels

Honeycomb Pattern.

20" by 36", 24" by 36", 28" by 36".

Honeycomb Bath Towels

34" by 34", 34" by 45", 34" by 54", 34" by 62'.

Kitchen Towels

22" by 36", 24" by 36".

Counterpanes

For Single and Double Cots.

Toilet Table Covers,

Teapoy Covers,

Sheeting, Plain and Twilled, for Single and Double Beds.

Bath Sheets,

Duster Cloth, &c.

Small parcels not exceeding 18 or 20 lb. can be sent cheaper by Post at the rate of 4 Annas per lb. But all orders from Ceylon unaccompanied with Cash, shall be executed through our Agents, THE COLOMBO IRON WORKS LIMITED, COLOMBO, who will give any information required in respect of our Goods.

For Price Lists and Samples apply to

WALKER, SONS & CO., LTD.,
Colombo or Kandy ;

Or THE BASEL MISSION WEAVING ESTABT.
f Cannanore, Malabar Coast.

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BY WRITING ONE LETTER to the Agent at Colombo, intending travellers can obtain full particulars of Fares, &c., by all Steamer and Railway lines, and much information which cannot be obtained elsewhere, and which Messrs. THOMAS COOK & SON furnish.

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COFFEY'S PATENT CONTINUOUS WORKING STILLS.
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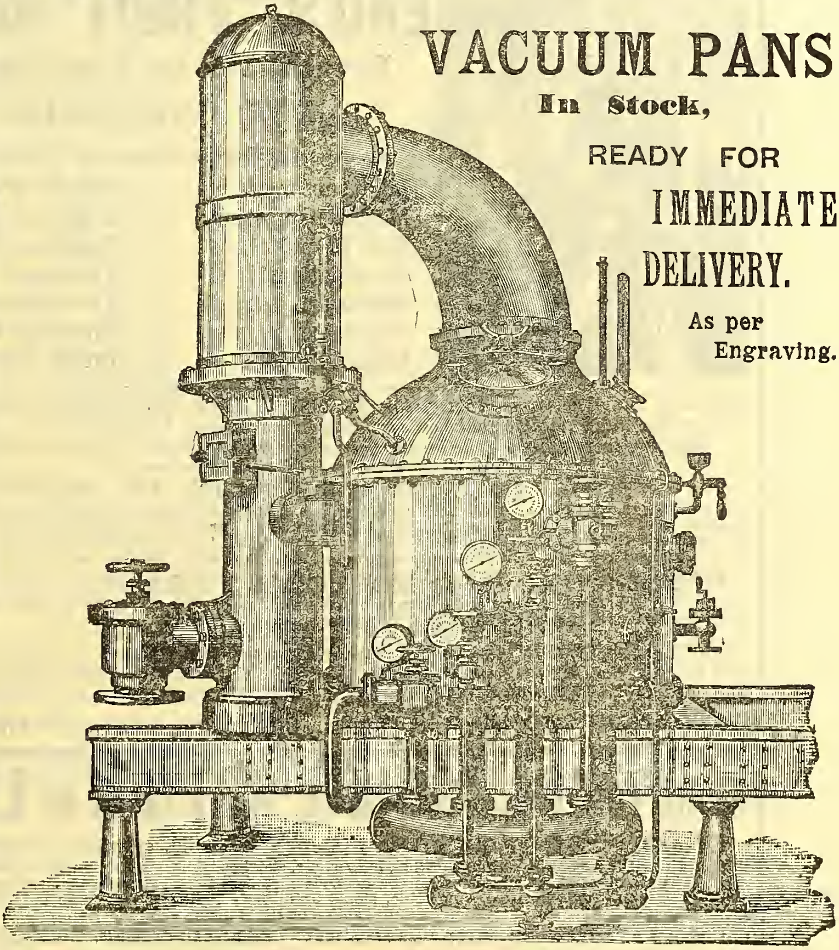

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FOR SUGAR PLANTATIONS,
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A Health-giving, Refreshing, Cooling, Sparkling, and Invigorating Summer Beverage, or for any Season, and a Gentle Laxative and Tonic in the various forms of Indigestion.

ENO'S "FRUIT SALT"

Invaluable to Residents in HOT COUNTRIES.

Is the best Preventive and Cure for

Biliousness. **Sick Headache.**
Mental Depression. **Want of Appetite.**
Skin Eruptions. **Pimples on the Face.**
Constipation. **Vomiting.**
Giddiness. **Feverishness.**
Thirst, &c. **Unnatural Excitement.**
Impure Blood. **Errors in Diet.**

Instead of being lowering to the system, ENO'S "FRUIT SALT" is in the highest degree Invigorating, and does not cake or get hard in warm and humid Climates. Its effect in relieving thirst, giving tone to the system, and aiding digestion, is MOST STRIKING.

TO AVOID INJURIOUS EFFECTS OF STIMULANTS.—Experience shows that porter, mild ales, port wine, sweet champagne, dark sherries, liqueurs, and brandies are all very apt to disagree; while light wines and gin or whisky, largely diluted with soda-water, will be found the least objectionable. ENO'S "FRUIT SALT" is particularly adapted for any constitutional weakness of the liver; it possesses the power of reparation when digestion has been disturbed or lost.

PRESERVING AND RESTORING HEALTH.—ENO'S "FRUIT SALT" has a natural action on the organs of digestion, absorption, circulation, respiration, secretion, and excretion, and removes all impurities, thus preserving and restoring health.

CAUTION.—*Legal Rights are protected in every civilised country. Examine each bottle and see that the Capsule is marked ENO'S "FRUIT SALT." Without it you have been imposed on by a* **WORTHLESS IMITATION.** *Sold by all Chemists, &c. Prepared only at*

ENO'S "FRUIT SALT" WORKS, Pomeroy St., London, S.E., by J. C. ENO'S Patent.

CURE FOR SLUGGISH ACTION OF LIVER

ENO'S "VEGETABLE MOTO" is mild, effective, and agreeable, and lasting without force or strain in indigestion, biliousness, sick headache, gout, rheumatism, female ailments, suppressed secretions, head affections, nervousness, sleeplessness from liver derangement, flatulence, wind on the stomach. As a laxative, stomachic, blood, brain, nerve, bile, or liver tonic pill it will be found invaluable for creating and sustaining a natural action of the stomach and biliary secretions.

ENO'S "VEGETABLE MOTO" (or Moto Pill). Sold by all Chemists. Prepared only at

ENO'S "FRUIT SALT" WORKS, Pomeroy Street, New Cross Road, London, S.E.

FAGGED, WEARY & WORN OUT!!

Anyone whose duties require them to undergo mental or unnatural excitement or strain should use

ENO'S "FRUIT SALT."

It allays nervous excitement, depression, and restores the nervous system to its proper condition (by natural means). It is the best preventive and cure for biliousness, sick headache, skin eruptions, impure blood, pimples on the face, giddiness, feverishness, mental depression, want of appetite, sourness of the stomach, heartburn, accidental indigestion, constipation, vomiting, thirst, &c., and to remove the effects of errors of eating and drinking.

STIMULANTS and insufficient amount of exercise frequently derange the liver. ENO'S "FRUIT SALT" is peculiarly adapted for any constitutional weakness of the liver. A world of woe is avoided by those who keep and use ENO'S "FRUIT SALT."

"THOUSANDS OF MILES IN INDIA."—ENO'S "FRUIT SALT" I have found for many years of the utmost value in the hot and dry seasons, also in the monsoons. I have travelled some thousands of miles in India during the last thirteen years, and in all the various changes of climate I have always found ENO'S "FRUIT SALT" the most refreshing beverage I could get, especially after long heavy marches and other fatiguing duties to which the British soldier of late has been exposed to. I am yours, &c., A Warder, at Central Military Prison, Poonah. Bombay, Jan. 30, 1884. To Mr. J. C. Eno.

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BLOOD, BRAIN, NERVE OR LIVER TONIC

ENO'S "VEGETABLE MOTO" in indigestion, biliousness, sick headache, giddiness, gout, rheumatism, female ailments, suppressed secretions, &c., head affections, nervousness, sleeplessness from liver derangement, flatulence, wind on the stomach, coughs and colds, will be found everything you could wish for, creating and sustaining a natural action of the stomach, bowels, and biliary secretions, &c., and (when necessary) in conjunction with ENO'S "FRUIT SALT" is invaluable.

ENO'S "VEGETABLE MOTO" (or Moto Pill). Sold by all Chemists, etc. Prepared only at

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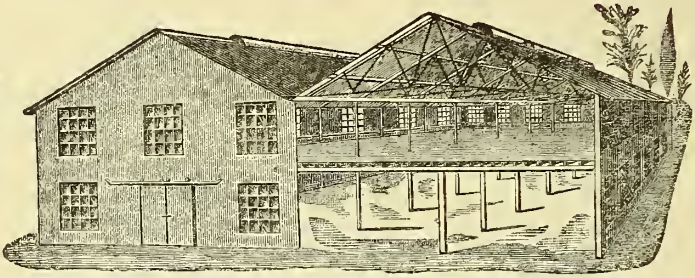
Constructed with a view to Safety in Transit, Ease of Transport, and Ready Re-erection by Unskilled Labour.



Tropical Rainfall and Wind Pressure carefully calculated for in Designing.

FIRE-PROOF, WROUGHT IRON THROUGHOUT.

SPECIALLY DESIGNED AND ADAPTED TO THE REQUIREMENTS OF

Tea, Coffee, Sugar, Indigo, & Cotton Estates, Rice Mills, &c.

As Factories, "Godowns," Warehouses, Machinery, Drying and Packing Sheds.

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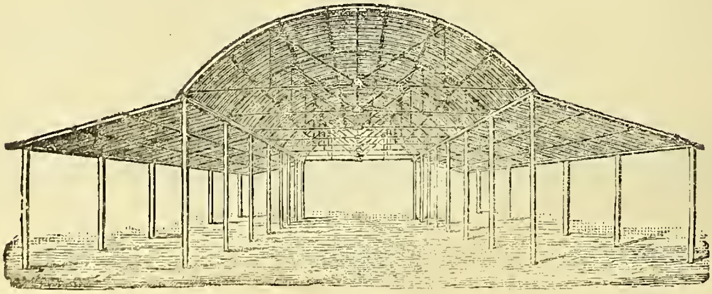

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THOMSON'S

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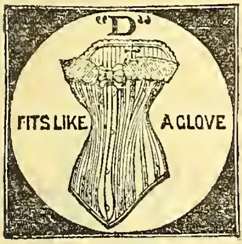

"GLOVE-FITTING"

CORSET

The perfection of Shape, Finish, and Durability, and approved by the whole polite world.

ANNUAL SALE ONE MILLION PAIRS.

To be had of all dealers throughout the world.

W. S. THOMSON & Co., Ld, London,

MANUFACTURERS.

See that every Corset is marked "THOMSON'S GLOVE-FITTING," and bears our Trade Mark, the Crown.

No others are genuine.

NEW ENGLISH PERFUME

Crab Apple Blossoms.

Regd.

"It would not be possible to conceive of a more delicate and delightful perfume than the **'Crab Apple Blossoms,'** which is put up by the Crown Perfumery Company, of London. It has the aroma of spring in it, and one could use it for a lifetime and never tire of it."—*New York Observer.*

"It is the daintiest and most delicious of perfumes, and in a few months has superseded all others in the boudoirs of the grandes dames of London, Paris, and New York.—*The Argonaut.*

Put up in 1, 2, 3, & 4 ounce Bottles.

INVIGORATING LAVENDER SALTS.

"Our readers who are in the habit of purchasing that delicious perfume, **'Crab-Apple Blossoms,'** of the Crown Perfumery Company, should procure also a bottle of their **'Invigorating Lavender Salts.'** By leaving the stopper out for a few moments a delightful perfume escapes, which freshens and purifies the air most enjoyably." *Le Follet.*

SOLD EVERYWHERE.

Genuine only with Crown Stoppers as shown herewith. Reject Spurious Imitations.

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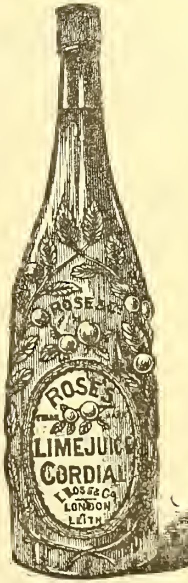

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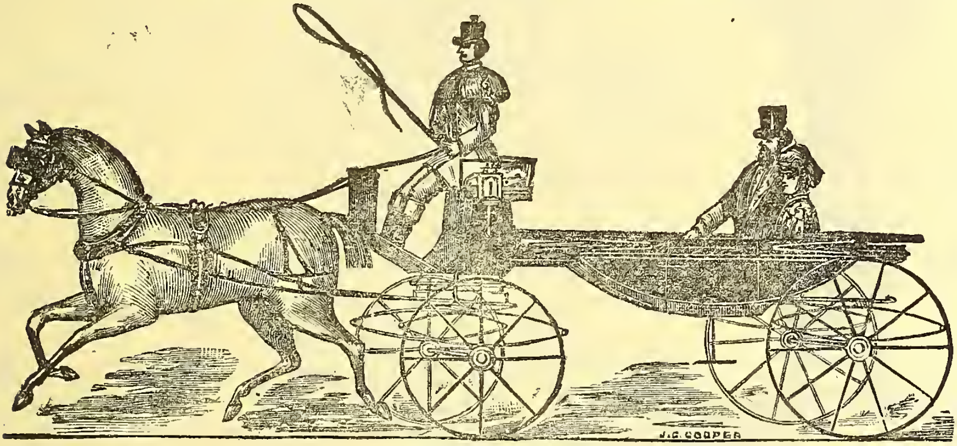

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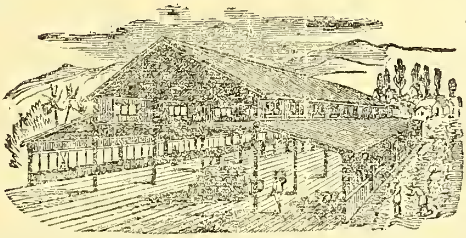

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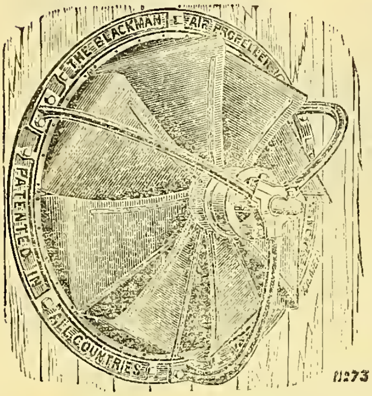

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In conclusion, we have to tender our thanks to readers and contributors, and our wish that all friends may continue to write instructively and to read with approval for then, indeed, must the "**Tropical Agriculturist**" continue to do well.

A. M. & J. FERGUSON.

COLOMBO, CEYLON : 1ST JUNE 1891

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GEM MINING PROSPECTS IN BURMA.

WHAT DO THE RUBY MINES OF MOGOK PRODUCE?—THE COMPANY'S MONOPOLY—SHANS SELLING RUBIES—THE WORKING AND MISMANAGEMENT OF THE COMPANY—TRANSPORT DIFFICULTIES.

(Concluded.)

IT is to be feared that as regards even testing the capabilities of the Ruby Mining concession, much less proving them, but little can be said of the past year's operations at Mogok. The shareholders will have to possess their souls in patience for some time yet apparently, and "soft words" which "turn away wrath" will be all they will get for their outlay for an indefinite period of the future.

It has often been asked "what amount of rubies are produced at the mines of Mogok, and the answer has varied from "nothing at all," to some impossible value not worth putting on record. In the report from which we quoted above there is an estimate of value required to purchase for the native miners "imported commodities." This amount is put down at £5,000 sterling per annum, so that at any rate that value of rubies must be set apart to meet the one item of expenditure at the mines; but "under the late kings of Burma these mines were a royal monopoly and very closely and jealously guarded from all foreigners and indeed from all natives as well, with the exception of the miners and officials engaged in working them. The king is said to have drawn from them an annual revenue of one and a half to two lakhs of rupees, apart from his absolute right to all stones found that were above a certain weight and quality. This mode of working must have restricted the output of these mines very considerably, and must have caused many of the larger stones to disappear altogether." This is all very indefinite, and it is equally impossible to find out what value if any at all—of large rubies are found now, or were ever found in the time of the kings of Burmah; and at the present day the only thing absolutely decided is that, the Ruby Mining Company are not getting any valuable stones. Whether anyone else is doing so is a mere matter of conjecture; as also if discovered what value is to be attached to them. Sir Lepel Griffin had but little to say on this point, indeed it could hardly have been expected he should have ventured any remarks upon it. "As to the produce of Mogok, it is very difficult to say. I do not believe anybody living knows. A great authority at Mandalay, a dealer, who is accustomed to export in a small way, about a lakh of rupees a year (which it is supposed he smuggles out of our mines) says about fifteen lakhs worth are sold in Mandalay each year, quite independent of Rangoon. He is not in a large way of business but he is a broker for a great many firms. If what he says is true—and I am disposed very much to believe it for I don't think he wishes to deceive me—these native miners must make a great deal of money." It seems at present impossible to get any nearer to a correct conclusion about the outturn of these mines than it was at any time in the past, especially as it is supposed—or rather we may say well-known—that precious stones are not exclusively found in the district of Mogok. Sir Lepel Griffin affected to believe they were so exclusively found, and that his Company had without doubt a monopoly, or the equivalent of a monopoly in working them. He says:—"The Government do nothing except through us—that is our concession. They are not working rubies in Upper Burmah except in one place. They have not conceded—and will not concede—land to other people however much they may think of it. The Chief Commissioner will modify certain rules where necessary. There are said to be good rubies at Sagyan, a little way down the river, which I think may be worked but we have the preferential right. The Government gave us the right of taking it up if we choose, and

we certainly shall choose if the Government wish it worked at all. We shall not let anybody else work it. Even if we raise a subsidiary company to do it it will be worked." This is all very well in its way, but it is more than probable that if other Companies should choose to demand a concession, and applied to the supreme authority for it, they would sooner or later obtain what they asked for. It is not conceivable that in the present days of free trade a monopoly of a valuable trade, such as the ruby trade is supposed to be, should be monopolised by a few shareholders in London. Powerful no doubt the Company is, and large the powers of the Indian Government, but if it were made a public question and pressure brought to bear in the proper quarter there can be no doubt such a monopoly would cease to exist in reality as it has already done on paper. The Ruby Act gives the Chief Commissioner of Burma authority to grant concessions of mining rights to anyone, to whom he may choose to give them, and such option would have to give way to the demands of any powerful body who were in a position to make themselves heard and felt.

In the meantime however until the promises and pretensions of the present Company have been redeemed by the declaration of exceedingly handsome dividends, it is not probable that others will embark upon a similar venture. The future is still before them and they may yet prove a brilliant success and in such case no doubt their example will be followed by other wealthy and powerful syndicates. The market for really valuable rubies is said to have advanced a great deal in price. The Shan-trader said "the price of really fine rubies now is from R1,000 to R1,500 per carat. I saw R8,000 refused in Rangoon a few days ago for a ruby of about 7 carats. The owner said it had been about fifteen years in his family. His mother had bought it for R700. I have got a parcel of stones in the Mandalay Treasury which the Company did not care to purchase at the price I put on them, and they will remain there until I pay the thirty percent duty on the value, or until the value is obtained at auction."

From a private letter published however in one of the local journals we take the following paragraph:—

"Do you know if it is wrong to buy rubies from the Shans? I mean do Streeter's claims come into question? Perhaps this is a silly inquiry, but it is one that several besides myself would like answered, my bosom friend bought a stone last year but made me promise not to mention it. I should say that Streeter's rights are confined to the Ruby Mine tract only. Strangely enough, though the Shans ask such absurd prices for their ponies they part with their rubies for a mere song." The latter statement is by no means singular, for it is commonly made by most persons whose avocations have brought them in contact with the hill tribes of Upper Burma.

The pacification of the Ruby Mines district has made great strides during the past year, at great expense of life and money. Fever of a very fatal description was very prevalent amongst the troops and military police and the mortality was very deplorable. Dacoits in a small way are still frequent, and the road from Thabyetkyin on the river bank to the sanitarium at Bernardmyo, is daily traversed by patrols who take charge of all travellers passing to and fro. Very recently we read in the journals of the day "Three Military Policemen were attacked whilst cutting jungle near Thabyetkyin in the Ruby Mines District, two of them were killed, the third managed to escape" and again:—"News has come to hand of a daring murder being committed in the Ruby Mines, an inspector of police was coming into his district with an armed sepoy orderly and a number of coolies who were carrying the camp kit. Suddenly the inspector heard a shot, and riding quickly up found the sepoy lying dead and his revolver and ammunition gone. The coolies dropped the kit and fled, but subsequently returned."

From many inquiries made from residents in the Ruby Mines district we gather there are always a number of evil disposed persons wandering about —ready to commit robbery and murder whenever an opportunity offers. There are no large sytematised gangs of dacoits at present in the district, but it is not at all desirable to neglect taking every possible precaution when journeying through the country.

It is impossible to say where or when travellers may be attacked, especially when booty in the shape of arms or money is obtainable. That this state of affairs may continue for many years yet to come is highly probable seeing that Mogok lies on the outskirts of the great hill-country reaching far into Chinese territory, inhabited by wild tribes who will for ages to come be continually recruiting bodies of marauders to prey upon their more civilised neighbours, "for 'tis their nature too" as Dr. Watts writes of other animals but a shade more savage than those of whom we are writing.

The deductions we drew from our several interviews with Sir Lepel Griffin and Mr. Kirby, one of the directors of the Company, are expressed in a few paragraphs we addressed to one of the Burma locals and which we now reproduce for the benefit of our readers.

Sir Lepel Griffin has a straightforward way of giving expression to his opinions on public occasions, which carries conviction with it, though his hearers may not always relish the tenor of his remarks. His address to the shareholders at the first half-yearly meeting of the Ruby Mines Company, held in the middle of last year, is an example of this, as also his speech at the Burma dinner of the same time. We gather from his utterances, that he is of the same opinion now as he was then, and is able more clearly to realise the difficulties which beset the initiation of operations at Magok. Taking all the circumstances into consideration, and having seen for himself, and made every inquiry possible during his brief visit, he can, on his return to London, do but little else than emphasise the opinion he expressed six months ago. We should, however, be inclined to think that he is not altogether satisfied with some minor details in the administration of the Company's affairs in Burma. In saying so much we must be clearly understood to be stating our own deductions from the manner, rather than from the expressed tenor of his remarks. He evidently concluded that it was an error sending out too many European assistants when there was absolutely nothing for them to do, and before sufficient preparations had been made for their comfort and subsistence. Then again no doubt a considerable amount of incongruity had arisen from certain operations having been entrusted to men which were not appropriate to their special qualifications. In other words, the work has not been altogether

judiciously distributed amongst the employeès and as a consequence, it had not made such progress as might otherwise have been expected. No special censure could, of course, be passed upon the individual though the system inaugurated at the mines could not altogether merit his approbation. Such, we take it, will probably be the tenor of the remarks with which Sir Lepel Griffin will meet the shareholders at the approaching half yearly meeting; and are only such as could well be expected by any one who has had the opportunity of gathering information from time to time since the commencement of operations in Upper Burma. The question of ultimate and brilliant success as a mercantile venture was one on which (of course) we cannot expect him to be explicit, but we imagine he will have to tone down to a considerable extent the confident tone in which the prospectus of the company was primarily put forward.

We learn that Mr. Kirby who accompanied Sir Lepel Griffin to the Ruby Mines was more inclined to take a serious view of the dangers and difficulties of a trip to Mogok than did the Chairman himself. The latter certainly made light of the journey, while as an Engineer, Mr. Kirby no doubt bore in mind that material as well as men have to be transported along what he termed "a wretched road." In regard to the staff of Europeans employed by the Ruby Mines Company, it would appear probable that there would shortly be a reduction rather than an increase in numbers. Europeans, for some reason or another not apparent to a casual visitor, seem to suffer very greatly in health, and a considerable percentage become physically useless in a very short time. This has been his invariable experience in regard to all large undertakings in India—and the Ruby Mines by no means proves an exception to the rule. Trained natives have eventually to be entrusted with the work—and it is with this class of men that it is completed. He, however, admitted that acclimatised Europeans would have to hold control over the natives, evidently being of opinion that something beside physical energy and endurance was required by those in command. People in England could not possibly comprehend the difficulty—in fact the impossibility—of the transport of the machinery and other material from Tabeitkyin to Mogok until the road was completed, and that was only within the last month or two. Then again the constant sickliness of the ntative workmen, as well as their European superiors, created a difficulty almost as superlative as that of the want of roads and means of transport. It was only now that there was any chance of being able to make a commencement with the search for gems, and as the machinery was got to work no doubt rapid progress would be made.

Taking a general view of the country, and judging of course from what he has seen during the flying visit up to Mandalay and Mogok, he had not formed a very high opinion as to its immediate future. He did not see what there was to be done with a country of such immense proportions and no population, and with but exceedingly small provision for transport. Anything in the way of agriculture would naturally be attempted in the hills more immediately adjacent to the seaports or at any rate, as near to them as the nature of the country and the measure of rainfall would allow.

One point in Mr. Kirby's remarks must not be forgotten. In mentioning the delay that had taken place in forwarding the machinery sent up to Thabeitkyin over a year ago, he pointed out that this machinery was not sent out by the Company, but by Mr. Streeter himself before the Company was formed, and was afterwards purchased by the latter. We leave it to our readers to consider whether this in any way affects the question, our own idea is that it may be classed as a distinction without a difference. If the Company's agents did not want the machinery they should have left it alone. In taking it over, they at the same time, took over the responsiblity of its utility or otherwise.

ROYAL BOTANIC GARDENT, PERADENIYA, IN 1838 AND SUCCEEDING YEARS.

(*From Official Records.*)

(*Continued from Vol. IX., page 835.*)

His Excellency the Rt. Hon'ble the GOVERNOR.

Sir,—I have the honor to forward per this opportunity the "Melon seeds" required by Your Excellency for Mr. Dyke, also (enclosed) the interesting letter from that gentleman, and I beg to return Your Excellency my grateful acknowledgement for the kindness of transferring it for my perusal.

I have the honor to be, Sir, Your Excellency's very faithful Servant,

J. G. LEAR.

Royal Botanic Garden, 31st August 1839.

His Excellency the Rt. Hon'ble the GOVERNOR.

Sir,—I have the honor to acknowledge the receipt of your Excellency's note of 25th instant, and the "40 copies of orchidea drawings (which prove the same that I had the honor to request of your Excellency), also of two packets of "Cape and American seeds" which shall have my particular attention.

I have the honor to be, Sir, Your Excellency's most obedient faithful Servant,

J. G. LEAR.

Royal Botanic Garden, 26th September 1839.

His Excellency the Rt. Hon'ble the GOVERNOR,

Sir,—I have the honor to inform Your Excellency that I could forward the plants required for the Queen's House whenever the border there is prepared for their reception, but I beg to suggest that they had better wait until at least a short continuance of rain could be depended upon. With respect to my tour via Nuwera Ellia and Badulla, I have written Captain Kelson on the subject, agreeably to Your Excellency's wish, who is prepared to see me at any time; that gentleman has also written Captain Rogers, and in the event of an answer from the latter gentleman before that time, I shall proceed to *Nuwera Ellia* on the 4th proximo.

If Your Excellency requires the *evergreens* immediately, I will put them in readiness before my departure from Peradenia.

I have the honor to be, Sir, Your Excellency's most obedient faithful Servant,

J. G. LEAR.

Royal Botanic Gardens, Oct. 30th, 1839.

Memorandum called for by His Excellency the Rt. Hon'ble the GOVERNOR.

Royal Botanic Garden Establishment.

Superintendent, Clerk, Draftsman and Storekeeper' 2 Kanganies, 1 Gardener, 1 Plant Collector and Specimen Maker, 2 Lascoreens, 30 Coolies, 8 Boys.

Cost of Establishment	£52
Artificers' work and other contingencies	4
	£56

per month.

Mr. Lear thinks it but just to himself to add that after collecting what is due to the Establish-

ment for the sale of plants, seeds, &c., since he has taken charge of it, he will be able to forward to the Government Treasury nearly £40.

The cost of the Establishment during the first year of each Superintendent's charge that has been there is as annexed:—

	Year.	£
Mr. Moon ..	1817	1750
,, Walker ..	1825	1639
,, McRae ..	18·6	1563
,, Bi·d ..	1830	1498*
,, Watson ..	1832	1563*
,, Lear ..	1839	720

His Excellency the Rt. Hon'ble the GOVERNOR,

Sir,—I have the honor to return the queries which Your Excellency was pleased to put to me, answered as near and correct as I possibly can, and Your Excellency's other directions shall have my best attention.

I have the honor to be. Sir, Your Excellency's most obedient and grateful Servant,

J. G. LEAR.

Royal Botanic Gardens, Sept. 18th, 1839.

Memo. FOR MR. LEAR.

Kandy, September 18th, 1839,

Question.—What is your present salary from this Government?

Answer.—£150 per annum.

Q.—Are ¾ths of the ground of the Botanic Garden, which was under jungle when you became Superintendent, cleared of the jungle and made fit for botanical purposes?

A.—No—half, with much alteration and improvement of that previously kept up by my predecessor.

Q.—Can you, and within what period clear what remains of the jungle, on the ground, whereon Mr. Moon had planted rare or Ceylon plants with your present force?

A.—No, not at all, without neglecting that which I have already cleared.

Q.—If you can't, what additional force will you require, and what would be the additional monthly cost of labour, and in what time with this additional force can you clear it?

A.—30 men, £22 10s, 3 months.

Q.—About how many acres (at a guess), and about what portion do they form of the whole garden, has Mr. Wright in lease?

A.—65 by the survey, one-half.

Q.—What is the endurance of his lease, its commencement and termination?

A.—6 years, February 1836, 31st December 1845.

Q.—Can you give me a memo. of your monthly establishment and its costs?

A.—Yes, herewith enclosed.

Mr. Lear will please to mark whatever Chinese plants, vines and other plants from London belong to H. E. by a small bit of wood or lead with "Governor" cleared marked on each.

The vegetable and other seed beds can at any time be known that have been sown with seed.

His Excellency the Rt. Hon'ble the GOVERNOR,

Sir,—I have the honor to forward herewith the seeds as requested by Your Excellency's letter of the 1st instant, and hope they will prove satisfactory. Those seeds which I had the honor to notice to Your Excellency in Colombo as having been received from Mr. Knight are, of vegetables, a collection limited in quantity to that which would be necessary to prove by experiment what are best adapted for this climate, and for that purpose as suggested by me, Mr. Knight has had the collection made up very select, numerous, and in small quantities, and I think we could not have received them at a better season or in more excellent order. The *fruits*, *palms* and ornamental shrubs and trees are from Mr. Knight's collector in South America, and of that superior character which will justify my saying that it would be difficult hereafter to procure a similar or as good a collection, and certainly nowhere on this Island could they be expected to have that necessary attention which they would receive at the Botanic Garden. I hope therefore that Your Excellency will be pleased to allow me to bring them to account for this establishment, and not distribute them at present through the Island as was suggested by Your Excellency previously.

In the humble and sincere hope that this may meet with Your Excellency's pleasure,

I have the honor to be, Sir, Your Excellency's most obedient humble Servant,

J. G. LEAR.

Royal Botanic Garden, 3rd November 1834.

His Excellency the Rt. Hon'ble the GOVERNOR'

Sir,—I have the honor to inform Your Excellency of my arrival at Newera Ellia, where I reached on the 4th instant. I saw Captain Kelson on the 5th, who has pointed out to me the land Your Excellency fixed upon for experimental purposes; he has also handed me a survey of the same. I have examined it well, and for the use to which Your Excellency intends to apply it I know of no situation where the choice could be improved. The soil of the *plain* is perhaps not strictly speaking that which general report gives the tea to delight on, neither does it exactly correspond with that recommended for the growth of tea in the popular works of the day, but soil apart (which by draining and otherwise can be greatly improved), every other circumstance seems *particularly* favourable to the production of that article, and eventually I should doubt not of success. Captain Kelson has sent me 8 coolies this morning, and I have commenced clearing on the S. E. side of the forest, jungle where I understood Your Excellency (by description) as the place where Your Excellency wished me to form the nursery for tea. I very highly approve of the spot, and hope soon to have it in readiness, but with respect to the quantity necessary, I should (most humbly) suggest 2 acres as quite sufficient at present for *that purpose*, and as land is apt to deteriorate by exposure, it is the more desirable that no more be cleared than is actually necessary. Should Your Excellency approve of my plan, I shall confine myself to the abovementioned quantity, and when the work necessary upon that is completed, I shall immediately proceed to Badulla as previously directed by Your Excellency. I expect the above work will occupy my time up to the 17th instant, and if Your Excellency has any further commands (independent of my duty) it will afford me the most agreeable pleasure to attend the execution of them.

I have the honor to be Sir, Your Excellency's very grateful and most obedient humble Servant,

J. G. LEAR.

Newera Ellia, 6th November. 1839.

Newera Ellia, 23rd Nov. 1839.

His Excellency the Rt. Hon'ble the GOVERNOR,

Sir,—I have the honor to acknowledge the receipt of Your Excellency's letter of the 14th instant, and according to its tenor, I beg to hand Your Excellency the result of my investigation of the land referred to,

* Some coffee returned to Government during these years, the amount of which is not ascertained.

The tract pointed out to me by the Mohattal of the district as purchased by Your Excellency, is about 8 miles S. W. of Badulla, and is called Oodooroowawatte, in the Oodapalata of the Yatakinde of Oovah. It is about 4 miles distant from the road leading from Newera Ellia to Badulla, where it would be necessary to form a path, as it is now approached with difficulty by a track crossing several paddy-fields and streams.

It is supposed that a road could be made to it with comparative ease, as a stream of water passing through the land in question has its course in nearly a straight direction towards the main road to Badulla; which road it crosses at about 3½ miles from that place.

The general appearance of the forest as it is approached from the Badulla road, is that of a deep narrow valley with steep sides rising to the summit of bare manna hills; easily accessible at its northern boundary, where the stream just mentioned leaves it.

The quantity of land approaching a level surface, is comparatively very little indeed; being confined to a narrow tract on each side of the stream, where the appearance of the soil is on the surface, blackish, with a substratum rather yellow, and freely mixed with sand or soft stone; and must be of a very superior quality, necessarily arising from its peculiar situation.

There is a greater proportion of surface of easy declivity, where the soil is, as may be expected, of a quality considerably inferior to the former; yet, partaking of the same formation, and this may be considered of an average quality compared with the soils of this country. The extent of both these descriptions may be roughly estimated at about 200 acres.

Of the remainder very little can be advanced to recommend it, being chiefly composed of very sharp or strong steeps difficult in approach and in application of labour. There are also small patches of chena lands having been cultivated by the natives, but the exhaustion of land attendant on their system of cultivation is notorious, especially on slopes which is the land they have chosen in this case.

The remainder is Patana or Manna hills and is unsuited for plantations.

It is barely possible at one visit to form correct ideas of its extent, but I should suppose the whole to exceed 600 acres.

Concerning the supply of labour that may be obtained at this spot, the testimony of the residents and the appearance of the circumjacent country suggest but a scanty or irregular supply; perhaps for 8 months in the year, an adequate quantity may be obtained, but during the remainder or when the scanty population are busily engaged on their own land the supply of native labour cannot be otherwise than defective; if indeed any could be obtained, and this unfortunately happens at the crop season when they are most required.

A regular supply of Malabars may possibly be located there, but of the practicability of this I cannot speak. With respect to the 2 acres of land at Newera Ellia, on returning last evening from Badulla I found that the said quantity is already nearly cleared, and if the weather continues as favourable as at present for 3 or 4 more days, the necessary work upon it for the present will be completed.

I have the honor to be, Sir, Your Excellency's most obedient humble Servant,

J. G. LEAR.

His Excellency the Rt. Hon'ble the GOVERNOR.

Sir,—I had delayed reporting to Your Excellency the condition in which I left the tract of land in process of clearance at Newera Ellia (now some 13 days past) until I should hear how Your Excellency approved that report which was the result of my investigation of and visit to Badulla. But not having yet been honored with that expected and anxious intelligence, I beg forthwith to state for Your Excellency's information that the spot above alluded to is now ready for the reception of tea plants whenever they come to hand. There were 8 Caffre men employed 23 days, and the extent cleared is upwards of 2 acres, a good part of which is burned and entirely cleared of the fallen timber.

I have the honor to be, Sir, Your Excellency's most faithful and obedient Servant,

J. G. LEAR,

Royal Botanic Garden, Peradenia, Dec. 9th, 1839.

His Excellency the Rt. Hon'ble the GOVERNOR,

Sir,—I have the honor to acknowledge the receipt of Your Excellency's letter of the 11th instant and in answer beg to state as my opinion, that the tea plants intended for Newera Ellia could not arrive *in Colombo* at a better time than the month of March, to allow of their being taken to Newera Ellia *early* in *April*. With reference to the land at Badulla, I have no doubt but that Your Excellency's views, with respect to other produce than coffee, might be carried into effect with promising results but it is worthy of notice that the land objected to for coffee is very precipitate and difficult of access, which circumstance embodies many other objections. I should be most happy to have the honor of accompanying Your Excellency to the spot Should Your Excellency have decided upon cultivating it, the commencement might be made immediately, but I wish too earnestly for the success of the undertaking, to recommend such a system of procedure as the one contemplated. It is much to be *doubted* and *feared*, that the performance of a native's contract, in a business of that description, would never bear the test of examination, or prove otherwise than conducive of great disappointment and regret.

There is a fine tract of forest land on the range of mountains called Namanakoolakanda, about 8 to 10 miles from Badulla, and the best of it I believe is on the S. W. side, facing the district of Allipoot. I am led to believe it is well suited for coffee cultivation, and that is the only land I know of any extent near Badulla, and there I believe are several thousand acres.

I have the honor to be, Sir, Your Excellency's most obedient humble Servant,

J. G. LEAR.

Royal Botanic Garden, December 14th, 1839.

The Rt. Hon'ble the GOVERNOR, &c., &c., &c.

Sir,—I have the honor to acknowledge the receipt of Your Excellency's letter of the 24th instant, and seeds therein specified.

I think it will be advisable to sow the *tea* seeds at Peradenia and remove them when germinated to Newera Ellia; in the meantime the ground there can be put in readiness for them.

I have some doubts of the success of those seeds, the albumen on examination appears unhealthy, but I shall sow them this morning, and the result will soon be known.

It is perhaps not known to Your Excellency that there is a pure tea tree at Caltura Botanic Gardens, and I have been told there are some young ones also; if so, Your Excellency might secure them. I have received two seeds from the original tree there, one of which has become a plant.

With very grateful acknowledgments, I have the honor to return herewith Doctor Wallich's most agreeable letter to Your Excellency.

Mr. Normansell having arrived, I should prefer remaining at Peradenia until I have given him over charge, after which I shall most willingly revisit Newera Ellia and Badulla, if Your Excellency requires it. I am extremely sorry that I know of no person whom I should like to trust, at liberty to take charge of Your Excellency's property at the latter place. I did not examine the soil on Namanakoolakanda, but I have been well informed of its capabilities for coffee.

I have the honor to be, Sir, Your Excellency's most obedient faithful Servant,

J. G. LEAR.

P. S.—The *whole* of the *tea seeds now swim on the surface* being put in water.

J. G. LEAR.

Royal Botanic Garden, December 26th, 1839.

His Excellency the Rt. Hon'ble the GOVERNOR.

Sir,—I have the honor to acknowledge the receipt of your Excellency's letter of yesterday's date and with respect to the mangosteen and nutmeg plants, the former I believe would succeed well, if put out in a border or bed at the Queen's House, with a little fresh *moderately* wet *soil* about their roots, occasionally watered, and for a week or two sheltered from the strong heat of the sun.

The nutmegs, if I may judge from the general state in which they arrive from the coast, had much better be sent immediately to the Botanic Gardens, where I would see that they received the necessary attention, which they require to have paid them, on their first landing in *boxes*; they would then be also on the way to Badulla, and gaining strength against the time that land was there prepared for them. I think they would not thrive so well, or be so *little* likely to suffer in *Colombo* as in Kandy, if the same attention could there be paid them; but if Your Excellency prefers their remaining in Colombo, my belief is, that they could not be materially hurt (if planted in close beds, where they could be conveniently covered with cadjans from the sun) in a month or two a compost should be made for them, rather free and strong, than rich; a loam, with a mixture ⅓ of good vegetable mould, is the best, and as the plants are supposed to be small (about 6 or 8 inches high) the distance of 9 or 10 inches asunder every way would be quite sufficient for the time above specified.

Mangosteens require the same treatment if the same size, or increased distance in proportion as they are larger, until they are finally planted out, when they should be at least 20 feet asunder.

May I be permitted to enquire of Your Excellency, if the weather is now in Colombo, such as to warrant the safety of the plants required by Your Excellency to fill the borders in the Queen's House Garden, which are ready for dispatch at Your Excellency's pleasure, and accordingly shall have every attention.

I have the honor to be, Sir, Your Excellency's most obedient humble Servant,

J. G. LEAR.

Royal Botanic Gardens, Peradenia December

His Excellency the Rt. Hon'ble the GOVERNOR.

Sir,—I have the honor to acknowledge the receipt of Your Excellency's letter and 2 packets of *tea seeds*, which I am sorry to say (like the former) *swim* in water and otherwise appear somewhat unlikely to vegetate freely. They were sown this morning, and my constant best attention shall be paid to them. With reference to the culinary seeds from "Ronalds," upon enquiry I found that portions of those remaining had been sown by the Pavilion gardener at different times, and in the manner I had directed, but none of them after the first sowing succeeded, which I have but little doubt was owing to their age and bad condition when received, to which must be added the length of time they have been in the Island.

If there are any of them left, I will most gladly see to their being sown agreeably to Your Excellency's direction.

I think Mr. McGregor* would be *quite competent* to the charge at Badulla, if he had 6 months' instructions and experience from a coffee plantation now in its infancy, where he could get an insight of the regular routine of the business as it proceeded, and with a steady communicative person.

I have the honor to be, Sir, Your Excellency's most obedient grateful Servant,

J. G. LEAR.

Royal Botanic Garden, Dec. 31, 1839.

Newera Ellia, October 26, 1840.

The Rt. Hon'ble the GOVERNOR.

Sir,—I have the honor to enclose copy of a letter and a taxed bill for Your Excellency's information. I believe it is not required that the remittance alluded to should pass through my hands. I have also great pleasure in acquainting Your Excellency that I have received the seeds which you were pleased to entrust to my charge, and in a fine plot of ground in Your Excellency's lately purchased property I have sown them, and expect they will do well. The tea plants I am sorry to say are not so flourishing as could be wished; they have had, I find, to contend against a very bad season, and being rather weak when they were planted out, sufficiently accounts for their present appearance. A few of them are looking well which is proof enough that the climate is suitable and that they will eventually succeed. If I can be of any other service to Your Excellency during my stay at Newera Ellia, I earnestly hope you will please to command me.

I have the honor to remain with the greatest respect Sir, Your Excellency's most faithful obedient Servant,

J. G. LEAR.

Government Agent's Office, Colombo 21st Oct. 1840.

Sir,—I have the honor to enclose copy of a taxed bill received from the Surveyor-General dated 15th instant, amounting to £42-10-2¾, being fee due to Mr. Bagenall for surveying the piece of land at Palampittia in Lower Bulatgama purchased by you for the Right Hon'ble the Governor on the 30th ultimo, and to request that you will have the goodness to remit to this office the sum of £27-10-2¾ being the balance due on the above account.

I have the honor to be, Sir, your most obedient Servant,

C. R. BULLER,
Agent.

J. G. Lear, Esq., Kandy.

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* Mr. Lewis Macgregor, one of our pioneer planters, who subsequently migrated to California and died there. His brother Roderick was better known in later times. —ED. *T. A.*

MEMORANDUM OF A LOT OF CROWN LAND IN THE WESTERN PROVINCE SURVEYED BY LIEUTENANT BAGENALL, SHEWING THE SUM TO BE CHARGED TO THE PURCHASER OF THE LOT FOR SURVEYING, &c.

Number in the General List.	Date of Authentication.	By whom Surveyed.	Name of Applicant.	Situation.	Extents. Acres.	Roods.	Square Perches.	Rate per Acre.	Fees as per Proclamation of 22nd April 1803. £ s. d.	Proportion of Travelling Expenses. £ s. d.	Total. £ s. d.
0	1840 Sept. 25	Lt. Bagenall	Capt. Lillie	Palampitiya in Lower Bulatgamme	1,024	1	32	9*d.*	38 8 3⅜	4 1 11	42 10 2⅜
										Total ..	£42 10 2⅜

Surveyor-General's Office, Colombo, 15th October 1840.

(Signed) T. B. NORRIS, Surveyor General.

(Signed) J. T. BAGENALL, Lieut., C. R. Regt.

"True Copy," W. W. BULLER, Agent.

Newera Ellia, November 4th, 1840.

His Excellency the Rt. Hon'ble the GOVERNOR, &c., &c., &c.

Dear Sir,—I have great pleasure in acknowledging the receipt of Your Excellency's letter of the 30th ultimo, with a packet of seeds, all of which shall have my best attention. The great scarcity of coolies here will enable me, I fear, to proceed but slowly with the planting of the piece of ground you have mentioned; I hope nevertheless to complete it before my departure from hence.

My return to Colombo previous to embarking in the "Tigris" I trust will be in time for the removal of the fruit trees intended for Kornegalle, when I shall be most happy to superintend that or any other work Your Excellency may desire. Before leaving this neighbourhood I am anxious to instruct an old servant of mine, who already possesses some knowledge of the matter, in the mode of propagating the numerous and delightful variety of plants that abound in these regions, of which I wish to establish a moderate collection by the period of my return to this colony. Should that event take place as early as I am led to expect, to forward this desirable object, I require the temporary use of about 50 square yards of jungle land, and as it has occurred to me that the same person might be useful in giving an eye to the tea plants, I hope Your Excellency will not think me too presuming by soliciting permission to occupy a bit of land to the above extent, near the tea plantation, where I should feel rejoiced to offer so much of the services of my servant as Your Excellency would require for their protection, as in such case, from the proximity of both occupations, the one could interfere but in a very trifling manner with the duties of the other, and it would tend very materially towards furthering Your Excellency's views on the subject of tea cultivation, which I would most willingly do all in my power to assist.

I have the honor to remain Sir, Your Excellency's most dutiful Servant,

J. G. LEAR,

Nuwera Ellia, November 23rd, 1840.

His Excellency the Rt. Hon'ble the GOVERNOR, &c., &c., &c.

Dear Sir,—I have great pleasure in acknowledging the receipt of Your Excellency's letter of the 21st instant, with a packet of seeds, which, assisted by Captain Kelson, I have sown this morning. The rains which daily threaten to visit this part will, I hope, greatly contribute to their doing well. Captain Kelson has kindly promised to see to the whole garden in the absence of my servant, who I am grieved to say has been obliged to return to Kandy, owing to an inflammation in the chest, proceeding from a cold. I had proposed to leave here myself on Saturday next, but in consequence of intelligence from Colombo to the effect that the "Tigris" will leave sooner than was expected (about the 15th proximo), I have arranged to do so on Wednesday next, and to arrive at Peradenia on Friday, where I shall have to make a stay of about 5 or 6 days before proceeding to Colombo. I trust Your Excellency will pardon the delay in forwarding the memo. on forming a coffee nursery, &c. It is now in preparation, and I am sure I need only offer my indisposition as an apology for its not being much earlier completed.

If I can be useful to Your Excellency on my passage to England or whilst there, I humbly beg you will be pleased to command my most willing services.

I have the honor to remain with the greatest respect, Sir, Your Excellency's very obedient and faithful Servant,

J. G. LEAR.

For His Excellency the Rt. Hon'ble the GOVERNOR, &c., &c., &c.

MEMO:

On forming a coffee nursery in a forest intended for plantation, the first thing to consider is the extent requisite, and as a guide it may be borne in mind that one parah of seeds in the parchment skin will produce 40,000 plants; allowing for a moderate proportion of refuse, 3 parahs would therefore be more than enough for 100 acres. Seedlings from the tender nature of their cotyledons should be cautionally guarded from the full influence of the sun, in their early stage, *i. e.* for the first 6 months;

to do this effectually and at the same time on a simple and expeditious plan, (for 3 parahs of seed) half an acre of forest should have the underwood cleared away and be otherwise partially thinned, leaving only sufficient trees to ensure a light shade to the *soil* beneath them which should be *roughly* turned up with mamoties without regard to roots. In this state the seed should be sown upon it broadcast, and afterwards covered in with a rake breaking the lumps of earth &c. Should any seed appear above the surface, after this operation, they may be buried by a cooly going over the ground with a small stick and making a hole by its side so as to allow it to fall in. Judgment should be next employed in selecting proper and convenient sites for transplanted nurseries; they should be so chosen as to avoid as much as possible unnecessary waste of labour in removing them hence to their final situations. On every 100 acres three sites may be fixed upon of a little more than ¾ acre each, which being stocked with the now rising plants, at one foot asunder would be sufficient for that quantity. The soil for this purpose should be *entirely* cleared of brushwood and forest and as much of roots as may not prove too expensive and laborious; it should be also well turned up and renovated. If the seeds have been sown in November or December, the seedlings will be fit to transplant during the rains in April and May; care should be observed in raising them with a spade, they should not be forcibly drawn from the soil, but shaken out preserving all the fibrous roots; in selecting them from the seed ground, avoid any that are very weak; with a sharp knife shorten the tap root* and also all long spreading lateral roots; they will be now ready for planting out, the ground having been prepared as directed, lines should be next drawn (with a spade),† a drill or small trench should be made by its side, and by hand the plants should be placed against it 1 foot apart, drawing and lightly pressing the loose and removed soil against them as the work proceeds; care should be taken that they are not placed deeper in the earth than about one inch below what they were originally. By this process the use of the dibble is dispensed with, which is at all times objectionable when it *can* be avoided; there is no occasion for bedding as is commonly practised in this work. By following the preceding remarks, the now transplanted seedlings will be fine plants and fit for final removal in four months. In planting an estate, various plans are chosen and adopted by different individuals, who have perhaps equal pretentions to the right one, each following that which long custom may have dictated, and upon which they are capable of forming correct calculations, and this is so far right, but it shows an evident want of a general system founded upon enquiry into the clear truths of vegetable Physiology where it may be learnt that whatever course is found to be most consistent with the laws of nature is the most preferable one to pursue, and wise experience in Horticulture has most fully proved the fact. This is advanced merely to show the absurdity of that unsparing and unjustifiable mutilation which cannot be avoided in preparing and planting stumps. Seedlings are always preferable, and it is well to observe here that *much* depends upon the choice of *seeds*; they should be gathered when perfectly ripe, and if possible from young and vigorously healthy trees.

In planting, it is advisable to have holes made, and they should be rather wide than deep, say 9 or 10 by 16 inches.

J. G. Lear

Peradenia, December 7th, 1840.

Colombo, December 18th, 1840.

The Rt. Hon'ble the Governor of Ceylon, &c., &c., &c.

Dear Sir,—I beg to return Your Excellency my most sincere thanks for the flattering testimonial you have been pleased to furnish me with. In reference to Your Excellency's wish for my further ideas on Coffee planting, I have the honor to annex a memorandum, and which I trust will be found useful. With regard to the vines at Queen's House, I very much fear they are too large for removal to such a distance as Kurunagalle, particularly at this exceedingly dry season, and as *cuttings* root so easily, I should unhesitatingly advise some to be sent in preference to the old vines, the result I feel confident would be quite as satisfactory. The Mohandiram is also very unwell, so much so, that he cannot come into the Fort to see me, which circumstance I am most sorry to say forms an obstacle to the furtherance of the work Your Excellency was anxious I should attend to. I have however seen Mr. Venom with whom I hope to make such arrangements as will favour its completion under other guidance: Since my time in Colombo is now so very short, cuttings of all the vines I will not neglect. I have to offer my grateful acknowledgments for the kind enquiries Your Excellency makes for my health, and am rejoiced to say the change to Colombo had greatly benefitted me. I must now conclude by requesting that Your Excellency will condescend to believe my prayers will be constantly offered for uninterupted *health* and *happiness* to your excellent self and family. With most dutiful respect, I have the honor to be, Dear Sir, Your Excellency's most obedient and faithful servant,

J. G. Lear.

Memorandum.

Coffee plants 9 or 10 months old are preferable to any others for plantation; they will be then about 10 inches or 1 foot high; it is not material that they should have begun to branch out, if the plants are stocky and healthy; I should nevertheless rather they had one pair of lateral branches. Distance in rows ought to be determined with a

* Many persons offer objections to the practice here recommended, but the motive for observing it in all establishments where transplanting is carried on to any extent, is obvious, the simple operation of cutting off the tap root, merely weakens an unprofitable part to strengthen useful ones, the lateral and fibrous roots are thrown out more numerously and with greater vigour, and it is from *these alone* that a tree derives its principal support from the earth. The tap root is rather an elongation of the stem downwards, and is a conductor of the returning sap that has been separated in the body of the plant from the necessary secretions formed for its growth (length is not an object in this process), therefore, in addition to other reasons, by chequering the probability of its penetrating a subsoil injurious to its health, we do a service to the plant. Tap roots often decay in bad subsoil and thus a disease is ingendered, which by its natural tendency to ascend, will in times destroy the plant; hence it is want of health and not deficiency in length or dimensions of a tap root (*a*) from which (if from this source at all) the plant receives its injury. It may be questioned, for what has nature provided a tap root? And much may be said in favour of its preservation *when* nature *is left alone*, but *she only* can know the true circumstances that call for its use, and when art is resorted to, its entire abandonment can be reasonably defended on a due consideration of *known* consequences.

† The word came before us as "shade," but we do not quite understand Mr. Lear recommending the use of a spade, an "agricultural implement" seldom used in the cultivation of coffee in Ceylon.—Ed. *T. A.*

a Cutting this root when plants are *old*, such as make stumps, makes a wound that seldom *entirely* heals; the same operation performed when the plant is *young* or overgrown and scarcely leaves a cicatrice.

due regard to the nature of the soil and locality. On very fine soil, and in sheltered situations distance in rows 6 feet apart and rows from each other, 7 feet is in my opinion not too much—in poor soils and exposed situations 57* square is about the medium, the former I would top at 6 feet high, the latter at 4 ft. 6 in. high; when this operation is performed it should not be when the top may be pinched off with the thumb and finger, but when it has grown 6 or 8 inches higher than the height intended, thus a plant throws a little of its luxuriance in a natural way, and in the other system a bundle of suckers is the inevitable consequence. J. G. LEAR.

* ? 5' 7" square.—ED. *L. R.*

2

REPORT ON THE ROYAL BOTANIC GARDEN, PERADENIYA, NEAR KANDY.

(*By the late Dr. W. C. Ondaatje, Acting Botanical Superintendent, 1st June 1843.*)

Uses of Botanic Gardens.—In submitting my first Report on the Royal Botanic Garden to His Excellency the Governor, I beg very respectfully to avail myself of the opportunity to direct public attention to the great importance and utility of such an institution, both in a scientific as well as in a practical point of view. It is much to be regretted that so few seem to be alive to the benefits which may be derived to a country by the establishment of a Botanic Garden, which, while it assists men of talent and research in their studies of Natural Science, affords at the same time the best means of ascertaining the richness and variety of the vegetable productions, with which an all-bountiful Providence has adorned each land.

The excellent and learned Doctor William Carey in his introduction to the "Hortus Bengalensis" thus forcibly observes on the uses of Botanic Gardens: "By the formation of Botanic Gardens the labors of scientific men have been called forth and greatly aided, as these afford facilities for the improvement of Botanical Science, which might have been sought for in vain without the aid of such institutions. But the Botanic Gardens and other noble collections of plants in Europe could never have been brought to the perfection in which they now appear, had not public or private repositories of plants been formed in the different settlements in Asia, Africa and America;" and further that the|reat object of anin*titutionof this kind is, " the propagating of useful plants, natives of other countries, and the consequent enriching of the country into which they are introduced."

These observations of Doctor Carey, a Botanist of no small eminence, and who was himself of the Utilitarian School of Philosophy, appear to be sound, rational and conclusive.

But if such be the advantages of cultivating Botanical Science in a general point of view, of what greater importance must the study of that Science be in this fine country, where plants, the most beautiful, singular and useful are found spread over its whole extent, and where every effort to become acquainted with its economical productions, will most certainly be attended with no small profit.

I shall now proceed to the various points which I am anxious to submit to His Excellency's consideration, noticing them in the following order:—

Subject of the Report.— 1. The condition in which I have found the Garden.

2. A brief notice of some of the most useful plants at present growing in it.

3. The improvements I have been effecting.

4. A few suggestions for the advancement of the Garden.

1. *Condition of the Garden.*—It is with extreme reluctance that I enter on this point of my report as it may perhaps be considered that I take occasion to reflect on the labors of my predecessors. I beg therefore that it may be distinctly understood that I have not the remotest wish of detracting aught from the merit of their services; but a sense of duty to the Government and my own anxiety for the advancement and success of the Garden, render it obligatory on me briefly to advert to the condition in which I have found it.

When I took charge of the Garden which was in February last, nearly a month after the death of Mr. Normansell,* I feel bound to state, that it presented to me no very encouraging aspect; nor was it by any means in the condition in which I expected to find it. Little attention appeared to have been given to conduct it scientifically and with a reference to public good; or to preserve it in order and extend its cultivation. Several portions of land, surrounding the small extent of cultivated ground, are covered with thick jungle, and such even as were in a state of cultivation, as far back as the days of the indefatigable Moon and some of his immediate successors, from having been sadly neglected, are now overgrown with weeds, &c.

This useless exuberant vegetation occupies various conspicuous parts of the Garden, and I need hardly observe, that it greatly impedes the improvements which I propose effecting, independently of its being productive of no small injury to the cultivated parts themselves.

On examining these jungles, I find traces of exotic plants, roads, &c. which are evident indications of their having been at one time properly cultivated. Several roads and walks in the Garden have also been totally obliterated from various causes.

It affords me however much pleasure to be able to notice, that Mr. Normansell made a commencement of labelling all the plants he cultivated and began setting apart portions of ground for the purpose of planting them according to the "Natural Order," and I cannot also in justice omit to remark that the Garden is indebted to Mr. Lear (one of its former Superintendents) for many of the beautiful arrangements and orderly disposition of plants, flower beds, &c. now found in it.

2. *A brief notice of a few of the most useful plants in the Botanic Garden.*—One of the chief objects of a Botanical Garden being the introduction and cultivation of rare and useful plants, it may perhaps be desirable that I notice a few† of such as are at present growing in the Garden.

Sisso Seedlings sent to the Garden, by the Hon'ble P. Anstruther, Esq.—I have much satisfaction in being able to report on the success which has attended the introduction of the Sisso (Dalbergia Sisso, Roxb.) The seedlings of this most useful timber tree were chiefly obtained through the instrumentality of the Hon'ble P. Anstruther, Esq., and it will no doubt be gratifying to that gentleman to know the fact, as he has always felt an interest in the progress of the Botany of this Island.

From the vigorous growth of the plants (of which there are 160 in the Garden) it may be fairly anticipated that much benefit will be derived of the Colony, as they become generally introduced ‡

(*To be continued.*)

* To whose memory we believe we do no injustice in saying that during his short career in Ceylon he devoted much more attention to earning money by reporting on coffee land, than to the Botanical Gardens. —ED. *L. R.*

† For more plants, vide Appendix A.

‡ *Teak and Mahogany* thrive luxuriantly in the Garden, *Mesua ferra* (Iron wood) and *Dodonœa viscosa* (Switch Sorrel) yield wood which is *close grained*, and I think may be used *for wood cuts*. They are natives of Caltura, but are also found in the Central Province

THE CULTIVATION OF ALOE FIBRE IN MEXICO.

At the end of an article on Aloe Fibre cultivation in the *Bulletin Du Musee Commercial* which gives very much the information embodied in our pamphlet, we find an estimate appended of which we furnish a translation. We have adapted the figures as nearly as possible to local conditions so as to inform and encourage any Ceylon cultivators who are interested in the subject:—

COST FOR A PLANTATION OF ALOES OF 10,000 MECATES EQUAL TO ABOUT 120 ACRES.

	Piastres.*	equal to R
Value of 10,000 suckers	2,000	4,400
Enclosures with dry stones (fencing)	420	924
Clearing	375	825
Planting ...	250	550
During the 4 years of upkeep	1,250	2,750
Interest on the money engaged during 4 years ...	1,461	3,214
Total	5,756	12,663
Cost of working during 6 years.		
Steam engine, 3 horse-power	1,090	2,398
Machines for scraping ...	450	990
Shed for the machine ...	500	1,100
Cutting and transport of 24 million leaves ...	12,000	26,400
Salaries: (1 machinist at 1 piastre per diem, 8 labourers at 0·50 piastres) per diem ...	9,000	19,800
Wood, oil, repairs of machinery for 6 years ...	2,400	5,280
Diminished value of machines after 6 years' wear	924	2,033
Interest on the capital engaged in manufacture ...	1,468	3,230
Total	27,832	61,231
Cost of planting	5,756	12,663
Total	33,588	73,894
Produce:		
1,200,000 lb. of fibre at 15 centavos — per lb. (price in January 1889)	180,000	396,000
Net product	146,412	322,106

* 1 piastre equal to R2·20

There is surely enough encouragement here for either planters or merchants to make an attempt at business with Ceylon Aloes.

TO KILL CROWS.

TO THE EDITOR OF THE "AUSTRALASIAN."

Sir,—I have noticed several inquiries for methods for killing crows, and I find the following very effective. After skinning a carcass, thoroughly score all the fleshly parts (so that they will come away freely in small pieces), and well rub in fine strychnine; also poison all blood that is lying about, or if there is no blood, cut up the liver into small cubes (small enough for a crow to swallow), and place a little poison into the centre of each cube. Where there are no carcasses to be poisoned the following would be a good way; collect all blood when killing a sheep or bullock, and mix it with dissolved strychnine and then lay it down in favourable places; crows generally fly to trees when they feel the effects of the poison.—Yours, &c.

WILLIAM J. AUSTIN.

Mount Mercer, April 17.

—*Australasian.*

[There is just the danger that domestic animals or children might be poisoned.—ED. *T. A.*]

PADDY CULTIVATION.

A Galle correspondent writes:—"We are glad to find that Mr. William Jansz's frequent agitation in the matter of improved paddy cultivation has now been without its beneficial results, if the recommendation of the Select Committee are to be carried out. Mr. Jansz's scheme to afford relief to the native agriculturist was submitted to the Government Agent, Mr. P. A. Templer in the first instance who brought the matter to the notice of Government. The Committee in recommending that seed paddy be advanced more systematically and on a larger scale than heretofore to cultivators in poor circumstances has adopted Mr. Jansz's suggestion. The importation of good kinds of seed is another recommendation which was practically carried out by Mr. Jansz who obtained seed paddy from Batticaloa for cultivation in Galle."

REPORTS OF TEA COMPANIES.

By last mail you will have received from me the report of the Eastern Produce and Estates Company which was presented to the shareholders at the General Meeting held on Thursday. With this is forwarded to you the report of what passed at that meeting appearing in the *Money Market Review*. There is not much in this report to which your attention may specially be called, nor need anything be added as to progress made by the Company to the remarks with reference to it given in my letter of last week. The Chairman's reference to a possibly bright future for the coffee remaining in Ceylon had unfortunately to be qualified with a very important and significant "if." "*If*" he said, "they could find out how to get rid of the green bug, he thought they would all consider that there was a new future for the remaining coffee in Ceylon."

A further document connected with Ceylon Companies forwarded to you with this is the Report of the Ceylon Tea Plantations Company. It had been hoped by me that it would have been possible for me to have sent you this by the last mail, but it did not reach my hands till after that had left. It was presented to the shareholders at the third Annual General Meeting last Tuesday. The Report does not contain much in addition to the items of it commented on by me when writing by the last mail. It may be noticed, however, that the average price realised for the Company's tea had been 11d per lb. during 1889 as compared with 10½d during 1888. Evidently the Company does a large business beyond dealing with the produce of its own estates. These yielded only 937,407 lb.; while the amount cured by the Company, including its own produce, purchased tea, and for other proprietors, totalled 2,014,335 lb. The acreage of the properties is 5,446 acres, of which 2,673 are of tea in bearing and 993 of tea not yet yielding leaf. Very recently you were told by me of the intention of this Company to purchase more estates, and of the contemplated increase of the capital to £300,000 to effect this. From the report it appears that, on the 25th of March of this year, there were added to the properties owned by the Association the following estates: viz., East Holyrood, Waverley, Tangakelly, Cymru, Cameron's Land, Lochiel and Rosita; the acreage of these amounting to 2,314 acres. It is stated that Mr. H. K. Rutherford, the late manager in Ceylon, has been appointed Managing Director in London, and that Mr. G. A. Talbot has been appointed to succeed him in Ceylon. We have only seen a brief report of last Tuesday's meeting, but from it we gather that the proposals of the directors received unanimous adoption.—*London Cor.*

TEA SALES IN COLOMBO AND LONDON.

Surely "One Who Wants to Buy" must know as well as you and I do that considerably more than 2d is put down as the difference between London value and the Colombo equivalent. If he does not, this quotation from a valuation before me will teach him:

London Value	Colombo equivalent at 1/6½ exchange, Freight at £2.
1/4	72 cts.

At this rate of exchange 5½ cts. to the penny will not be very far out, and this means a difference of nearly 16 cts., which allows for a tolerably good margin of draft and loss in weight expenses even after the 2d charge has been taken account of. Finally, I did not *choose* an account sale because it was an unusual one. I quoted from it in the first instance because it was the last one to hand, and when my statements were challenged I naturally stuck to that particular account for subsequent corroboration. I eliminated draft and loss in every case; so, as I said before, it was as fair for one as for another. I allowed for no drawing charges because I don't pay them; and, if I did, as "One Who Wants to Buy" suggests, and charged for drawing myself, I should deserve, and probably obtain, the "sack." Shipping charges are, I repeat, about balanced by brokerage in Colombo.—C. T. G. in local 'Times."

The rise in the value of silver and in exchange is not pleasant for our planters who are all the readier to see their teas go to outside countries. To this end the local market, since our appeal, is being better supported, the offerings last week and this again being over 200,000 lb. The discussion continues over tea prices realized from sales locally and in London. Mr. Gordon Frazer writing to a contemporary contributes the following:—

C. T. G. writes that he does not consider loss in weight and draft, either in his own case or in calculating charges on Colombo bought teas. In this he is manifestly wrong, as a buyer *must* take it into consideration. For instance, in the case of the account sale he quotes from, had this tea been sold in Colombo the buyer would have had to pay for every pound invoiced, even including the samples taken out of the packages for the purpose of selling the tea here; yet, according to London custom, he receives payment for 1 lb. less than the actual weight in each package. The draft allowance must therefore be taken into account in calculating the cost of laying tea down in London. * * * The loss of 1 lb. per package from either the gross being just insufficient to turn the scale at home, or the tare being just over a certain number of pounds, frequently does happen. Taken all round, my opinion is that London charges on a ten-penny to a shilling tea in chests work out at as low a calculation as is ever safe to work upon, at about 1½d per lb., half chests costing rather more; and this may be taken as about a basis from which to work, the cost of laying down in London rising or falling as the value of the tea is higher or lower. Of course, when freights are abnormally high, as sometimes happens this also must be allowed for.

"One who wants to buy" adds:—

It will be seen that "C. T. G." admits, as I surmized was the case, that no allowance had been made by him for draft or loss in weight. But is that fair! I therefore really cannot see why "C. T. G." should object to the amount put down by buyers here as the cost of shipping and laying down teas in London. By eliminating draft, loss in weight, drawing charges, commission, and shipping charges, he of course reduces the cost, but how many can dispense with these charges! I know lots of instances where 1 ct. per lb. is charged for shipping and in estimating 2d I have very often been under the mark.

Just come back from a mill where I have turned out and weighed 4 chests purchased at last public sale, marked 75 lb. nett. Result=72 lb., 73 lb., 75.4 lb., 70.14 lb., total loss 8.14, equivalent to a loss of 3 per cent! And "A Direct Importer" writes:—

"One Who Wants to Buy" in his statistics of 10th May seems to pay higher charges than is necessary. My loss in weight and draft is never as high as 3 per cent. and rarely as high as 2 per cent. I do not pay ¾ cent for shipping charges and export duty, neither do I pay more than 1½ per cent. commission, nor do I pay a commission for drawing. My total shipping and London charges on one of my recent breaks of 8670 lb. allowing 60 *cents* per pound for loss in weight, and draft 122 lb. came to just 1½d. I take it that if the ordinary common or garden planter can place his teas in London, for that sum, "One Who Wants to Buy" should be able to do it for less. Has he ever heard of such things as "return commissions"

PEARL AND CHANK FISHERIES.

The energetic Superintendent of the Madras Museum has issued a brochure of varied contents, combining a brightly written account of his recent visits to the pearl fisheries of Tuticorin and Ceylon with a more strictly scientific description of the marine fauna of the Gulf of Manaar. To these subjects he has added a general survey of Ramesvaram Island, its fauna, flora and geology, a brief note on the two pearl-producing mollusca of the Presidency other than the pearl oyster, and an account of the chank-fishery at Tuticorin. It may perhaps be suggested that the effect of these pieces is somewhat marred by their publication together and by the arrangement adopted. The reader's attention and interest is distracted by the transition from the Madras pearl fishery to the history of the chank industry and from that back again to the pearl enterprise of Ceylon. The pamphlet, as a whole, seems to lack a sufficient *raison d'être*, though the articles, considered separately, fully justify their existence. This, however, is a result attributable mainly to the absence, in Madras, of any Society devoted to Natural History whose Journal would have supplied a more appropriate medium of publication. Failing this vehicle, Mr. Thurston had been obliged to send forth his notes in their present form, and all who have read his previous writings will not be surprised to find that the result is an admixture of very readable narrative with valuable scientific record. The work is illustrated by several photographs, plans and woodcuts, and the printing of the numerous scientific names seems to be creditably free from inaccuracies. The Tuticorin pearl-fishery, to an account of which the first paper is devoted, commenced on the 25th February 1889 and, as is well-known, proved a comparative failure. Want of boats and divers and the existence of the oysters in deep water and at a great distance from the shore were the chief causes of this result, the men naturally preferring to take their labour to the rival Ceylon fishery, where the oyster bank was in only half the depth of water and was situated five miles from shore instead of ten. On leaving Tuticorin Mr. Thurston proceeded to visit this Ceylon fishery, which was carried on at a locality known as Dutch Bay, but the day after he arrived the camp was broken up, owing to the outbreak of cholera. Later in the year 1889 he accompanied Captain Donnan, the Inspector of Ceylon Pearl Banks, on his annual cruise of inspection, and gives an interesting account of his experiences. The condition of the banks is ascertained by means of divers, and in order to ensure a thorough examination the same plan is adopted as is followed by searchers for lapswings' eggs in England, viz., the divers work in a circle from a fixed centre, the distances being marked out by buoys. The oysters brought up are washed and valued by experts. After the inspection of the Muttuwartu bank it was estimated that there were 30 million oysters, worth five lakhs of rupees in revenue within an area of about 31 square miles. These oysters were of not less than five years growth, which was shown by the readiness with which they came away from the rock and were, therefore, ready to be fished; indeed, it would be little use valuing younger oysters, for so many are the foes to which they are exposed that the most promising banks

often completely disappear. On the various moot points connected with the history of the pearl oyster Mr. Thurston is able to give some valuable information. Referring to the theory which attributes the occurrence of pearls to the presence of parasitic worms in the oyster, he states that out of many hundred oysters which he examined in a few only were these worms present. He mentions that the attempts made in Ceylon to artificially cultivate the pearl-oyster have failed, but as to the causes which produced this result or which so frequently prevent the young oyster from attaining maturity, he has no certain conclusion to offer. "The life of the pearl-oyster," he observes, "must be a struggle not only during the time at which it leads a wandering existence on the surface and is at the mercy of pelagic organisms, but even after it has settled down on the bottom, where it is liable to be eaten up by fishes, holothurians, molluscs etc., or washed away from its moorings by currents; and comparatively few out of a large fall of 'spat' on a bank can reach maturity even under the most favourable conditions. Not, in fact, till a bank is thickly covered with oysters two years' old can any hope be held out that it will eventually yield a fishery."

The paper of most scientific importance included in Mr. Thurston's brochure is undoubtedly that entitled "Fauna of the Gulf of Manaar." The region thus designated is the gulf, or bay dividing the extreme south of the Indian Peninsular from Ceylon and continued eastward, after passing Adam's Bridge, by Palk Strait. Lists are given of the sponges, corals, echinoderms, crustacea, molluscs, etc., collected by Mr. Thurston, and among them is enumerated a considerable number hitherto unknown to science. As might be expected the fauna greatly resembles that of the neighbouring island of Ceylon, but in a large number of cases species which had previously been recorded from widely different regions were discovered, and their geographical range thus greatly extended. It does not appear that Mr. Thurston has been lucky enough to make any "find" of economic interest. None, he says, of the 31 sponges collected in the Gulf of Manaar are of any commercial value, and though he picked up several fragments of the red coral of commerce on the Pamban beach he seems to doubt whether they were not accidental occurrences. Among the stony corals collected he mentions one (Heteropsammia cochlea) in which a certain worm is always found living; the advantage which either animal derives from this association is unknown, but, as Mr. Thurston observes, some must exist, for a coral is never found without a goorm. A similar parasite occurred in one of the Gorwinae, the stems of which were marked by diseased excrescences, or galls, inhabited by a Cirrhiped crustacean. These excrescences were perforated by an orifice, through which currents of water necessary for the respiration of the crustacean were admitted, the stream passing constantly in the same direction. Among the fishes the most characteristic feature of the fauna was the prevalence of the so-called coral fishes, being for the most part brightly coloured species which live over the coral reefs and feed either on the small delicate marine invertebrates which swarm on the living corals, or, if their teeth are adapted for the purpose, on the soft parts of molluscs, which they extract by gnawing or boring holes in the shell.

We have not space to follow Mr. Thurston's interesting description of the wealth of animal life to be found in the waves of these tropical waters, the Medusae sometimes present in such numbers that the net became instantly filled with a thick jelly, the crustaceans rendering the surface of the water milky, the extensive banks of Alcyonians "of the luxuriant growth and size of which only a very feeble idea is obtained from specimens in Museums." Nor can we refer in detail to the very full account of Ramesvaram Island which is contained in another article. The paper on the chank fishery of Tuticorin tells us that about 200,000 of these shells, realising some R16,000 are unusually fished near the port of Tuticorin. The shells are sold by auctions and are used for various purposes, such as offering libations and as musical instruments in temples, as armlets, bracelets, and other ornaments. A right-handed chank, *i.e.* one which has its spiral opening to the right, is much prized. Such a shell is said to have sometimes fetched a lakh of rupees, and in sober fact one is stated to have been sold in 1887 for R700. Dr. Thurston's note on the pearls derived from the Mytilus and Placuna does not suggest the probability of the trade in these molluscs ever rivalling the fisheries of the Indian pearl oyster—(Avicula fucata,) but it gives some curious information on the present condition of the industry. Indeed, the whole of the pamphlet is full of interesting matter, and it can be recommended to all who want to know something of South Indian pearlfishing, or of the marine fauna of the Presidency.—*M. Mail*, May 2nd.

THE CINNAMON INDUSTRY.

Kadirana, May 21st.

The rise in the price in the cinnamon at the London sales of the 19th instant, as telegraphed by Reuter, though only ½d to 1d per lb and that on the lower sorts, is so far good news, and points I hope to a further rise at the August sales; for by then the effects of the partial stoppage of the exportation of chips should begin to be felt. Cutting for the new season has commenced on most estates; and now perhaps will arise the temptation to some—I hope there are none, who consented not to scrape chips,—to try and evade the agreement. As a rule two-thirds to three-fourths of the crop for the year is secured during the Maha Mosama, that is between May and November, and the pruning and preparation of chips finished by the end of December. Very little pruning is done before August, so that but a small quantity of chips of the new season will be exported before then. If therefore between August and next February there is a marked diminution in the quantity exported, as compared with the same months last year, it will be a proof that the agreement is being honourably carried out; if on the other hand there is no very sensible difference it will be as strong a proof the other way. I still believe that with very few exceptions those who signed the agreement intend faithfully to abide by it.

The rainfall in this district up to this morning is only 1·42 on seven days. All this has been from the north east, but this evening a heavy squall came from the south; and for the first time this year I notice the clouds scudding from the west. There are ominous mutterings and growlings in the direction of the hills, so I suppose there will be a battle soon and the south-west enter on possession for six months. It seems a strange time for trees to blossoms, but I notice many forest trees in bloom, and some in young foliage; conspicuous amongst those in bloom is the "milla" which is quite a pretty sight. The cinnamon bushes are out in "bud" which may interfere with peeling a little later on. 22nd 0·58 of rain last evening.

PAPER-LINING FOR TEA-BOXES.

Some time ago we gave a good deal of information about a specially prepared paper to supersede tea-lead for chests—being of course much lighter and cheaper. This was brought under our notice by Mr. Maitland-Kirwan who in fact, first introduced the paper into the East. Before he left this gentleman sent us a full chest of tea packed in his paper to send home to our agents, in order to test the suitableness of the new packing. This mail brings us the London report on the same. Mr. John Haddon who, of course, knows nothing

of Mr. Maitland-Kirwan or the object he has in view, writes :—

"The *tea* appeared to arrive in perfect condition. I have put up the oiled paper in a parcel to be returned to you that you may see how little discoloured it is. We could not guarantee any information on the condition of the tea in any corner or side of the case, as it was probably turned out at the Customs to get the *tare*. Anyhow the tea was perfectly dry and seemed uniformly in good condition."

This is as satisfactory as could be desired: the tea was a pekoe-souchong from Elkaduwa. Mr. Maitland-Kirwan should now make known the prices, &c.

FIRE EXTINGUISHER.

(*Taken from "Chambers's Journal," March 1st*, 1887.)

20 lb common salt, 10 lb. crude salamoniac; mix in 7 gallons water; fill into bottles and cork and hang up in a convenient place. In case of a fire smash the bottles over the fire when it will put it out at once. Strong salt and water will answer if salamoniac cannot be got.—Please put this in for the information of others.—*Cor.*

THE CONSUMPTION OF PEPPER.

It is an unmistakable fact that the demand for White Pepper, more particularly when ground, is rapidly increasing in this country, for the Ground Black Pepper caster is, unfortunately, now rarely or ever to be seen on the table in private households, hotels, or restaurants. Indeed, Ground Black Pepper is little used—otherwise than occasionally in cooking, and the chief demand for it is for manufacturing purposes. Possibly the discontinuance of the use of Ground Black Pepper may, to some extent, be due to the better colour and appearance of White. But to a large degree, the falling-off in the demand for Black Pepper has undoubtedly been caused by the miserably common, husky, and inferior qualities of it offered to the public. These inferior sorts are sold wholesale at extremely low prices, frequently even at much less than whole Black Pepper can be bought at in the open market. The poor quality and wretched appearance of such parcels have, no doubt, caused the consumer to almost discontinue the use of Black Pepper as a condiment. That this should be the case is very much to be regretted, for the pungency and flavour of the finest qualities of the entire, or Black, Pepper Corn, when ground, are much preferable to the lower qualities of White Pepper, with which the better qualities of Black would have to compete, owing to the present small marginal difference in price. In fact, good Black Pepper is not only lower in price than White, but it is undoubtedly a better commodity as a Spice.—*Produce Markets Review.*

CEYLON TEA IN AMERICA.

We have been favoured with the following information respecting the progress of the business of the Ceylon American Tea Company, Limited, by the local agents of the Company :—

(*Extracts from letters from Mr. R. E. Pineo, New York.*)

March 1st, 1890.

Our store was opened for business on the 11th ultimo, but our advertising matter was not ready until the 15th, when a portion of it was mailed to residents of this city. The fittings of the store and the two natives attract considerable attention, and many ladies come in to satisfy their curiosity who before their departure, generally buy some tea. We have arrangements perfected for giving all a cup of tea, and ladies can sit down and drink it and have a chat with us at their ease. The chairs and tables are made of natural bamboo, the walls are covered with draperies and photographs, while on the floor there are skins, rugs etc., with areca and other palms and ferns placed about. The partition in the rear, dividing the room represents the front of a Bungalow in front of which are four Electric Lights of sixteen candle power each. The fitting up is unique and original and the general finish is much admired. The store when lighted presents a pretty picture. Ladies invaraiably ask for our best tea and many will take no other. The question as to price does not appear uppermost in their minds and two dollars would be as readily given as a dollar and a quarter. The first week's sales were in proportion, as follows :—

			per cent.	
Orange Pekoe	at $ 1·25	"Bud"	66 2-3rd	}=100
Pekoe	at $ ·90	"Tiffin"	20 5-6th	
Pekoe Sou.	at $ ·65	"Bungalow"	12½	

"The Indian Association of London is opening a store on 23rd Street and its price for Orange Pekoe is $1·25 per lb. Mr. Davidson sells his 'Sirocco' tea up to a dollar a pound. I am of opinion that the ladies in the city will use our best tea and that our other grades will be sought for by people in the country. At this early stage it is not easy to judge what meed of success awaits our efforts, but it is generally acknowledged that we are moving in a direction that ought to give the best results."

"It is unfortunate that we do not, in view of your limited capital, see clearly how my visit to the Pacific Coast can, as it ought to be, be followed by action on the part of the Company. Several firms and individuals at different points, desire to become the Company's Agents, but they all want certain guarantees, consignements etc, or demand salaries. We think you may cease for a time sending pekoe souchongs, when more is needed a cablegram can be despatched to that effect. So far we have felt it advisable to postpone entering into contract for advertising and beyond our sending out 'personal' 'tea secrets' and 'you may as well begin right', our only contract is with the *Century* a copy of which paper goes forward to you by this mail. This notice appearing in the *Century* would usually cost $250 but our rate is $187.50 per month and we go in for two months certain, If we find it pay we may continue to advertise in the *Century* not otherwise."

(*Extract from New York letter dated April 4th.*)

SAMPLES.—About 100 lb. of pekoe tea has been sent out in response to nearly one thousand applications. In addition to cost of tea two cents postage on each packet was paid.

TEA SECRETS.—The number of these little booklets sent out up to the present is about 6,000.

SALES.—Up to 1st instant we sold, to about one hundred and ninety people, two hundred and thirty three packages of tea, and we believe nearly all liked it and we hope that all will prove steady customers. We have also made sales in original packages and we are striving to attract the trade to our goods, but, for some time to come, or until the consumer demands it of his grocers, we cannot look for much support from the trade.

DRUGGIST HOUSES.—One of the largest wholesale Druggist Houses in this country is considering whether or not it will handle, on a scale commensurate with the magnitude of its business, our packet teas, but a decision is not likely to be reached for some weeks to come.

MR. STANTON OF THE FIRM OF—Messrs. Gow, Wilson & Stanton. This gentleman paid our place of business two visits, tasted our teas, and manifested considerablo interst in the undertaking. He appeared pleased with the general arrangement of our store, and believes we were directing our effort rightly. He also saw Mr. Farr.

(*Extracts from letters &c. from Messrs. Wattson & Farr, New York.*)

April 11th, 1890.

We have not yet made any effort to place shares as we have been waiting for the prospectuses and articles of association, copies of which have been received this morning, we also thought it best to get the shop well under way before doing anything

Mr. Pineo keeps a separate account of all cash receipts, and sends us weekly statement. The books of the company are written up daily and are well kept by him. The demand for the tea is showing decided signs of increase, and we hope before the year is out, to have a good paying trade established in the shop. While the sales are still comparatively small there is every reason to be encouraged by the increasing interest which is being taken. All shipments of tea up to that per "Glenorchy" have been received in good order, and delivered to Mr. Pineo.

Messrs. Wattson & Farr telegraphed on May 6th that there is a fair chance of selling a large block of shares, and they asked for the firm offer of 3,500 till the end of the year. To this an answer was sent in the affirmative, and it is hoped that it will result in a large accession of shareholders and capital.

The Company's pretty "booklets for the American people" to which we referred the other day are most daintily got up: here are the contents of one of them:—

"TEA SECRETS."

American coffee is probably better than coffee anywhere else in the world *on the average*.

Tea is worse, for two reasons: first, your tea is not tea; and, second, you make it wrong.

The two secrets are: the tea itself, and how to steep it.

There is a third: good tea is in no way difficult in the brewing or uncertain in the result—you can always be sure of it—nor extravagant.

It is also easy—you can depend on it. All you have to do is to get the right tea and make it right and here is all the information you need for both.

Your money can go as far in $1·25 tea as in 50-cent tea; that is, good tea can be cheap.

THE TEA.

Good Tea does not come from China or Japan; the good teas of those countries do not come here.

Good tea is grown in Ceylon by British planters. The strongest comes from India. India mixed with Ceylon is finer than India. Ceylon alone has the finest flavor.

India and Ceylon excel China and Japan so much that they have driven half those teas from the English market.

One pound of Ceylon or India goes as far as two or three of Japan or China; and every pound of British tea displaces two or three of the native products.

The American tea-trade favors Japan and China because its connections are there.

The tea industry in India is modern; in Ceylon it is new. But the adaptation of soil and climate to tea is so good in Ceylon that that island, half as large as the State of New York, already grows nearly half enough to supply the United States.

But, so long as the American people will drink Japan and China teas, so long will those teas come; for the trade is profitable.

Ceylon is the tea then.

THE MAKING.

Make it at table. (The American notion is that making tea at table is an English notion. It isn't a notion; but that is another subject.)

Heat the pot.

Pour boiling water into the pot already hot: fresh boiling water, water that has just come to the boiling point and has not been boiling so long as a minute; pour in as much as you want.

Immediately put the tea in on top of the water and, in from two to seven minutes, pour into the cups or into another pot. Don't let it stand on the leaves much longer than seven minutes.

Use half or a third as much tea as you are accustomed to using of China or Japan tea.

Now that is exactly right. If it is worth you while to have perfect tea, that is the way to make it. There is no other.

If you are satisfied with tea a little short of perfection, steep it as usual.

We are introducing the perfect tea of Ceylon.

We are the tea-planters themselves. We are interested in your knowing how to infuse our tea to get the perfect result.

The tea-planters of Ceylon are about four-thousand. Every one of them belongs to a local Association affiliated with a central Association. They have formed this Company (undersigned) to trade with the American people.

We have the duty of getting your taste upon our tea. The way to do it is to tell you how to prepare it for the table.

THE CEYLON PLANTERS' AMERICAN TEA COMPANY, LIMITED.
No. 4 East 22nd Street, next Broadway.

Finally, the following is an extract from the advertisement in *The Century* and a form of order adopted:—

(*Extracts from Advertisements and Circular.*)

Our tea will be a revelation to you. You will say you never tasted tea before. It costs 65 and 90 cents and $1·25 a pound; but, you use so little of it, you save a good share of your tea-money—in many a family all the coffee-money.

One of the reasons why Americans drink so much coffee is that your tea is abominable. You get China and Japan teas and steep them to death. Your teas are not good; they are not so bad as they seem; you spoil them with steeping.

We bring you better tea and tell you how to steep it—a primer full of tea-knowledge.

Please send to Mrs.

No.

lb.	Bud Brand Tea	at	$1.25
lb.	Tiffin "	"	·90
lb.	Bungaloe "	"	·65
	Sample,	"	
lb.	Ceylon Coffee	"	·50

HORSE-POWER.

With the universal use of the steam engine the term horse-power has come to be very largely used, but, although its employment is so frequent and general, very many people are in doubt or ignorance of what the expression really means. Everyone knows that an engine requires a certain power or force to work it, differing, however, according to the nature of the engine. In order to measure this power it is necessary to adopt a certain standard. This standard goes by the name of horse-power. One horse-power is equal to 75 seconds-killogramme-metre, that is to say, that in 75 seconds a weight of 1 kilo. can be lifted 1 metre high, or inversely, in 1 second 1 kilo. can be lifted 75 metres high. Take, for example, an engine, whether impelled by steam, gas, or compressed air, of 6 h.-p., according to the above rule such an engine must possess a power to raise in 1 second 6 × 75 kilos.=450 kilos. exactly 1 metre high, or, to put it in another form, a working machine which requires 6 h.-p. to keep it running must be worked by a falling weight of 6 × 75 kilos.=450 kilos., which in 1 second will have fallen exactly 1 metre. If the falling distance per second be greater than 1 metre the weight must be smaller; the motor raises in 1 second 75 kilos. 6 metres high, or 6 kilos. 75 metres or 25 kilos. 18 metres high, or, putting it in the other form, the working machine is driven by a falling weight which in 1 second falls 6 metres and weighs 75 kilos., or falls 18 metres with a weight of 1 kilo. The whole of these performances would represent 6 horse-power. The power of a man is reckoned at 13-18 kilogramme-metre, according to the work required. In turning a wheel round six men are considered as equalling 1 h.-p. From this it will be perceived how advantageous is the employment of mechanical power, even when but a moderate force is required.—*Indiarubber and Electrical Trades Journal.*

COFFEE PROSPECTS.

Mr. Anton Hvistendahl in his review dated on February 19th thus summarizes the position of coffee: "Although I have every reason to believe that my estimate of the Brazil crop, 1889-90, will not be realized, I do not see that any good purpose will be served by reducing it. Assumiug that 4,500,000 bags be marketed from Brazil during the present season, we have to face, for tho year 1890, a minimum deficiency of 1,000,000 bags from Brazil, and 250,000 bags from other countries as compared with 1889. When the prospects of the next Java crop, which is reported to yield only one-third of tbe quantity harvested last year, or, say a deficiency of fully 500,000 bags are taken into consideration, the outlook as regards supply is gloomy indeed... After a very careful examination of all the circumstances bearing on the case, I have come to the conclusion that an advance of at least 10 per cent in coffee is not only necessary but imminent, and that such advance only will be maintained, but carried further, provided there hereafter should be good reason to assume that the present Brazil crop will not exceed 4,000,000 to 4,250,000 bags.—*Rio News.*

EASTERN PRODUCE AND ESTATES COMPANY, LIMITED.

COFFEE—CACAO—TEA.

(From the *Money Market Review*, May 3rd.)

The third ordinary general meeting of this company was held at the offices; 27, Clement's Lane, on Thursday; Mr. C. J. Lindsay Nicholson presiding.

The SECRETARY (Mr. Douglas R. Smith) read the notice convening the meeting and the report was taken as read.

The CHAIRMAN said: Gentlemen, in rising to propose the confirmation of the report of the second year's working of the Eastern Produce and Estates Company, the directors hope you will agree with them that the results show a marked improvment upon last year. The directors have been anxious at times throughout the year as to the results, but they are very glad that in the report now before you they are able to show that the profit for the year has amounted to £18,513 against something like £12,000 last year, and that after providing £11,749 for the payment of the interest on debentures and the preference share dividend there is a balance of £6,764 1s 10d to be carried to reserve fund in terms of the articles of association, so that the reserve fund will now amount to £7,199 15s 8d. The results have been improved by some of the produce doing better than we expected. The prices of tea, as you are all aware have beeu slightly lower in 1889 than they were in 1888, but as we point out to you, our coffee, which we really had despaired of doing very much iu quantity, has during the past year resulted so well that it has, as we state in the report, been a material assistance to the year's profits. If you kindly turn to the balance-sheet now, I will briefly allude to the alterations, such as there are. On the debit side you will find tbat the estates reserve account, realisations and rocoveries, amount to £5,050. That is a small increase, caused by tho realisation of certain machinery. The other items on that side I do not think call for any comment. On the credit side you have the amount representing landed and other property acquired at January 1st, 1888, under the agreement sanctioned by the Court of Chancery, dated October 10th, 1887, which still stands at £436,117. The outlay on tea extensions and the acquisition of land has increased to £22,747 11s 3d, and this will probably increase as occasion arises, although not very materially. The balance of the outlay for machinery and buildings is now £4,592 16s 9d. The produce on hand is £27,377 11s 9d, and while on that point I may say that really at the present moment, with the exception of a very small amount, the whole of the produce has been sold. The advances against produce and supplies for estates amount to £14,541, against £9,000 last year. I do not think there is anything else in the accounts that I have to refer to. As to the cultivation of tea during the year, you will see that the company has now 9,306 acres under cultivation, against 8,600 last year, of which about 4,700 acres are over four years old, against 3,600 last year. The yield of tea in 1889 was not quite up to our estimate, but amounted to 1,108,000 lbs., against 986,000 in the previous year, and the average gross price obtained, including purchased leaf, was 11½d per pound, as compared with 1s in the previous year. We have to ask you to join with us in thanking our representatives in Ceylon for the care with which they have brought the tea to market. We have often said that it really depends more on them than on any directions from here, and I think I may say from this side of the table that we have the greatest confidence in our representatives and recognise that they equally with ourselves are endeavouring to bring this company to a successful issue. We have to regret the death of our colleague, Mr. Stewart. If there is anything else I can add to these remarks I shall be very pleased to do so. I will now formally move "That the report of the directors, dated April 16th, 1890, be received and adopted, and that a dividend at the rate of 5 per cent per annum for the year ending 31st December, 1889, on the capital paid up on the preferred shares be declared and made payable, free from income-tax, on the 30th April." Before putting this to you, gentlemen, I shall be very happy, if it is in my power, to reply to any questions you may wish to ask.

Mr. NORMAN W. GRIEVE: I have great pleasure in seconding this resolution. I do not think our chairman has left very much for me to add, but perhaps a few words from me on the subject of the management of the estates might be of interest to the shareholders. The chairman has alluded to the great importance of having a thoroughly good and efficient staff of managers on our estates. As you may be aware, before I took my seat at this board I had the privilege and pleasure of visiting all the company's properties, and carefully reporting to the board upon them. I am, therefore able to testify to the thoroughly efficient men that we have in charge of our estates. I have had experiences in other companies besides this, and I can safely say that our men bear very favourable comparison with those of any other company in Ceylon and that I consider to be a very great advantage to us. We are also, as time goes on, building up a valuable agency business in Colombo, which we hope in course of time will be of great assistance in increasing the profits of this company. In seconding this resolution it is therefore a satisfaction to me to be able to assure you that we are doing all in our power to bring the affairs of this company to a successful issue.

Mr. C. LAWRIE said he observed that a company had been formed to search for gems in Ceylon. He would like to know whether there was any chance of any being found on this company's property. It struck him as rather an anomaly that they should have such a large balance at the bankers and have such a small amount of preference shares. With regard to the cultivation of coffee it seemed that it had nearly been given up altogether on account of the green bug, and he would like to know if anything could be done to remedy this state of matters, and again increase the cultivation of coffee, as it seemed to pay so well now. He understood that a machine had been invented to destroy the green bug.

Mr. LOWE asked what the advances against produce and supplies for estates consisted of.

The CHAIRMAN, in reply, said the directors had received information from Mr. Starey, their representative, who was at present in this country for a short holiday, to the effect that none of the Company's land was in the gem-bearing districts. They had received various offers for land, but up to the present nobody had distinctly applied for land with the idea of gem mining there; indeed, most of their land was more suited for tea than for producing gems. With reference to Mr. Lawrie's other inquiry as to the balance at the bank and why they did not pay off the preference shares, the hon. proprietor might not remember that they were bound to keep those preference

shares as they formed the qualification they were compelled under the articles of association to take. They had not issued any others, indeed they had only this small amount which really was held by the directors. If they could find out how to cure the green bug, he thought they would all consider that there was a new future for the remaining coffee in Ceylon One of the directors was at Ceylon now, and he was very much interested in the machine that the hon. proprietor had alluded to. They were always on the alert to do anything they possibly could to destroy pests. The land was now so much under tea cultivation that it would be very difficult to reconvert it into coffee, and the opinion of those who knew Ceylon well was that coffee would be a thing of the past in a very few years. As to the advances against produce and supplies from estates, it was a very profitable one, and when they merely advanced on crops, and not on block, they thought they were doing the best thing: indeed, they hoped in the future to do very well in that branch of the business.

The resolution was then put and carried unanimously.

Mr. David Reid proposed the re-election of Mr. C. J. Lindsay Nicholson as a director. It required no words of his to commend the resolution to the notice of the shareholders, and he was quite sure it would meet with general acceptance.

Mr. Welton seconded the motion, which was cordially adopted.

The Chairman returned thanks, and moved the re-election of Mr. Ralph A. Cameron, the managing director, to whose industry, intelligence, and zeal he specially referred.

Mr. Malcolm seconded the resolution, which was unanimously agreed to.

Mr. Ralph A. Cameron said he thoroughly appreciated the cordial assistance and help which his colleagues had afforded him, and they all worked with one object. He believed that the roughest part of the work was done, and that they might now look forward to the successful accomplishment of what they had undertaken.

The auditors, Messrs. Welton, Jones, and Co., were re-elected on the motion of Mr. Wilson, seconded by Mr. Malcolm.

A vote of thanks was accorded to the directors for their able conduct of the company's affairs.

The proceedings then terminated.

Process of Removing Insects from Plants.—A novel process, by Edwin P. Fowler, of National City, California, consists in dislodging the vermin and mealy-bug by means of a sandblast, which destroy yearly entire groves of Lemon and Orange trees in Florida, South California, and other tropical States. In carrying out the invention, a fan blower of any suitable construction, or any other apparatus capable of creating an artificial current of air, is employed. The artificial current of air thus created is directed against the tree or other plant, and in its transit from the fan blower to the plant, the current of air is charged with sand. Of course the force of the artificial air current must be carefully gauged, so that the sand which is projected by the same against the trees or plants will not destroy the plants together with the vermin or scale, and the sand must be sifted, so that no coarse particles or stones remain mixed with it. If the force of the air current is properly limited, according to the nature of the plants under treatment, the scale or vermin can be removed without injuring the trees or plants. In some cases it is desirable that the artificial current of air shall be heated, and for this purpose there is combined with the fan blower or other apparatus a suitable heater. It may also be desirable in certain contingencies that the sand which is used for charging the artificial air current shall be hot, and for the purpose of heating the sand before introducing it into the air current, any suitable heating apparatus may be used.—*British Mail.*

The Progress of the Gold-mining Industry in South Africa is very satisfactory, all things considered, as the following table of raw exports shows:—

First three months.	Cape Colony. £	Natal. £	Total. £
1890	309,510	116,438	425,948
1889	159,738	132,614	292,352
1888	86,820	81,429	168,249

Instead of the mining market being depressed it ought to be cheerful, but things often go contrary on the Stock Exchange. It is clear by the increased exports *via* Cape Colony that the Witwatersrand mines are eclipsing the De Kaap fields.—*O. Mail,* April 25th.

West Australia has experienced many vicissitudes in connection with the reputed gold-fields there, Yilgarn and others. A fresh spurt will be given to gold-prospecting by the publication of the annexed telegram which appears in the *Western Mail* of the 12th April:—Ashburton, April 10th.—Wilson, Ford and Pat Bresnahan say they have got one thousand ounces of gold two hundred miles from here, fifteen miles from the river. My informant saw the gold, but had no means of weighing it. There is no doubt the find is a big one. Wilson who is a practical man, says it is the richest he has ever seen. The gold found consists of nuggets and coarse gold.—*Singapore Free Press.*

The Stott Insecticide Distributor was to be seen in action in the Royal Horticultural Society's Gardens at Chiswick during the Daffodil Conference. The distributor consists of a metal cylinder, which is divided into several cells by means of perforated partitions. Into these cells the manure or insecticide, in solid or liquid form, is inserted. At each end of the machine is a length of tubing, one end being attached to the water-tap or garden-pump, and the other to an ordinary hose-pipe, and the water being forced through, becomes impregnated with the composition in the cells. The strength of the solution is regulated by the filling of one or more cells of the apparatus. A special form of spreader is fitted to the hose, which ensures a perfect spray. The apparatus is likely to prove of much service, and cannot well get out of order. An insecticide, "Killmright," supplied for use in the machine, is of a soapy consistency. The spray can be used for the destruction of such pests as green-fly, thrips black-fly, &c.—*Gardeners' Chronicle.*

Cinnamon and Coconuts.—Veyangoda, June 1st.—Some Estates have commenced peeling Cinnamon for the *Maha Mosama* or big crop, while others will commence harvesting shortly. With the rains we had last year, and are having this year, the bushes are in bud all the year through. Speaking for myself, a month of dry weather is preferable to the continuous wet we are having, for the soil is sodden and will be all the better for a bit of drying and aeration. From all I hear, some of those who declared on honour that they would cease scraping Chips seem to value their honour less than rupees. We lately heard that Chips were scraped on an Estate south of Colombo. I now hear that a proprietor of an Estate north of Colombo pocketed his "honour" with the rupees the Chips he is scraping is giving him. He too, when remonstrated with, will doubtles say that he will give orders to stop scraping. Be up and doing, Mr. Jardine, or the good work you have done will be undone by an unscrupulous few. In spite of this being the season when our largest Coconut crops are gathered, prices are keeping up. The Manager of the Desiccating Mills is the largest local buyer. Besides the 24- or 25,-000 nuts he must be consuming weekly at his Factory, our Railway store is largely occupied with the Coconuts he is forwarding to Colombo for shipment to Europe. We have heard nothing definite of the Coconut Butter manufactory that was stated to have been started in Colombo. I hope the Superintendent of the School of Agriculture has not ceased his investigations into the Coconut leaf disease. The subject is worthy of his attention. His latest contribution on the subject is nothing more than an admirable essay on the general principles of agricultural science. He has not thrown one spark of light on the subject of his Report.—*Cor*; Local "Examiner."

CEYLON TEA PLANTATIONS COMPANY LIMITED.

The ordinary general meeting of this Company was held at the offices, 21, Mincing-lane, E. C., on Tuesday; Mr. David Reid (the Chairman) presiding.

The SECRETARY (Sir W. Johnston, Bart.) read the notice convening the meeting, and the directors' report was taken as read.

The CHAIRMAN said: Gentlemen, it is again my pleasing duty to render to the shareholders an account of our stewardship, and in doing so, I can sincerely congratulate you on the present position of the Company. In three years we have paid 45 per cent in dividends, have begun a reserve fund, and have reduced the capital cost per acre of our estates by 15 per cent, without lowering the intrinsic average value per acre of our property. On meeting the shareholders I have endeavoured, on every occasion, to make a clear and simple statement of the property we have, and what it has cost us, and to give you a short history of the year's operations, showing the main features of our policy. On this occasion I will follow the same course in as few words as possible. By referring to the creditor side of the balance-sheet you will see that our property has cost us, in round figures, as at 31st Dec. last, £135,000; and by referring to the statement of acreages, you will find we have 3,726 acres of planted land and 2,720 acres of unplanted land. Our planted land originally cost us £40 an acre. I have already told you that we have reduced that by 15 per cent, viz., £6 per acre, leaving the value as at 31st Dec. last at £34 per acre for our planted land and £4 per acre for unplanted land. In addition to this we have a tea manufacturing business of over 1,000,000 lb. a year, a commission and agency business which is profitable, and a small reserve fund of £3,000. You will see from this that our position is considerably improved from last year. (Applause.) The future of the company must always be a matter of anxious care to the shareholders, and the rapid expansion of the company has no doubt arrested your attention. Of course each step in the direction of new purchases has been taken with the special sanction of the shareholders, but the directors feel a great responsibility in a matter of that kind, since the duty falls to them of marking out the general line of policy, and recommending it to your acceptance. I feel confident that in all we have done we have acted with caution, and I hope with sound judgment. You have only to look at the statement of acreages to see the drift of our policy. It may be summed up in this, that we believe in good land and high elevation. An issue of preference stock is about to be made, and, as this is an important step, it is fitting that I should say a word on the subject. The original promoters provided in the articles for the issue of preference stock, because they believed a time would soon come when we should be unwilling to issue our ordinary stock at par, and that it would be desirable to bring in a class of shareholders who look mainly to the security which a preference stock gives them. We have made the preference holders very secure, for if the company issued preference stock up to the full extent of its powers, we should only have to earn 2½ per cent on our total capital to pay their interest, and our estates would require to possess a value of less than £12 an acre to secure them. Our new purchases are made on the assumption that they will give as good a return as the old ones. If this expectation is realised, and if we continue to make the profits we have hitherto earned, or even something less, it is clear that, without diminishing our dividend-paying power, we could place to reserve the difference between the preference interest and the profit actually earned by the capital so raised; and I think this policy should be pursued until a sufficiently large reserve fund is accumulated. That is to say, if we issued the total amount of our capital to acquire more property, and earned 15 per cent on the whole as at present, we should have £8,000 a year to carry to reserve, and thus strengthen the position of the company. Since the resolutions relative to the issue of preference shares were agreed to by the shareholders, the directors have had several proposals for increasing the capital of the company under consideration, and they decided to allow the resolutions to lapse. At an early date the form in which the directors propose to deal with the issue of preference shares will be laid before the shareholders for their sanction. Our report has informed you of our appointment of Mr. Rutherford as the managing director of this company. The large expansion of the company's business rendered it essential that we should have a salaried officer with experience of Ceylon business, a knowledge of the value of Ceylon property, and the cost of work in Ceylon, always in attendance on the company's business. I am well satisfied that the shareholders have got the right man in the right place. (Applause.) The important post of manager in Ceylon has been entrusted to Mr. Talbot, who is a large shareholder in the company, and whose high character and ability are well known. It is therefore unnecessary for me to say more than inform the shareholders that I am well assured our interests are in safe hands. Our Ceylon staff continue to give the directors great satisfaction, and this year we have inaugurated a system of leave-rules on a scale which compared with other companies, is liberal, although I do not think it is too much so. Sick leave is also provided for. The estimates for 1890 are on the table, and are satisfactory, indicating quite as good prospects for 1890 as those obtained in 1889, but it has been my practice to deal only with achieved results, and to allow each shareholder to make a forecast for himself. The result will depend greatly on the price of tea and silver, and there are many here more competent than myself to form an opinion on these abstruse subjects. I may mention to the shareholders that it is the intention of the directors in future to pay only one interim dividend, probably in November, and the final dividend in May. I have now much pleasure in moving the adoption of the report and balance-sheet, and that a final dividend of 5 per cent. be declared payable forthwith. (Applause.)

Mr. HENRY TOD seconded the resolution.

Mr. H. K. RUTHERFORD: Gentlemen, the chairman has so fully entered into the various important points affecting the company's operations for the past year that there is little I can add that would further enlighten the shareholders as to our position. It might, however, be interesting to shareholders to learn that all the reports we have received from our manager in Ceylon, and from independent sources, assure us that our estates are being thoroughly well cultivated and the manufacture of our teas are receiving full and careful attention from our superintendents. It is satisfactory for me to be able to state that our low country properties, which have fields of tea eleven years old, are in good heart and bearing well, and that the historical 100 acres of that magnificent property, Mariawatte, still continue to yield 1,000 lbs. per acre. As regards cost of production, notwithstanding we charge the cost of cultivation of all young tea not in bearing to the expenditure, the Ceylon manager has been able to lay down the company's crop in London at the low figure of 6½d. per lb. and this we consider a very satisfactory performance. As to the new purchases, many gentlemen, who are shareholders, know these estates, and will bear me out when I say that from the suitability of their position as regards a favourable climate, from the general excellence of the soil, the water power available, and the advantages of road and rail communications, these properties cannot fail to prove in a very few years most valuable additions to the company's list of first-class estates. Before resuming my seat, I would desire to say a few words on behalf of our Ceylon staff, whose aid in a large measure has contributed to the satisfactory results of the year's working. Those who have been on Ceylon and Indian tea gardens know that the work of a tea planter, if conscientiously carried out, is no sinecure. He has a real responsibility and real hard work, and in many cases not over well paid. As your chairman has told you, this company has framed furlough and sick leave rules for their officers, and you are aware they have

extra to their salaries a commission on the net profits of the estate which they work, and that both superintendents and their assistants have been made shareholders in the company on easy terms. I trust, if times continue good, we may see our way to further better their position. By such like consideration for those who bear the burden and the heat of the day, we are only giving them what their valuable services entitle them to, and I am sure the confidence and reliance we have in our Ceylon staff, if we treat them well in the days of our prosperity, will not be misplaced should hard times ever fall upon us. (Applause.)

The resolution was then put and carried unanimously.

Mr. J. L. SHAND proposed the re-election of Mr. David Reid (the chairman) as a director of the company. Mr. Reid, he said, had been the great motive power of the company from its inception, and in its present successful position he did not think they could very well do without his services. He was very glad to hear the remarks that fell from the chairman and Mr. Rutherford about the improved position of the servants of the company. He had served in Ceylon himself for a good many years, and he knew that the way to secure good service was by being liberal masters.

Mr. DONALD MACKAY seconded the resolution, which was agreed to *nem. con.*

The CHAIRMAN, in returning thanks, said he gave a good deal of thought to the affairs of the company and it had always been a great pride and pleasure to be connected with it. He hoped that during his present term of office he would have as much pleasure in serving the company, and that its prosperity would be as great as it had been in the past. (Applause).

Mr. G. W. PAINE moved that the remuneration of the directors for the current year be £500, coupled with a vote of thanks for the great care they had bestowed on the affairs of the company.

Mr. G. T. WHITE seconded the motion, which was cordially adopted.

Mr. DAVID REID acknowledged the compliment.

The auditor, Mr. R. H. Miller, (of Messrs. Harper Brothers), was re-appointed on the motion of Mr. E. PRITCHARD, seconded by Mr. W. S. P. MONCRIEFF.

A vote of thanks to the chairman (proposed by Mr. L. F. Davies, and seconded by Mr. G. T. WHITE) terminated the proceedings.—*Money Market Review*, May 3rd.

TEA AND CACAO NORTH OF KANDY.

Tea in the Knuckles has been doing very well. We have no cause to complain. I guess we will collar what we were behind last year and clap it into our estimate for this.

Heard that Mr. R. Boustead got an offer of £6,000 for "Maria": but would not take it—so much for cacao property. Don't know if it is true, but that is what I was told.—*Cor.*

TEA PLANTING NOTES FROM INDIA.—Sonari, May 11th:—But little is doing in the way of leaf. There is a touch of red spider here and there, but nothing to speak of. On the 6th, we were visited by a hurricane, and on one garden the tea-house was partly unroofed. Darjeeling, May 18th:—Have had some good rain within the last week, with a great change in temperature it having gone as low as 56° whereas last week it was 81°. Snow very low down the hills for the time of year. Rainfall to date:—7·69" 1890; 12·50" 1889. Mangaldai, May 13th:—Influenza has reached this, and many coolies are down with it; but now the excessive heat has given place to genial rain perhaps it may abate; let us hope so. From the apparent apathy of the Public Works Department, one would think that they had been down with Lagrippe for the last six months, as their portions of the road are still untouched, possibly waiting for the rains.—*Indian Planters' Gazette*, May 20th.

COCONUTS AND COTTON: HAPITIGAM KORALE, May 19th.—For the first sixteen days of May we had only one shower of ·10 of an inch, but on the morning of the 17th thunder was heard to grumble in the distance, and in the course of the day and night ·31 fell. On the 18th the clouds cleared off, and it appeared as if there was to be no more immediately, but at three this morning, it opened afresh, and deposited 1·83 inch in three hours, and it looks like more, so I think I may safely write, that the big monsoon has fairly set in here. There is nothing new to report about the one product of the district, but the price of copra is somewhat unsteady, and will probably fall considerably when the largest gathering of the year (now nearly due) comes forward.—I hear of no experiments in *cotton* in the district, but one by the stationmaster of Mirigama, and I am conducting another, with less success than I desire hitherto. The climate is too uncertain to get the plants satisfactorily established, and they suffer awfully from a variety of insects, that roll up and destroy the leaves, and bore into the pods. Great sickness in this neighbourhood and labour scarce.

THE CEYLON COMMISSIONER FOR RUSSIA.—Mr. Rogivne left Ceylon homeward-bound by the "Kaiser Wilhelm II" on Monday the 12th instant. So far the Association has voted him £100 for his expenses, and £30 to be laid out in tea samples to be purchased in London after consultation with Mr. Martin Leake and others. Mr. Rogivne will travel via Genoa to London, and when in London will collect all the information possible regarding the Russian tea trade, the amount of Ceylon tea shipped for London thither, and its characteristics, so as to supply himself with samples only of such teas as may be most acceptable to Russian tastes. Leaving London thus fully equipped he will proceed direct to Moscow, which is the commercial capital of Russia, where Mr. Rogivne will interview all the buyers and importers, and, if a fair measure of success attends his efforts to push our teas upon their attention, he will probably go on to Odessa, Riga, and other centres. One thing is necessary—Mr. Rogivne should be furnished with a complete set of photographs shewing the process of tea manufacture in all its stages. These would prove of some help to him in his work, and would doubtless attract some attention from tea merchants. Mr. Rogivne is going on a mission of great importance to the colony, and we have no doubt the Tea Fund will treat him liberally, should a fair measure of success attend his efforts.—Local "Times."

TREES FOR STREET PLANTING.—Mr. William Holmes, of the Frampton Park Nurseries, Hackney, who has had considerable experience of planting in different parts of London, expresses the opinion that Planes and Poplars are much the best suited for street planting in cities and towns. He particularly recommends Populus canadensis nova, or Rumsey's Egyptian Poplar, as more likely to enable the planter to surmount the many difficulties experienced in the successful culture of trees in streets than any other. He has witnessed many illustrations of the fact, that this form of the Poplar will live and grow for years in positions where Planes will scarcely last for a season. The space in front of the London Hospital at Whitechapel affords an illustration in point. Planes were planted and died; they were renewed, and again died; when Mr. Holmes suggested the employment of this Poplar, and several were planted, with the satisfactory result that they have now stood for six and eight years, making a really splendid growth. Again at Silverton where some reclaimed land had been filled up to a depth of from 12 to 14 feet with London clay and soil, vitiated by an atmosphere charge with impurities from the many chemical and other works in the immediate neighbourhood, Mr. Holmes had an opptunity of experimenting with trees, and he found that Poplars and Ailanthus glaudulosus would alone endure; most of the others died the first season and theremainder, with very few exceptions, the second year. This is a valuable testimony, well worth the attention of planters.—*Gardeners' Chronicle.*

THE GOVERNMENT TEA GARDENS IN THE ANDAMAN ISLANDS.

By way of providing their Indian convicts at Port Blair with some employment which should prove profitable, and thereby lessen the annual expenses of the settlement, the Government of India has put down about 460 acres of tea in two estates, called respectively "Navy Bay" and "Goplakabang." The produce of these estates supplies all the requirements of the troops in Burmah—and from time to time the surplus has been sold locally, or put upon the market in Rangoon, where it appears to be rather a favourite article, selling from four and a half to twelve annas a pound. The amount of the Commissariat requisition in 1889 was 45,000 lb., and has this year risen to 72,000 which it is estimated can easily be supplied by the two gardens abovementioned. It is not necessary to discuss here the correctness of a policy by which Government interferes directly in the markets for any produce, suffice it to say that cheap Andaman convict grown tea constitutes an important factor in the Rangoon tea market.

NAVY BAY.

This tea garden is by far the larger of the two clearings at Port Blair. The first clearing was opened in 1876—and during the succeeding 6 years the acreage had risen to 152—whilst another 150 acres was opened between that date and 1887—say 302 in all. The lower boundary is the shore of the harbour—some six miles down, and it rises to about 200 feet above sea level. The lay of the land is undulating with a very small proportion that could be termed steep. The soil over the larger area of the garden is very fair as a tea soil; deep and friable —with considerable mixture of decayed cabook and fragments of quartz. Over a small extent the soil is very poor—with a large admixture of sharply broken, angular fragments of a kind of sandstone, to be seen occasionally in the patanas of Ceylon and on the poorer knolls in Avisawella district.

With an annual rainfall of 174 inches (registered in 1889-90) and within 11 degrees of the equator—the climate is admirably adapted for tea cultivation, though unfortunately "Navy Bay" is a good deal exposed to the winds which coming from the ocean almost unopposed blows very strongly in both monsoon, and this no doubt militates to a serious extent against any very great yield. The system of weeding is the one generally adopted by tea planters in India. There is no attempt at keeping the fields permanently clean, and at times the weeds are allowed to grow nearly as tall as the tea bushes, being cut down by convicts with mamoties—and the bases of the plants being forked and hand-weeded. The bushes are allowed to grow up to three feet or more and do not appear to be kept thinned out so much as in Ceylon. The managers of these estates are both experienced men who have worked in India and no doubt know what they are doing. The convict labour is paid for at the rate of R6 per mensem —no provisions being supplied by the gardens. In the opinion of the manager of Navy Bay these convict labourers do as much work as free men would, and indeed more, unless it may be in the plucking. There being no women or boys allowed on the estate, it can easily be understood that plucking by able bodied men—might well fall short of the quantity which would be done by free labour including younger hands.

The Bungalow is a two storied one built—like all the others in Port Blair—after the Burmah plan. The factory is a substantial ection of brick and tiles.

The roller—worked by hand—is one of the old type of Thompson's Challenge Roller—and though requiring a considerable power to work, it is considered capable of doing very fair work.

The jat is a good Assam Hybrid which appears to flush with more regularity than does similar bushes on the other garden which I shall notice by-and-bye.

The rainy season lasts from May to October, but the island is not subject to lengthened periods of drought such as occur in India and Burmah.

The crop of 1888-89 was something over 53,700 lb. and the estimate for the current year is 60,000 to 61,000 lb. which should pay well as the Rangoon contract is supposed to be between 9 and 10 annas a pound. The climate of Navy Bay is a very healthy one for Europeans though decidedly hot at times.

GOPLAKABANG.

The other estate on the opposite side of the harbour, though several miles from the landing place, is but little above sea level, and is situated between ranges of low hills, rising some 300 to 400 feet. The lay of the land is almost a dead level—with the exception of a recently formed clearing of small extent. Goplakabang comprises 165 acres of tea in bearing—and ten acres of new clearing.

The estate is a good deal cut up by a meandering stream and by belts and patches of bamboos and plantains, the latter being by no means advantageous to the adjacent tea plants as may well be understood in Ceylon from local experience.

The soil without doubt is better than that of the Navy Bay Tea Garden, being more friable and more free from the angular sandstone formation described above. On the slope of the valley, the surface loam is underlaid by a kind of decayed laterite, which should prove specially favourable to the tea bushes, as is indeed already observable in the one year old field, where a large proportion of the young plants already exceed three feet in height, and the whole of them exhibit a growth which I have not observed elsewhere.

The oldest tea in this garden is four and five years old and is planted five feet by five. The best fields are already pretty well covered, though topped rather high, say at three feet, and not having at first received anything like due attention.

As regards outturns of leaf, the yield for 1889 was nearly 23,000 lb. with an estimate for the current year of 28,000 lb. It must not be forgotten, however, that a very considerable proportion of the bearing area, put down at 165 acres—is detrimentally affected by the belts of bamboos &c. surrounding such small fields, and by the absence of practical knowledge of tea cultivation in the first years of its growth.

The practice as regards weeding is the same as that adopted on the Navy Bay estate, which as I have already explained is the same as obtains on most of the Indian gardens, viz. a deep hoeing after pruning and five or six light ones with mammoties followed by forking and hand-weeding immediately around the base of the bushes.

Pruning—as far as one may judge from a casual visit out of the season for that work—is not so severe as on the estates in Ceylon, but the tea being yet young it would be premature to make observations on treatment which may probably be altered as circumstances dictate in the future.

The jat on the older portion of this garden is a good hybrid, and that of the younger clearing pure Assam indigenous, which promises a larger outturn in future years.

The record of rainfall is kept from 1st April to 31st March of each year, tho register for 1888-1889 being 175·18 inches, and in 1889-1890 154·18 inches.

With the exception of a small portion which is disposed of locally—or in Rangoon, the produce of these gardens is taken by the Burmah Commissariat Department of Burmah. Tho machinery at Goplakabang is Jackson's Manual Tea Rolling machine—with a breaker and sifter. The factory is a pucka brick-building with a single roof and built with two wings as recommended by Mr. W. Jackson in his "Notes on Tea Machinery" published by Messrs. J. Walker & Co., of Colombo. The climate of this garden has not proved so favourable to Europeans as that of Navy Bay. In the hot weather a little fog creeps down the valley during the night and hangs about the garden till the sun comes over the hills, and this fog wherever it occurs appears almost invariably to bring with it malarious fever in some form or other. It is proposed to extend operations on a rather large scale in the neighbourhood of Goplakabang, there being plenty of suitable land adjoining the garden, and the present outturn of the estates being considered satisfactory. The position of the Superintendent of this property is by no means one to be envied. He is the only whiteman on that side the harbour, and his nearest European neighbour lives at a distance of seven miles of road and a mile of salt water. His men aro all convicts—not under his control, but that of the prison warder who has charge of them in Government barracks. He—is so to speak—at tho mercy of any runaway ruffian who may take it into his head to commit murder.

EDMUND WOODHOUSE.

TRADE IN HIDES AND SKINS.

Among the countries furnishing hides and skins to the United Kingdom, India takes the premier position, and the trade is yearly increasing, as the export of hides from Calcutta has trebled during the last three decades. As a fact, the trade in hides may be said to be monopolised by Bengal, while that in skins belongs to Madras, due to the fact that the total number of horned cattle is greater in the area served by Calcutta than in the area served by the ports of the Madras Presidency; while the tanneries of the latter Presidency have gained a superior reputation in the dressing of skins. Hides and skins for export are collected by the agents of the merchants who are in the trade, from all parts of India, and in the year 1889, the number of hides imported into Calcutta from the inner parts of India for export, amounted to a hundred and twenty lakhs.—*Madras Times*, May 23rd.

THE SOGAMA TEA ADULTERATION CASE.

At Worship-street, yesterday Thomas Paget and Robert Pigott, trading as tea dealers at 36 Middlesex-street, Whitechapel, appeared to summonses under the Merchandise Marks Act charging them with having sold or caused to be sold certain tea to which a false trade description had been applied, contrary to 50 and 51 Vic., cap. 28. Counsel for the prosecution said that the prosecution was instituted by an association called the Ceylon Tea Growers' Association. The article sold was tea in packets bearing tho brand of "Tho Sogama Estate." Ceylon tea bore a high name for quality in the market, and it was found that a great quantity of inferior tea was sold as Ceylon tea. It was true there was an estate in Ceylon called the Sogama estate, owned by a company having offices in Clement's-lane, City. Tho association, having ascertained that tea bearing the brand of the Sogama estate was being sold by certain persons, communicated with the company owning the estate, and these proceedings resulted. He proposed to prove the purchase and tho analysis of the article purchased, and he would show that the tea sold as "Choice Ceylon tea, a blend of Ceylon and other choice growths," was in fact a mixture of inferior China and Indian teas. Mr. Avory, counsel for the defence, said that he was prepared to admit that the defendants applied the label and that it was not Sogama tea, but he could not admit that it was not Ceylon tea. Mr. W. J. Thompson, partner with his father as tea brokers at Mincing-lane, said he had had 30 years' experience in the trade. He had had a packet of tho tea submitted to him (packet produced), and having tested it he came to the conclusion that the tea was composed of Indian and China tea. There might be some Ceylon, but he thought not. Cross-examined.—He knew there was a Sogama estate, but did not know that there was a whole district called Sogama. He understood there was not. The difference in value between Indian and China and Ceylon was about 3d. per lb. Some Ceylon tea could be bought at 11½d. per lb. He knew that the defendants were of old standing in the trade. Mr. Paget was an old friend of his own. He was not prepared to say that there was no Ceylon tea in it. Re-examined. The packets produced were ¼ lb. packets, sold at 6d. He would not expect to find tea bought at 11½d per lb. retailed at 2s. George Stehn, manager of Wilson and Smithett's tea department, Mincing-lane, said he had been in Ceylon and there was no such district as Sogama. It was merely the estate belonging to a company. The witness confirmed the previous witness's opinion as to the tea sold being mainly inferior teas of Indian and China growths. A witness named Leek, [W. M. Leake] in the employ of the prosecuting association, gave evidence showing that the packets were bought from a retail grocer who was written to and who gave up the name of the defendants as the sellers to him, the defendants being blenders of tea. The witness added that the defendant Paget called on him and said he would be willing to pay the Sogama company a royalty to be allowed to use the name on the label. Mr. Bushby asked whether such a course was usual in the tea trade. The witness could not say. Mr. Avory, for the defence, denied any intention at all to defraud. They had used the label innocently and were prepared to prove that the tea was fine tea of Ceylon growths with a blend of other growths. The defendant Paget was then called, and he said he had carried on business, since 1852. The tea in question was Ceylon and Indian tea, no China being used. It was blended from teas costing from 10d. to 1s. 1d. per lb without duty. His firm had used the label without any knowledge that they were infringing any person's right. Cross-examined, he said that the firm made two blends—the "Sogama" and the "Queensberry." He knew there was a "Queensberry estate" in Ceylon; also that there was a "Sogama," for he had purchased their tea. He supposed the owners of the Sogama estate had some rights to the name. He was prepared to admit there was no Sogama in this tea. Asked why the name of a blender was not put on the packets the witness said that tea grocers did not like the public to know where they got the teas from. ("Shame" in court.) The witness was pressed as to the cost of the tea used in the blending, but he said he was not prepared to expose trade secrets. Asked what proportion of Ceylon tea was in the blend, he said he was not willing to answer and divulge a trade secret. Mr. Avory contended he was not bound to answer. Mr. Bushby said if the question was pressed it was unfortunate that the witness should have gone contrary to the law. He and the public would draw their own inferences. The question was not pressed, Mr. Avory remarking, amid laughter, that if the witness had to state the secrets of the trade any grocer could make the blends for himself. Mr. Bushby, in giving judgment, said tho label "Sogama Estate" tea distinctly misled the public, and that was a serious evil, which must be put a stop to. He imposed a fine of £10, and allowed 25s costs. The court was crowded, and a

good deal of feeling and interest were exhibited during the hearing.

EDITORIAL ON THE ABOVE IN THE LONDON "TIMES."

The remarks in the Chancellor of the Exchequer's Budget speech on the retail price of tea are curiously illustrated in our Police news this morning. Two tea-dealers, Mr. Thomas Paget and Mr. Robert Pigott, were brought before the magistrate at Worship-street on a change of having sold tea to which a false trade description had been applied. The tea in question bore the brand of "The Sogama Estate," and it was not contented on the part of the defence that it was rightly thus labelled. What label it ought to have borne was left undecided to the last. It had been described by the vendors as "choice Ceylon tea, a blend of Ceylon and other choice growths." The first expert who was called stated in evidence that he had had a packet of the tea submitted to him, and that he had tested it, and had come to the conclusion that the contents were made up of Indian and China tea. He has not prepared to swear that there was no Ceylon tea in it, but he did not think there was any. The next witness spoke substantially to the same effect. He was confident that most of the "choice Ceylon tea" was nothing but inferior tea of Indian and China growths. Mr. Thomas Paget, on the other hand, maintained firmly that the tea which he had sold was Ceylon and Indian tea, and that no particle of China tea had been mixed up in the blend. But on the main charge he had no defence ready. He had sold tea with the brand of the Sogama Estate, and this he acknowledged it had no scintilla of a right to bear, since, whatever it was, none of it was Sogama tea. This admission was all that he could be induced to make. When he was questioned about the cost of the "choice growths" which he had used in blending his tea, his reply was that he was not prepared to expose trade secrets. On the amount of Ceylon tea in his blend he was equally reticent. It was a trade secret which he was not willing to divulge. But whatever the quality of his tea, and however much or little of Ceylon tea there was in it, it had certainly been misdescribed, and its purchasers had been thus misled. Some severe remarks from Mr. Bushby and a fine of £10, with costs allowed to the prosecutors, concluded the case.

Tea is a subject of very general public interest. We fear, therefore, that there will be widespread dismay and surprise at the amount of mystery with which the tea trade is shown to be surrounded. The object of those engaged in it seems to be to keep everybody in the dark. There are trade secrets at every stage. In dealing with the report this morning, we must begin with the wholesale tea blender, since the case in Court does not carry us any further back than this. He is unquestionably a man of mysteries. How his mixtures are made, and at what original cost he obtains the materials for making them, is his own private affair, and no one but himself is to know anything about it. His customers, the retail tea grocers, are men of like mind. They do not wish the public to know where they get their teas, and accordingly they prefer packets which have no blender's name upon them. The blender, we need hardly say, is ready to accommodate them in so simple a matter. That they object to packets with high-sounding titles upon them we are not told, and we should not believe it if we were. The evidence given yesterday at Worship-street is too clear to the contrary. But, however unwilling the defendants were to allow us a glimpse into their trade secrets, there was more than one revelation made in the course of the case for the prosecution. It was stated, and it was not contradicted, that an offer had been made on the part of one of the defendants to pay a royalty to the Sogama Estate Company for the right to use their labels. Now, such a right as this would not need to be bought and paid for if the contents of the packets corresponded with the labels outside. Sogama tea could be described as Sogama tea with no risk of a penalty under the Merchandise Marks Act. The offence charged yesterday was, not that labels had been used on which no royalty had been paid, but that there was nothing in the packets answering to the labels. We come next to the quality and cost of the tea thus misdescribed. Choice Ceylon tea mixed with other choice growths is the blender's account of it. Inferior Indian and China tea is the corrected statement on the part of the prosecution, with perhaps some Ceylon tea added, but more probably without any. We must leave our readers to choose between the two stories. They cannot both of them be true. As regards the cost of the tea, much will depend on the version which we adopt as to its quality and place of origin. We learn that some Ceylon tea can be bought at 11½d per lb. and Indian and China tea for about 3d less. If, therefore, the incriminated packets were rightly said to have contained little or nothing but inferior Indian and China tea, we may put the blender's outlay at about 8½d a pound. The price charged to the retail purchaser of the so-called Sogama tea was 2s per lb., so that there is a good margin for profit on the transaction. Mr. Thomas Paget's account was that the tea he used cost from 10d to 1s 1d per lb. * without duty. On the proportions used of each sort, and on the joint cost of his materials, he refused to say anything. Shall we be wrong in assuming that he put in the 10d tea with a freer hand than that at 1s 1d and that possibly the average cost of the whole was not greatly in excess of the lower of the two sums? This reduces the profit as shown by an adverse witness, but it leaves it tolerably high still. In the absence of complete evidence, we can come to no definite conclusions either way. The presiding magistrate, Mr. Bushby, has drawn his own inferences, but he has not told us what they are. The public, he adds, will draw theirs, so that we may be well content to leave the case as we find it, and to remain in ignorance about matters on which neither Mr. Bushby nor the public are in any need of our help.

There is one point of interest on which Mr. Bushby sought to be informed, but on which the witness for the prosecution could throw no light. Is it usual in the tea trade to pay a royalty for the right to sell goods under the name of some one else, and with no regard to the truth or falsehood of the description? Possibly, the more usual course is for the fraudulent label to be used, with no money paid for it and with no leave asked. That this is sometimes done we are entitled to say—the case on which we have been commenting is proof of it. But a deception of this kind is only possible under certain conditions. There must be at least two parties to it—an unscrupulous vendor and an unskilled purchaser. This latter condition is very commonly met. The public, as a rule, knows very little about tea, and it can be put off accordingly with very indifferent stuff. The tipplers, as Mr. Goschen terms them, have a more formed taste. For tea drinkers almost anything will do, and as long as this state of things continues there will be shops found from which they will be served with almost anything—except, indeed, with good tea, sold frankly for what it is.

* This was a misreport: these are the prices of pure Ceylon tea.—ED. *T. A.*

LIBERIAN COFFEE IN S. INDIA.

A Planting Correspondent writes to us:—Whatever may be said to the contrary by owners of specially favoured properties, I think it is generally admitted by those who have been longest at the business, and have the widest experience of districts other than their own, that the "good old times" have passed away probably for ever. Almost any planter you meet is quite willing to admit this sad fact for other districts or even for his neighbours: but it is naturally hard for a young, sanguine man to force himself to believe that he is not to be the exception that proves the rule. His property, on which a lot of money, we will say, has been laid out is just at its prime, and has been liberally manured, prices are tremendous, exchange is much in his favor, and he fondly hopes that 25 per cent. on his capital can always be made at coffee "by a man who knows his work, and does'nt mind spending a little money." But some how, generally, the crops begin to fall off in sp e of the liberal treatment, and of oven greate expenditure in manure than was ever dreamed of in old days. "Next year" like the bird in the fable leads him on until at last he gets sick and weary of it, and instead of retiring from business with a small fortune as he fondly hoped in ten years, he heaves a sigh of relief which he sees what he thinks will be his bare expenses in the form of crop set upon the trees. Of course thero are estates, even districts, which have been mines of wealth to their owners, and long may it be so. I am only writing of the *general* course of things which the statistics of ooffee exportation will I fear show to be steadily, even if unevenly downward: like an ebbing tide, alternate years being better than the one before, but worse than the ono before that. We all know what has happened to Ceylon and Java aud it is believed that America about which it is extremely difficult to get any certain information) is keeping up her figures from the yield of large new districts which have been opened up of late years.

In India the best land was taken first, and is now exhausted, or nearly so, new clearings on inferior land though opened with far more knowledge and skill, and expenditure of manure, shaded too when necessary are as a rule nothing like the old estates in quality, and not likely to last one quarter of the time. There can be but one reason for this, viz., that coffee Arabica is so deteriorated in health and strength by the continuous attacks of leaf disease during the past 20 years that, except under peouliarly favourable circumstances it is practically dying out, the only effect of heavy mauuring being to put on a new crop of leaves which are promptly swept off by our enemy as fast as they are formed. It is sadly true that instead of passing away, as we fondly hoped at one time, this pest seems now more vigorous than ever, anything like even a very moderate crop is invariably followed by a specially severe attack, and sanguine indeed must be the man who really believes that the end of vastatrix will come while there is a leaf of coffee left to feed on. We know that in Europe an almost identical fungus has attacked the vines, and in some countries utterly destroyed the old European kinds. Tho American variety, however, I am told, is now being planted with success as it is found able to grow and flourish in the ground from which the other had been dug out and burned because its constitution is sound and strong, and it is able to resist the foe. After watching the thing for some years, I have come to the conclusion that a similar state of feebleness has been brouhgt upon our Arabian coffee and that as regards low lying districts *anyhow* it will be necessary to replace it with the strong African variety called "Liberian" if we are to grow coffee at all. Now at this stage I know it will be said "why that wretched fraud was tried and abandoned long ago in tho low country of Ceylon; not only did it get leaf disease but it gave a very bad samplo of ooffee and very little of that oven. No one now believes in it." To this I reply that various sorts of bad African coffee were palmed off on the unfortunate planter at the time when attention was first called to this giant kind. These are somewhat similar in appearance at first, but are really very different to the true Liberian which is practically free from fungus (only the delicate seed leaves getting it) is a tree not a bush, a heavy cropper and yielding a good sample with no hollow beans.

Some 15 years ago I received a couple of Liberian plants from a number presented to a Planters' Association by Government. These had come out to the country, I believe from Kew direct, in a wardian case. Planted in a back garden and almost unnoticed and uncared for, they grew broad and high till now they are about 26 feet and have apparently no intention of stopping. In the evil report soon after prevailing regarding Liberian coffee, I supposed there was nothing in it till at length I began to notice that the trees were bearing very well, and that there was no trace of leaf disease. Then I planted ont 2 or 300 seedlings in a new clearing along with Arabica, and these, now 7 or 8 years old and in a more sheltered position than their parents have done even better. Planted 10 by 10 over Arabica they have now run up to 16 or 18 feet, all exactly of one type, and are bearing exceedingly well; the crop on them for this season cannot well be taken at less-than 3 lb. of clean coffee per tree. The Arabica under eath them has suffered frightfully from fungus regularly every year, yet I challenge anyone to find a sign of it on them. A few of the old leaves every year turn yellow and tumble off as was the natural way of our old staple before the days of leaf disease as I well remember before 1868. We know that Liberian coffee will grow at the sea level; the ones above referred to are at 2,500 feet in sheltered bamboo land: whether they will do well at higher elevations remains to be seen, but as far as I can see I am satisfied, and only regret that I did not do eight yea.s ago what I am doing now, viz., plant Liberian all over my clearings *with the Arabica* and let the best win. To sum up the points of difference between Liberian and Arabica I find as advantages:

1st. That it does not get fungus or only in such a way that the health of the tree is in no way affected

2nd. That it is a tree, not a bush, running up to 30 feet in height before 15 years old and in consequence is not injured by drought.

3rd. That judging by the trees in evidence and the way they go on growing, and by the fact that they do not come into bearing till 4 or 5 years old, this variety may be taken as much longer lived.

4th. That it is a heavier bearing tree when once fairly started; those in evidence now yielding 10 to 20 cwts. per acre, calculating on the clean coffee yielded, and admitting that only some 700 trees to the acre can be grown instead of at least double that number of the old kind.

5th. That being a deep-rooted plant, it is not affected by drought, while a very slight shower is quite sufficient to bring out and set the blossom; which moreover has the further advantage of fading and falling off within the day of its opening so that it is hardly possible that it can be injured by rain or hail as is so often the case with the delicate Arabica blossom. Even in the very driest season, when the other plants appear on the point of destruotion, these look cool and green and not turning a leaf.

6th. That the cost of cultivation is comparatively little. There is *no pruning to do* beyond pulling off the suckers for 2 or 3 years to prevent the tree from running up into too many stems, the crop is carried on the same wood (and extensions of it) year after year, and there is therefore no old wood to cut out. The shade of a thick, tall tree like this where they pretty well cover the ground, would effectually prevent weeds from becoming troublesome, and as the roots are deep down the debilitating effeots of weeds even if they did grow, would be very little felt.

7th. The berries (of the size of a walnut) remain firmly fixed on the tree for *many weeks* after they are ripe enough to pick, eventually they fall off, and may be gathered off, the ground. In case of a scarcity of labour this might be an advantage.

Against these good points we may set the following:—

1st. That this species gives very little return till at last the 5th year, while in low lying districts some return is got from Arabica in the 2nd year.

2nd. That the value in the London market from a sample lately sent home, is about 10 per cent lower than that of ordinary coffee.

3rd. That in Districts under the South-West monsoon, whose flowering season is in March and April, the crop instead of beginning to ripen in October and finishing in January or February, takes a whole 14 months to ripen. The flowering season is the same as the other, but though some berries will turn ripe in the following April, much of it will not be ready to gather till July. Thus the tree carries two crops at the same time, and all mixed together in the same branches. Sometimes at the end of the spring, we may see at the same time the crop of the previous season as large as plums, and partially turning red, the crop of the current season the size of peas, and a further sprinkling of the curious 8 petalled, heavily scented blossoms as large as the palm of a child's hand. All these mixed together among the large dark glossy leaves give the tree a most rich and handsome appearance.

There are now one or two points about which some information may be of interest.

Picking.—There is no difficulty about this, a notched bamboo enables the cooly to get up among the branches, and he then strips off all that is ripe, or nearly so (taking care not to rip off the small berries) dropping it all on the ground, and collecting afterwards into baskets.

It takes 4 *bushels* of these huge cherries to make one of Parchment (instead of 2 as with Arabica), but even so, the fruit being so large, a cooly can pick quite twice as much as of the other, and the cost per ton of clean, would be much the same.

Curing.—I have seen advertisements of special pulpers made in Ceylon for Liberian coffee and have no doubt that they are as effective as they are represented. Anyone growing a quantity of this coffee would have to employ machinery.

I have tried experiments on a small scale with my cherry, and found that it was no use to pass the stuff through an ordinary disc pulper (set of course very wide) because the husk never (at this elevation) gets soft enough to squeeze out below the chop but rolls up into a hard ball, and comes out with the parchment in front; and I found that when the chop was set wide enough to allow the husk to pass, the bean went with it. Moreover the work was so hard that four coolies were completely tired out in pulping 2 bushels! Then I found that the simplest way of getting at the parchment was to put it up in heaps in the pulping house *to rot*. This may seem barbarous, but the colour of the clean coffee so treated was quite as good as some treated in the ordinary way, indeed the parchment envelope of the bean is so thick and strong that it completely protects it from injury from heating. Moreover this kind of coffee will carry nothing but a dead whitey-green colour no matter how the curing may be done. If allowed to dry in cherry some heavy peeler might perhaps break it up, but it seems to me as hard and tough as the very best road metal, and I much doubt whether a coffee curing firm would undertake it on the usual terms.

As regards the drinking qualities of this variety, I can safely say that no one who had not previously been told would know that he was not drinking the pucka article, the same quantity of powder goes further and I cannot notice any inferiority of quality. Unsuspecting guests have often said "may I have another cup of this excellent coffee" and they usually look somewhat surprised when told what it was. If you try to sell it in the hazaar whole and clean (looking something like date stones in shape,) natives decline to buy it. "This one kind bad imitation coffee" they will say, but if you smash it up and mix a little dirt with it they will take it readily, and never find out the difference.

Planting.—Owing to the seedling throwing out a strong, deep, tap root something like that of a jack tree, I am inclined to think that when a pantation has to be made it would be better to have lthe pits made ready by May, and then to put one or more seeds in each pit as early in the South-West monsoon as possible, so that the seedlings may get established before the end of the North-East monsoon in December. But if not grown to any great size they can be lifted with a little special care from nurseries in the ordinary way. Considering the fact that Liberian Coffee does not come into bearing till 2 or 3 years after the other, it may probably be a wise plan for one going in for its cultivation, to pit his clearing 4 by 4 and to plant *Arabica*, afterwards putting in the giant kind down every other row, making them thus 8 by 8. The Liberian is much too robust to take any notice of its little friend, while by the time it has come into bearing you may safely assume that the Arabica has given what it can in maiden crops, and unless heavily manured has already made arrangements for returning to a better world where there is no fungus.

It is said that the civilised but effete nations will one day (when magazine rifles are common) have to yield to the iron constitutioned African, who can more than hold his own physically, and multiply in any climate, and here shortly we may perhaps see our poor old worn out King, eaten up with disease, and quite unable to do anything but keep himself alive, deposed in favour of his strong and healthy African cousin. I shall be delighted at any time to show the trees on which my experience has been gained to any one who takes an interest in the subject, or to give any further information in writing. Enclosing my card as a possible means of communication.—*Madras Mail*, May 10th.

THE INDIAN TEA EXPORT SEASON it will be seen from our special telegram, elsewhere, has closed with a total of shipments to all quarters of 103,642,000 lb. This is about 3½ millions below the estimate for the season, which stood originally at 106,941,160 lb.

THE "SISAL HEMP" PLANT is a native of Mexico, and Dr. Trimen does not think it has been at any time introduced to Ceylon; it is therefore very unlikely that anyone should have seen it growing in the N. C. Province, as our correspondent Mr. F. Cummins supposed he had. But who is to be first to try the plant on a considerable scale, and still more who is to follow in the footsteps of Mauritius planters, in utilizing local aloe fibre and making shipments to try the market on a considerable scale?

THE VICTORIA REGIA in the "Gordon Gardens" has not only flowered and fruited, but is reproducing itself in an immense number of self-sown seedlings which Mr. Nock—who is in town for a day or two—describes as perfectly healthy. These seedlings will be available for distribution o applicants who will take the trouble to experiment with them. The seed in future might be scattered in the Lotus pond, near Skinner's road, and over other pieces of water in or near Colombo, in the hope of spreading so notable a plant in our midst.

CINNAMON.—A discovery has been made which shows that the love of our ancestors for drinks spiced with cinnamon was fully justified. What were not the Dutch ready to do to procure cinnamon and other spices for their mulled wines, and what wonders of navigation did they not accomplish in their lumbering vessels in order to fill the spice-boxes of their housewives? According to the Paris correspondent of a contemporary, Dr. Chamberland, M. Pasteur's chief assistant, has just discovered that cinnamon is fatal to the typhoid microbe, which must infest the sluggish waters of the Netherlands. This will be news for cinnamon growers.—*H. & C. Mail.*

JAMAICA.—The last *Bulletin* of the botanical department contains articles on the culture of Coca Erythroxylon) Coca), and on the abandonment of Orange culture in the Azores, due to a disease ("gumming"), and to the unremunerative prices obtained by the growers, Other articles refer to the manufacture of Lemon essence in Sicily, and fruit-candying in Italy.—*Gardeners' Chronicle*.

IN the Queensland Botanic Gardens, Rockhampton, which is under the Tropic of Capricorn, as a curiosity in the adaptability of plants, I may mention that last week we had Pine-apples and Apples gathered from the same bed, the Apples are small, but well flavoured. A few days ago, a station owner out West told me there was a species of Ipomea (I. calabra, tuberous rooted) growing in the scrubs on his station used as food by the blacks; he describes the flowers as deep purple, and promised to have some of the tubers taken up, and sent down the first chance. We are having a grand season here. I would like you to see how things are growing with us at present.—J. S. EDGAR, Rockhampton.—*Gardeners' Chronicle*.

COMPARATIVE SALES IN LONDON OF INDICA, CEYLON AND JAVA TEAS.—From the figures in Gow, Wilson & Stanton's circular, for packagee brought to auction in the 11 months from 1st June 1889 to 2nd May 1890, it will be seen that while Javas decreased by 18,462 packages and Indians increased only 87,685 on 1,012,634 packagee, the increase in Ceylons was almost 100,000, the exact figures being 99,997 increaee on 345,255 packages. Taking percentages, Ceylon is very far in advance of India,—an increase in our case of about 30 per cent, against about 8 per cent for India.

A NEW FLOWER.—The latest *Field* gvies the description of a flower which would appear to be admirably suited to adorn our Indian gardens in winter:—" A new plant, that seems to have a great future before it, is Gerbera Jamesoni, and from what we have seen of it, both in this and last season, it should become of use in private gardens. It flowered in the Royal Gardens, Kew, last June, in the cool house; but a plant was also tried in the border, and gave great hopes of this Transvaal wilding as a hardy plant for the border. It was found by Mr. Jameson, near Barberton, in the Transvaal, and to Mr. Tillet belongs the honour of first introducing and flowering it. The leaves are of the richest green, hairy on the under side, and arranged in a rosette way, the flowers each about 4 in. acrose, and borne singly on a etem about 12 in. high. The shape is distinct and striking each petal being narrow, and the whole so arranged as to form a large star, the colour of which is orange scarlet. Even if not of sufficient hardiness to stand the winter, it will make a useful pot plant for the greenhouse, as not much heat is required."—*Pioneer*.

PLANTING TREES IN TOWNS.—Some time ago Mr. Robert Walker, the efficient and hard-working keeper of the Victoria Park, read a couple of papers "On the Planting of Trees in Towns." The papers were interesting, and fitted to be extremely useful; Mr. Walker's own experience in planting trees along the margins of streets and in other urban localities being considerable, while his information on the subject, including the choice of proper varieties according to locality, character of soil and surroundings, &c., is extensive. We are now glad to see the papers, as "revised by the two Aberdeen members of Mr. Ruskin's Guild of St. George," issued in a very neat and attractive form, with some eight choice tree illustrations showing on plate paper examples of the Silver Birch, the Horse Chestnut, the Lombardy Poplar, the Spruce, the lime, the Oak, and others. We commend the print to the attention of all interested in the highly commendable work of improving the amenities of the city.—*Aberdeen Free Press*, May 3rd.

ARTIFICIAL GEMS at the Paris Exposition are said to have surpassed anything ever before shown, some of the specimens puzzling even dealers and experts. The artificial pearls were especially successful, no means being found to distinguish the genuine from the artificial except the use of a file.—*Fiji Times*.

LONDON PURPLE.—A correspondent in Kent who has damaged his Apple trees by using the above substance with water in the proportion of one to twenty, thereby following the instructions given him by the firm which supplied it gratuitously, is much to be pitied. The safer proportion would be one tablespoonful of London Purple to one gallon of water, for use on trees in leaf.—*Gardeners' Chronicle*.

THE MANGO SEASON.—Those of us who have been looking forward to the mango season cannot but be disappointed at the poor specimens of this year's crop which are everywhere being offered for sale. We are, most of us, under solemn promise to our friends "to be sure to send them some good mangoes," and, though we would fain escape the mild vituperations and covert innuendoes of "pie crust promises" &c., which are sure to fall on our devoted head until we pledge ourselves more deeply for the future, we feel that we cannot send them the wretched things that are offered to us as mangoes. For the lover of the mango likes his mango good; a good mango is something to remember. It is as Mr. Elphinstone, the historian of India, says, the best Indian fruit, at once rich and delicate, and all other fruits are comparatively insipid beside its intensity of taste. There is something in it, which is nothing less than voluptuous.—*Madras Times*, May 23rd.

SILK.—In a review of the trade in silk for 1889, the *Weekly Mail*, an English journal of Yokohama, observes that this industry is becoming more important every year. New plantations are laid out, new filatures and re-reeling establishments are started, new firms and companies begin business, swelling the volume of the trade, and constant improvements introduced into the growing and reeling of silk are making the Japanese product more popular with manufacturers in Europe and America. Not only are "Japan raw" and "Japan waste" becoming universal favourites with the consumers of the world, but the goods woven in the Japanese looms are finding their way to Europe and America, where the beautiful fabrics of artistic Japan are greatly appreciated. In 1889 the great staple export, raw silk, figures in the returns for the large total of 40,808 piculs (of 133 1-3lb. each) valued at $26,332,900, as against 46,963 piculs, valued at $25,899,700, in 1888. In the month of June, when all attention was given to the harvest, a partial failure of the crop in Italy turned special attention to Japan. It was then believed that the Japanese export would be greater than that of any previous year and would amount to 50,000 piculs; but in the result neither the cocoon crop nor the autumn crop of *bivoltini* turned out as satisfactory as was anticipated. The export of waste silk, including pierced cocoons, was 27,915 piculs, valued at $2,509,500, against 34,382 piculs, valued at $2,794,700, in 1888. The trade in manufactured silks grows year by year. Large factories, with new and improved machinery for warping, winding, weaving, and dyeing, are being constantly erected, and the industry is fast developing in Japan. The United States is at present the best customer for these goods, but England, France, Germany, Canada, and Australia are rapidly entering the field as competitors in the purchase of these fabrics. At the present rate of progress, the value of woven silks exported will soon exceed the value of the tea annually shipped from Japan.—London *Times*.

THE ECONOMIC USES OF LEAVES.

Of the three divisions of Nature's products, man is most chiefly indebted to the vegetable kingdom, whether for his food, medicine, or domestic comforts. Every part of plants and trees is more or less utilised by savage and civilised men, and a common category might be furnished by the various uses of the separate parts—the roots, stems, sap, bark, fruit and seeds, and leaves. If we take the last-named, the foliage, apparently the most insignificant part of the plant, how dependent are we on these for food, clothing, medicine, dyes, stains, and various comforts.

The miscellaneous application of leaves for different purposes as domestic appliances, and for manufacturing uses, of themselves, would furnish a long list; some few of these we may pass under notice, because their adaptability and usefulness are mainly confined to tropical countries. It is true that some leaves have been utilised by the papermaker, as in those of the dwarf Palm, Maize leaves, and others, but this is only on a small scale.

The leaves of many Palms are largely employed for making hats. Those best known are Panama hats, so named from being shipped from that port. These are made from the finely-plaited fibre of the leaves of a South American Screw-pine (Carludovica palmata). These hats are much prized for wear in the Tropics, being light and flexible, and can be washed and bleached repeatedly. The tree has no stems, the leaves have long slender petioles, springing from the ground; they are some 2 feet long, fanshaped, and four-parted, each segment being again ten-cleft, so that when folded in venation, each segment on its own rib, there are eighty layers in a young leaf. The tree occurs only on the slopes of the Andes. About 200,000 dozens of these hats are made in Ecuador and different States of South America. These hats are distinguished from all others by consisting only of a single piece, and by their lightness and flexibility they may be rolled up and put in the pocket without injury. In the rainy season they are apt to get black, but by washing with soap and water, besmearing them with lime-juice, or any other acid, and exposing them to the sun, their whiteness is easily restored. The plaiting of the hats is very tedious and troublesome; the coarse ones may be finished in two or three days, but the fine ones take as many months to plait. It commences at the crown, and finishes at the brim. The hats are made on a block, which is placed upon the knees, and requires to be constantly pressed with the breast. The hats vary in price, according to fineness and quality, from 20*s*. to as many pounds.

The unexpanded fronds of Livistonia australis, prepared by being immersed in boiling water, are dried, and the fibre thus obtained is much valued for the manufacture of hats in Australia, which much resemble the celebrated Panama hats.

The rough leaves of the Chumico (Curatella americana) and of Davilla lucida are used for cleaning iron, and polishing and scouring wood, Curatella alata is used in the West Indies for polishing bows, sabres, &c.; and C. sambaiba in Brazil—indeed, they serve all the purposes of sand-paper to the Indians for polishing their blow-pipes and war clubs. The leaves of Celtis orientalis are used for polishing horns in the East Indies.

The foliage of Guiacum officinale is very detersive, and is frequently used in the West Indies to scour and whiten floors, which it is said to do better than soap.

Leaves sown together are much used in India as substitutes for the plates and dishes of more civilised life. It is not always poverty that leads natives to use them in preference to metal or porcelain articles, as caste or custom has often some influence in the matter. The leaves principally used are those of the Egyptian Lotus (Nelumbium speciosum), Bauhinia species, Semecarpus anacardium, Butea frondosa; those of the Banyan (Ficus bengalensis), by Brahmins, and the Plantain-leaf (Musa paradisaiaca).

The leaves of Bauhinia Vahlii are used in the construction of the curious, rude leaf-bellows in Sikkim with which the natives of the hills smelt iron. These leaves, when sown together, are used as plates, cups, rough tablecloths, rain-hats and caps. The leaves are heart-shaped, and above a foot in breadth, and the same in length. Sewn together with twigs, they also serve for baskets for holding pepper, turmeric, and ginger, and are likewise used for thatching.

Under the name of "Chattahs," a kind of umbrella-hat or sun-shade is made in the East of the leaves of the Licuala peltata and the Talipot Palm, or a Plantain leaf. These Chattah hats are much worn by the ploughmen, cowkeeprs, and coolies of Bengal and Assam.

The large fan-shaped leaves of the Talipot Palm (Corypha flabelliformis) are like those of the Palmyra Palm, carried over the heads of people of rank as an umbrella, and are also used for making books, and for various domestic purposes. The leaves are also cut up into neat bracelets, worn by Santal girls in India. Those of Vanda Roxburghii, split, are also worn by them as anklets. Those of another species, Borassus æthiopicus, occur as much as 12 feet across; they serve also for the manufacture of baskets, mats, ropes, and sieves. The leaves of Nipa fruticans attain a height of 15 to 20 feet, presenting a very handsome appearance, resembling the fronds of huge Ferns. This graceful Eastern Palm is utilised in various ways, the principal being in the manufacture of thatching for house-roofs, in the East called "Ataps." This manufacture is quite an industry of itself, and affords employment to many natives, chiefly women, the men simply bringing cargoes of the fronds to the women, to be stitched with split rattans, and made up. Atap roofs are the best adapted for these climates, for while the winds are never strong enough to blow them away, they afford the coolest protection against the sun of any kind of roofing konwn.

The leaves of the Palmyra Palm (Borassus flabelliformis) were formerly used like paper, to write books on, and to this day they are applied to this purpose in Orissa, Southern India, and Ceylon, where an iron style is employed to write upon them; in certain parts of Bengal young children use them to write the alphabet lessons on. They are largely employed for making pans, bags, winnows, hats, umbrellas, and for thatching, &c. The leaf takes a dye well, and is worked up in Madras into pretty coloured patterns in baskets and mats.

The slips of Talipot and other Palm leaves are coming into European commerce for the manufacture of ornamental braids, and in the construction of straw, or Leghorn hats. The fibre obtained from the base of the leaves of the Chusan Palm (Chamærops Fortunei) is used by the Chinese for making hats and coarse clothing. The sale of Palm leaves for decorative purposes in the towns of Elche and Alicanto in Spain, produces a considerable income to the towns.

Kadjan mats, manufactured out of Nipa leaves, are indispensable for travelling purposes; packed up in the smallest compass when not required, each mat is capable of affording sufficient cover at night for two or three persons, either in boat or forest journeys. They also form, almost exclusively, the material for side-walls and divisions within houses. The young leaf unfolded and dried, under the name of Roko, forms the favourite covering for cigarettes in the Malayas Peninsula in preference to paper.

The large leaves of the Teak tree (Tectona grandis) are used for plates, for packing, and for thatching. The leaves of Cordia myxa are employed as plates in Pegu, and to cover Burmese cheroots. In Bangalore the leaves of Canna indica are used by the natives in lieu of plates, to serve their Ragi or Millet puddings and other dishes on.

The leaves of the Papaw tree (Carica papaya) are employed by the negroes in washing linen, as a substitute for soap. They have also the property of rendering meat wrapped in them tender, owing to the alkaloid papain which they contain, and which acts as a solvent.

For cordage and other textile purposes, numberless leaves are used, and they serve very generally for packing and wrapping up small parcels in India

In Guiana, Tibisiri fibre is obtained from the inner surface of the spiral leaves of the Ita Palm (Mauritia flexuosa); it is used by the Indians for making hammocks, &c. The leaves are cut before they are open and the midrib separated by drawing each division of the leaf through the finger and thumb. After drying, the fibre is ready for use without further preparation. About a quarter of a pound may be procured from each leaf, and if the central leaf is left uninjured, no evil effect is produced on the tree. Bags or matting could be cheaply and easily made from this fibre, as well as hats, similar to those known as Panama.

The foregoing is only a brief enumeration of some of the many uses to which leaves are industriously applied.—P. L. SIMMONDS.—*Gardeners' Chronicle*.

MARSH-PRODUCED DISEASES.

It is not every one who has a proper conception of what malaria means and really is. Malaria really means bad air; but for some reason, difficult to define, it has been restricted to the emanations from swampy districts. For example, a man who has fever and ague (or, as it is known among professional men, intermittent fever) is said to be suffering from malaria; whereas a man suffering from the noisome effects of sewer-gas in his house is assuredly the victim of malaria, though not suffering from intermittent fever. The fevers, then, and the ailments following in their wake, that are produced in districts where there are warmth and decaying vegetable matter, are said to be malarial.

Malaria is a hydra-headed disease. Even that one form of it, "fever and ague," presents itself in various forms. It occurs most frequently in newly-populated districts; and in lands from which it has been supposed to have vanished it has been reproduced when their soil was turned. A man who has suffered once may suffer again, after a score of years, by simply running down in health. It may appear first as a chill, followed by intense fever, which, in its train, is followed by a sweating stage. It may appear simply as an intense neuralgia, and it may be noted that the most frequent form of malarial neuralgia appears over the brow, and is known as "brow ague." As if there was some similarity, distant, no doubt, between paludal fevers and sewer-gas poisoning, it may be noted that neuralgic symptoms characterize both, and quinine certainly seems beneficial to both.

Formerly, quinine, and, indeed, all the cinchona preparations, were more appreciated than they are at present. In the whole range of medical treatment nothing ever is encountered which is more wonderful than the action of quinine in malarial fevers. With its administration the diseases disappear, and that quickly. No doubt the dwellers in old countries and the residents of old towns would derive great benefit from a far freer use of quinine; and here we should take occasion to point out that the ordinary sulphate of quinine, the form usually used, is objectionable; it irritates the stomach, is quite insoluble, and is frequently not all absorbed.

The soluble quinine Tabloids are the best preparation, inasmuch as one of them dissolves in a little water the minute it touches it. They do not irritate the stomach, can be taken without the taste being perceived, and none of the drug is lost in the system. Those suffering from enervated health, whether from sewer-gas or marsh emanations, overwork, worry, sleeplessness, or any of the thousand ills that go hand in hand with civilization, will find quinine useful—more useful as a tonic than any of the myriad drugs that glut the market.

Under ordinary circumstances a two-grain Tabloid is sufficient. In malarial troubles as much as twenty grains should be taken in a day.—"*Health*," London.

TRINIDAD COFFEE.

The Royal Gardens, Kew, to Colonial Office.

Royal Gardens, Kew, April 1889.

Sir,—With reference to my letter of the 7th April, 1888, forwarding a Report on samples of Trinidad Coffee prepared at the Botanic Gardens by Mr. Hart, I am desired by Mr. Thiselton Dyer to inform you that he has recently received further specimens of Trinidad Coffee from Mr. Hart, consisting of Arabian and Liberian sorts in cherry, parchment and cleaned.

2. Mr. Hart has taken considerable interest in promoting a Coffee industry in Trinidad, and in these efforts he has been judiciously supported and encouraged by His Excellency Sir William Robinson.

3. It must be very gratifying to all concerned to find that during the interval since the last samples of Trinidad Coffee were submitted to Loudon Brokers, a considerable improvement has taken place in the preparation and curing of the beans, and there is no reason to doubt that Trinidad Coffee could eventually be established as an article of Commerce on the same footing as Trinidad Cacao.

4. I have pleasure in enclosing a copy of a Report by Messrs. Wilson, Smithett & Co., furnished through Messrs. Shand & Co., on samples of Trinidad Coffee just received from Mr. Hart, and Mr. Thiselton Dyer will be glad if the information contained in it is communicated to Sir William Robinson so that it may be rendered accessible to those who are interested in Coffee growing in Trinidad.

I am, &c.,
D. MORRIS.

Description of Samples of Coffee from Trinidad Botanic Gardens.

1. Parchment. Grown in Santa Cruz—Propared in Gardens.
2. Liberian. Grown in Gardens—Prepared by fermentation.
3. "Creole" *C. Arabica*. Grown and prepared by Machinery in the Gardens.
4. Pea-berry. Picked from above.
5. Parchment Coffee. Grown and prepared in Gardens.
6. Mocha. Grown and prepared in Gardens.
7. "Creole" *C. Arabica*. Grown at Santa Cruz—Prepared in Gardens.
8. Venezuelan Coffee, selling in Trinidad at 20c. per lb. or 83s. 4d. per cwt., retail.
9. Trinidad Coffee. Grown at Santa Cruz—Prepared by fermentation. Dr. Chittenden's.
10. Trinidad Coffee, dried in Cherry. Mr. Fitz Simons, considered fairly good by our Cocoa planters.
11. Montserrat District Coffee. Won 1st prize against all others, San Fernando.
12. Hybrid Mocha. Grown and prepared in Gardens.

Report on Samples of Coffee from Royal Botanic Gardens, Trinidad, By Messrs. Wilson, Smithett & Co., No. 41, Mincing Lane, London, E. C.

1. In parchment of rather dull uneven colour, and this appears to be shewn also in the berry when the outside shell is removed. Considerable importations from various countries have taken place of Coffee in this stage, and a loss of 16 to 20 per cent. takes place in preparing it for market—allowance for which loss is made by Customs. Value about 75s per cwt. as it is, if London cleaned it would realize about 90s per cwt

5. In parchment brighter and apparently better dried. the berries after shelling being also superior to No. 1, 78s per cwt. If London cleaned, about 93s per cwt.

2 Liberian, browner than the usual importations. of Ceylon Liberian. A yellow colour is preferred. The berry is of good size. 78s per cwt.

3. Flat boldish berry of dark colour with a tendency to fading. This is dullish and more nearly approaching some Central American kinds than Ceylon. 90s per cwt.

4. Pea-berry of uneven colour and too much mixed with split and ragged berries to command sale in Eastern Europe, where high prices are paid for even colory pea-berry. We doubt if this prepara-

tion would command a price that would compensate for the separation from the flat berry. Fine pea-berry is worth 110s. 90s per cwt.

6. Of small size, fairly even colour similar to small East India, would command a ready sale probably for admixture with Mocha, the berry being of that character. 92s per cwt.

7. Similar to Ceylon in shape of berry of fairly even colour, but dull and rather faded. 92s per cwt.

8. Pale yellowish and greenish, similar to LaGuayra. 83s per cwt.

9. Dull green pale of undesirable appearance and mixed with brownish berries which seem to have undergone slight decomposition which would make the liquor what is known as "unclean." 75s per cwt.

10. Brown and black berries, apparently over ripe. 60s per cwt.

11. Pale greenish rather uneven in size, similar to Salvador. 85s per cwt.

12. Good hard coated of fine colour and wellgrown. This would command a ready sale both for exportation and for home use, and has much of the character of high grown Mysore or Neilgherry Hills, 98s per cwt.

The liquor of all except Nos. 9 and 10 is good. No. 2 has the coarse African flavour which is never entirely eradicated.

WILSON, SMITHETT & Co.

Memo. from Superintendent Royal Botanic Gardens to Colonial Secretary.

Sir,—The Coffee samples to which the Secretary of State's communication relates are those which were on Exhibition at the Annual Show of Naparima Agricultural Society.

1. It will be seen that the Hybrid Mocha, as last year, maintains its superiority over all other samples.

2. There is an evident inferiority in all the Coffee prepared by fermentation. No. 1 and No. 9 being the same Coffee and from the same district, but the latter prepared by fermentation (No. 9) and the former by machinery (No. 1.)

3. The advantages of shipping in parchment are shewn with much force.

4. The value of the 1st Prize Coffee at the Naparima Exhibition (San Fernando) is estimated at 85s per cwt., while the value of No. 12 Hybrid Mocha, shewn against it, is given as 98s a difference of 13s per cwt. The decision of the local Judges is therefore reversed. Again, the Creole (No. 9) which took second prize at San Fernando is valued at 5s per cwt, over the Montserrat Coffee which was awarded 1st prize.

This of course shews that the value of the Coffee has been judged by different standards, but which is most reliable, is for growers to judge.

5. "Pea-berry" Coffee generally occurs in all classes of Coffee, and simply arises from the fact that one ovule if fertilized in the flower, instead of two, as is normally the case. The Broker's Report does not appear to favour any attempt to separate these berries from other samples.

6. Our Liberian Coffee is very favourably reported upon, and at the prices quoted, certainly deserves full attention. One important fact in connection with this variety is that the Coffee, after being ripe, will hang on the trees for several months without deterioration, and thus allow the grower to choose his own time for making his harvest.

7. The smaller yield of No. 6 would prevent any idea of its competting with such prolific kinds as No. 12, Hybrid Mocha.

8. The Report should be an inducement to planters to give the industry a fair trial upon the improved lines of culture and preparation.

CINNAMOMUM CASSIA.

With Notes on the Collection of the Bark, from Mr. J. Humphreys.

Mr. J. Humphreys, recently a student of the Society's School of Pharmacy in Bloomsbury Square, on leaving for China a few months since, promised to send for the Museum of the Society the implements used by the Chinese in collecting and trimming cassia bark. Mr. Humphreys has now sent them, and says in the letter accompanying them—

"According to our Chinese manager the mode of collecting the bark is as follows:—

"Transverse cuts are made round the branch or stem, which is only of the size of one complete quill (viz., about an inch in diameter) at distances of about a foot. Then two longitudinal cuts are made right down the stem on each side. This is readily peeled off, and when thoroughly dried presents the appearance of the sample. The chopper-like knife is used for most of the work. The other, a kind of spokeshave, which resembles a plane in its action, is merely to shave off the corky layer or periderm."

He then adds:—

"Our Chinese manager tells me that 'by far the best cinnamon' never gets to Europe and grows wild in a place in Annam. He tells me it differs altogether in appearance from Ceylon cinnamon, being in fact larger than cassia bark. The Chinese pay large sums for it."

I may now point out that until as lately as the year 1884, the exact botanical source of cassia bark was not known with certainty, although it was generally attributed to the tree which is now proved to yield it. The attention of the Colonial Office having been directed to the matter by the authorities at Kew in November, 1881, Mr. Charles Ford, the Superintendent of the Botanical and Afforestation Department at Hong Kong, was sent to the cassia plantations on the West River to procure living and dried specimens of the plant. These he succeeded in obtaining, and on November 16 the result of his investigations was brought before the Linnean Society of London by Mr. W. T. Thiselton Dyer. The information then made public has been already published in this Journal, vol. xiii., p. 584.

Mr. Dyer remarked at that time that although the cultivation of the *Cassia lignea* tree has been carried on in Southern China, it does not appear to be indigenous there. In Cochin China, however, there appears to be some probability of its being wild. He also quotes Mr. Ford's statement to the effect that very thick cassia bark is sometimes obtained from the trees of ten years old and more, which are reserved for producing seeds to supply the places of the small trees, cut down every year, the ordinary trees being cut when six years old.

These statements throw some light upon Mr. Humphrey's remarks concerning the thick cassia bark from Annam, so that it appears probable that the bulk of the thick cassia bark used in China is obtained from wild trees in Cochin China, small supplies only being obtained from the cassia districts in China, when the older seed-bearing trees are cut down for any reason. The exact part of Cochin China where the cassia tree grows wild is mentioned in 'Pharmacographia,' 2nd. ed., p. 320, as follows:—

"The French expedition of Lieutenant Garnier for the exploration of the Mekong and of Cochin China (1866-68) found cassia growing in about N. Lat. 19° in the forests of the valley of the Se Negum, one of the affluents of the left bank of the Mekong, near the frontiers of Annam. A part of this cassia is carried by land into China, while another part is conveyed to Banghok in Siam."

A specimen of the thick cassia bark so highly valued by the Chinese exists in the Hanbury collection of Materia Medica.

There are two other points in connection with cassia to which I may now direct attention.

1. Mr. Dyer remarks in the paper read before the Linnean Society (*Journ. Linn. Soc.* 1884, p. 23) that *Cinnamomum Cassia* is botanically closely allied to *C. obtusifolium*, Nees, one of the species from which a similar product is obtained on the Khasya hills in India There are specimens of the bark of *C. obtusifolium* in the Museum of this Society from the collection of the late India Museum, received from Kew when the distribution of that collection was effected. This bark differs entirely from that of *Cinnamomum Cassia* in its distinctly fibrous character and in the remarkable coriander flavour it possesses, thus adding another to

the many well-known instances in which botanical similarity is dissociated from chemical and structural likeness. It is these curious exceptions that render it so difficult to lay down rules concerning the properties of any one natural order or genus of plants.

The Bark of *Cinnamomum obtusifolium* some years since was met with in the London Market, and there exists in the Museum of the Society a specimen obtained at the time which had been moistened by steam and bleached with the vapour of sulphurous acid, and was then offered for sale as cinnamon.

The coriander taste of this bark is very marked. Now in 'Pharmacographia' (p. 530) the authors allude to a variety of cassia "vera," occasionally found in the London market, which has a flavour more or less of cinnamon, often with some unpleasant addition suggestive of insects of the genus *Cimex*. This seems indicative of similar chemical changes taking place in this bark to those occurring in the coriander plant, the leaves and unripe fruits of which possess a most offensive odour of a cimex character and quite different from the agreeable fragrance developed in the ripe fruit.

2. I wish to direct the attention of members of our Society and of botanists living in the East to the elucidation of the botanical sources of the several barks so frequently met with in the London market under the names of *Cassia vera* and wild cassia, and which probably come to this country from Batavia, Singapore, Calcutta and Manilla. These barks as a rule contain more mucilage than cassia, the cold infusion made from them giving a thick glairy liquid affording dense ropy precipitates with acetate of lead, but not with alcohol ('Pharmacographia,' 2nd ed., pp. 527, 528, 530).

OIL OF LAVENDER.

With Observations on the Cultivation of the Plant and the distillation of the Oil, by Mr J. C. Cawer.

In the year 1885 I directed attention to the tentative cultivation of lavender and other medicinal plants at Brighton by Mr. J. C. Sawer. He has now presented specimens of the oils distilled from lavender and rosemary, and thinking that he might possibly be able to add something to the already recorded facts concerning lavender, I asked him for any additional information* that he might be able to afford.

In reply Mr. Sawer says—

"A mild damp winter like the present one does more harm to lavender plants than a hard seasonable frost, as the plants are apt to make greenshoots prematurely, and late frosts nip off these tender portions, each of which would otherwise have produced a flower spike.

"It is necessary to grow the lavender sufficiently far part to allow of ready passage between the rows, as he plants soon spread their branches, and it is otherwise very difficult, without injuring the plants, to carry the crop of flowers, if required for distillation. The collection has frequently to be done rapidly when the flower is arrived at a certain stage of maturity, and dry weather must be selected for the work. When the plant once begins to flower the blossoms are shed rapidly, and in damp weather the spikes carry much water and loose fragrance.

"Some florists in Sussex cultivate a variety of lavender for 'bunching' (*i.e.*, selling in the streets), and they set the plants close together, and the rows also close together. The plants are not so liable to break or split from the stem, in this case, but it is almost impossible to manure the plants or to collect their blossoms without injury.

"The flowers deprived of as much stalk as possible should be distilled, *without previous maceration*, the same day as cut, and not left in heaps, as the flowers rapidly ferment and the character of the oil is quite changed. The still and copper basket employed for rosemary can be used, but of course the condenser and receiver should be different. The receiver should be deep, as the particles of oil passing into it are much samller than rosemary. If a shallow receiver they might be carried down into the water pipe. The use of the perforated basket is twofold: 1st. It enables the operator to pull out the charge clean, all at once, without 'drawing' the fire, so that the still is ready for a fresh charge. 2nd. It is most important to prevent the flower from scorching by contact with any part of the still. While the basket is being refilled the dirty water is syphoned out and fresh water let in at the same time by a pipe smaller than the syphon, but admitting enough to prevent the copper burning.

"The complement of water is run through the lid of the basket when that has been replaced. The supply of cold water to the condenser must be plentiful, so as to keep the lower half of it always cold. Nearly all the oil will have passed over in half an hour from the time the mass thoroughly commenced to boil; the rest is a heavier oil. The water passing over with the oil should not be returned to the still; the very small quantity of oil saved by doing so would not compensate for the herbaceous flavour communicated to the next running.

"The sample herewith (made as described) is clear, limpid, and pale in colour. It may probably be improved by drying out of it any particles of water held in solution.

"It is said that some consumers add 10 per cent. of S. V. R. to oil which they may have to keep in store, but I find if it be added to *new* oil, in which may remain any traces of water, a peculiar etherification sets in, the odour of which is very unpleasant.

"Mr. Cripps, of Birmingham, has kindly undertaken to examine samples of oil with a view of obtaining analytical data for comparison with other samples of the same oils; as, for instance, the iodine and bromine absorption equivalent, effect of age, etc.

"Of course tests for adulteration are known, also methods of taking the specific gravity, boiling point, etc."

* See Pharm. Journ., [3] xvi., p. 125.

INDIAN DRUGS.

The following specimens have been presented by Dr. W. Dymock, of Bombay, and the information concerning them is taken partly from Dr. Dymock's letter and partly from his work on the 'Materia Medica of Western India.'

Clerodendron infortunatum and C. inerme.—In the leaves of these plants Mr. D. Hooper has detected a bitter principle, and an acid which he identifies with chiratin and ophelic acid. This discovery is the more remarkable, since chirata belongs to the Gentianaceæ, and clerodendron to the Verbenaceæ, these natural orders being very distinct. The leaves of the *Clerodendron infortunatum* are mentioned in the Pharmacopœia of India as an efficient tonic and antiperiodic, and are said to be used as a vermifuge. The leaves are cordate-ovate, 8 to 10 inches long and 7 to 8 inches broad at the base, hairy and dentate at the margin.

Those of *C. inerme* are much smaller, being only 1 to 2 inches long, oval, smooth and dotted on both sides with dark green dots. The leaves of this species are used as a febrifuge in intermittent fevers.

Alangium Lamarkii.—The root of this tree (which belongs to the natural order Cornaceæ) is used in leprosy, syphilis, and skin disease. It possesses emetic, diaphoretic and antipyretic properties, and is, according to Mr. Moodeen Sheriff, a good substitute for Ipecacuanha in all diseases except dysentery.

Casearia esculenta.—The root of this plant is stated by Dr. Dymock to be of great repute in Goa in cases of hepatic disease and hœmorrhoids. Attention has already been directed to the drug in this country in a paper by Dr. Mootooswamy read at the British Pharmaceutical Conference (*Pharm. Journ.*, Nov. 1889, p. 377).

Chloroxylon Swietenia.—The bark possesses astringent properties, but does not appear to be much used in Indian medicine. The tree yields the Satinwood of India.

Kyllingia monocephala.—This little Cyperaceous plant is given as an antidote to poison. It possesses aromatic properties.

Herpestis Monniera.—Dutt states that this plant is considered to be a nervine tonic, and as such is useful in insanity and epilepsy. Ainslie says that it is diuretic and aperient and is serviceable in cases of dysuria accompanied with constipation.

Adiantum lunulatum.—Used by the Mahometans of India as a substitute for the ordinary maidenhair of Europe, and is employed as a deobstruent and resolvent.

Jatropha glandulifera.—The oil of the seeds of this plant is used as an application to ringworm, chronic ulceration, etc. An account of its properties was published in the *Journal de Pharmacle*, [3], xl., p. 16.

Calotropis gigantea.—The flowers of this Asclepiadaceous plant are used in cough, asthma, catarrh and loss of appetite. The bark of the same plant is used as an alterative, and is said to promote the various secretions of the body, and hence to be useful in skin disease, dropsy, etc.

Asafœtida.—The tears sent are stated by Dr. Dymock to be the largest he has ever seen.—*Pharmaceutical Journal.*

REPORT ON THE ROYAL BOTANIC GARDEN, PERADENIYA, NEAR KANDY.

(*By the late Dr. W. C. Ondaatje, Acting Botanical Superintendent, 1st June 1843.*)

(*Continued from page 9.*)

Myristica Officinalis, Linn.—The nutmeg is now covered with flower and fruit, and I have been already able to raise a pretty good number of seedlings (about 180) from the ripe fruits.

The nutmegs are of an excellent flavour.

Caryophyllus Aromaticus, Linn.—Clove trees are likewise growing remarkably well, and are all at this moment in full bearing. A vast number of seedings have been obtained, and there are still a great many available at the Garden.

Amomum Cardamomum, Linn.—Cardamom plants are found here growing since the days of Mr. Moon. The Cardamom they produce is of an excellent quality, and I have no doubt will always find a ready market.

Eugenia Pimenta, D. C.—Allspice succeeds well.

Melaleuca Cajuputi, Roxb. Croton Tiglium, Linn.—Melaleuca Cajuputi, a well known and useful medicinal plant grows remarkably well, and has been introduced into this Garden from the Hon'ble Company's Botanic Garden, Calcutta. Croton Tiglium, Linn., a native of this Island, promises to be of much medicinal use, if only extensively cultivated,

Janipha Manihot, H. B. K.—Janipha Manihot, a plant from which the *Tapioca* is made, thrives well here.

Datura Stramonium, Linn.—Datura Stramonium, (In Singhalese, *Ratta atana*, *Rata* signifies *foreign*) grows in the Garden remarkably well, and I have seen several plants in the neighbourhood of Kandy growing *wild* with much vigour and luxuriance.

Theobroma Cacao, Linn.—The Chocolate plant grows exceedingly well, and with very little care:—Seedlings also of this plant shoot up spontaneously about the Garden; its beans, when prepared like Coffee, make an excellent drink, so that the well chosen name of "food of the gods" by which the illustrious Linnæus has designated it, holds good in the case of our own plants.

Vanilla Aromatica.—The sweet Vanilla is found in Peraderia on some of its noble hills; but I am sorry to state that it does not thrive so well in the Botanic Garden, as in its own locality.

West Indian Yam (Arum Sp.)—"West Indian Yam" grows abundantly in the place, it is excellent in quality and if only known as it ought to be, it will, I think, supersede the potatoe.

Mauritius Sugar Cane, Coffea Arabica, Linn.—It is very easily cultivated. Mauritius Sugar Cane grows well. I merely allude to this as it is a well known fact in this country. Several portions of the Garden are covered with Coffee plants, most of which are now in full bearing, and all applicants are *most liberally* supplied with seedlings.

The Coffee is most excellent in quality and equal to the very best kind.

Sanseviera Zeylanica.—Among plants producing vegetable fibre, the Sanseviera, Zeylanica, Linn. is deserving of particular attention, as it yields a very strong and durable cordage.

Sago and Date Palms.—The Sago and Date Palms grow well here, but as Ceylon is a country which is so remarkable for its fine majestic Palms, I need perhaps hardly notice the circumstance.

Tobacco.—I have recently succeeded in raising seedings from the *Jibelee* and *Rowsa* Tobacco seeds kindly given to me by Dr. Williiam Griffith, the able Superintendent of the Honble Company's Botanic Garden, Calcutta.

3. *The Improvements I have been effecting.*—In the third place I beg leave to call His Excellency's attention to the improvements I have been effecting. One of the first things, to which my attention was called after I had taken charge of the Garden, was the putting in order the cultivated part, which I have almost succeeded in accomplishing.

I am also engaged in collecting chiefly from the jungles, the greatest number of species of inidigenous plants and arranging them, *as far as practicable*, according to the "Natural Order," a system of great importance in every Botanic Garden, but which does not appear to have been generally adopted here.

It would seem however from the regular arrangements, of some plants, that the late Mr. Moon conducted his operations, to a certain extent, according to the Linnæan system of classification.

One great advantage of *collecting together native plants* will be the opportunity which will thus be afforded of examining and ascertaining, with the greatest facility and precision, their various properties and qualities, and it is perhaps the more necessary to do this, as I have good reasons to believe that this Island contains many plants which may serve the purposes of Commerce, and the Technical Arts, and be used as Mordants, also in Medicine.

Appropriation of a piece of ground as a Medico-Botanic Garden.—Considering the greaty utility of indigenous medicinal plants, and encouraged by certain works recently published at Calcutta and Madras, on the subject of Indian Botany and Materia Medica, I have devoted an extent of 5 acres of land for such plants.

There are not a few drugs of this country that may be substituted for those of Europe, which are costly, difficultly obtained, and very often are found to be inert from having been kept long.

A few instances in proof of this observation may here be adduced. The Hemidesmus Indicus, R. Br. is an excellent substitute for the Sarsaparilla, nay I am bound to say (as I have known its virtue practically) it is even to be preferred to the Sarsaparilla itself. In India this is extensively used with success, and the opinion of the Faculty in Calcutta is much in its favor.* Witness again the bitter tonic,† Cocculus Cordifolius, D. C. In Plumbago Zeylanica, Linn. a plant of this Island, we have a blistering

* By desire of the Medical Board of Bengal, the Hon'ble Company's Dispensary has been supplied with 13½ maunds of the root of the Hemidesmus from the Calcutta Botanic Garden.

Hemidesmus indicus, in Singhalese *Irmus*, in Tamul *Nannare vair*, in Bengalle. *Annate Mul.*

† This may supply the place of the *Quassia.*

agent; add to these the Convolvulus Turpethum, Linn. (Ipomea Turpethum, R. Br.) Croton Tiglium and Hebradendron Gambogioides of Professor Graham, which are useful Cathartic Medicines. Observe likewise the Strychnos Nuxvomica, Linn. a most formidable poison found abundantly in the jungles, but a valuable remedy in paralysis, rheumatism, neuralgia, &c. Many others may here be enumerated; but it is not necessary to do this on the present occasion.

I cannot take leave of this subject without inserting the just remark of the learned Professor Lindley, who observes, "No one will be bold enough to assert that the Physician already possesses the most powerful agents produced by the vegetable kingdom; for every year is bringing some new plant into notice for its energy, while others are excluded because of their inertness. In tropical countries, where a fervid sun, a humid air, and a teeming soil give extraordinary energy to vegetable life, the natives of these regions often recognise the existence of potent herbs, unknown to the European practitioner. We are not altogether to despise the experience of natives less advanced in knowledge than ourselves, or to suppose because they may ascribe imaginary virtues to some of their officinal substances, as has been abundantly done by ourselves in former days, that therefore the remedical properties of their plants are not worth a serious investigation; or that their medical knowledge is beneath our notice, because they are unacquainted with the terms of modern science."

Nursery established.—In order to possess the means of making more liberal distribution of plants, seeds, &c. to applicants, I have commenced, on a small scale, a Nursery, which, I beg to remark, is a very useful accessory to Botanic Gardens in India; for as my honoured Preceptor, the eminently learned Doctor Wallich, has justly remarked "From the absence of the facilities which exist in Europe, the Botanical Gardens in India are obliged to unite in themselves the Offices of Botanist, Gardener, Nurseryman and Seedsman."

Garden divided into Departments.—It thus appears that the Garden at present comprises the three following divisions:—

1.—Plants interesting in a purely *Botanic* view.
2.—*Medicinal* plants, chiefly natives of this country, to ascertain their true medicinial virtues.
3.—A *Nursery*.

With a view of obtaining an ample and faithful collection of plants of this Island, I *intend forming* an *Herbarium*, having duplicate specimens (if possible more) of such plants; which may be eventually disposed of in a manner the most advantageous to Botanical Science.

Measures necessary for the advancement of the Botanic Garden.—I have now in conclusion to suggest a few measures for the advancement of the Garden.

The *first* thing necessary to be done, is *clearing* the extensive portions of ground, which are now overgrown with jungle, and of course perfectly useless for any Botanical or Horticultural purpose, which, it must be evident, will require more laborers than are at present employed, as it would prove but mere fruitless effort to attempt such a work with those I have now in the Garden.

The establishment may however be reduced, as soon as the useless exuberant vegetation in the place is *destroyed*, and the Garden well laid out and duly organized.

I beg also to bring to his Excellency's notice the necessity of employing *two additional men* on the fixed Establishment for the Nursery, whose sole duty it will be to practise Horticultural operations under my superintendence.

In training these men for their work, I shall endeavour to adopt the excellent principles and practice laid down by Professor Lindley in his *able* work on the "Theory of Horticulture," a book which deserves to be more *extensively* known here than it is at present.

An additional *Plant Collector* is likewise highly necessary, I would say indispensable, to make proper collections of, and prepare plants for the Herbarium. There is at present but one plant collector.

The climate of Nuwera Ellia being so much allied to that of the temperate parts of the globe, and the vegetation on and around its hills resembling that found in those parts; I would respectfully suggest to His Excellency the Governor the establishment of a little experimental garden there in order to naturalize the most useful plants of Europe. I have been led to make this suggestion from having been kindly allowed access to Captain Champion's collection of plants made during his little excursions into Nuwera Ellia and Adam's Peak, where I find several plants, natives of a cold climate.

The Receipts of the Garden remitted to the Government Agent for the Central Province, from February to May inclusive, amount to £8 9 10½, viz:

viz:	£.	s.	d.
February	0	19	0
March	0	11	0½
April	1	7	10
May	5	12	0
Total	£8	9	10½

The expenditure of the Garden for the same period amounts to £150 19 7½, viz:

Fixed Salaries.

	£.	s.	d.
For February	16	4	10¼
" March	24	14	6
" April	24	14	6
" May	23	19	6
Total	£89	13	4¼

Incidental Contingent Salaries.

	£.	s.	d.
For February	8	9	4¾
" March	15	8	6¼
" April	17	7	11¾
" May	20	0	4½
Total	£61	6	3¼

Amount voted by the Legislative Council for the Botanic Garden, £500 per annum.

Herewith I beg leave to forward an interesting paper entitled "Remarks on the state of Botany in Ceylon with reference to the knowledge of it in April 1843, and an attempt at arranging its Flora, as known to Moon and resident Botanists, according to locality and elevation, commonly called Geographical distribution of a Flora, by Captain Champion, 95th Regiment." (Vide Appendix B.)

WM. C. ONDAATJE,

Actg. Botl. Superintendent.

Royal Botanic Garden,

Peradenia, 1st June 1843.

(Appendix to be given.)

THE EURASIAN COLONY IN THE MADRAS PRESIDENCY.

The *Pioneer* writes:—

The President of the Anglo-Indian and Eurasian Association, Mr. Gantz, last year described the Eurasian colonies of Whitefield and Sausmond, the creation of the energy of the late Mr. D. Starkenburgh White as the *magnum opus* of the Association; but it is to be feared that, while they cannot with justice be said to be altogether a failure, they have been far from attaining the success or fulfilling the purpose their founder expected and intended. At the time of the inception of his scheme Mr. White stated that his object was "to settle Eurasians on the soil, to lead them into agricultural pursuits, and to remove for ever the feeling of anxiety as regards their future and that of their children; and again, in 1886, he declared his aim to be "to send the able-bodied destitute, old and young, only as labourers to be fed and paid, leaving it to them to rise by good conduct to the level of settlers: to send persons of slender means to carry on trades of various kinds, giving them each an acre of land: and to send persons of sufficient, yet moderate, means to farm, giving them allotments of land extending to twenty acres." Mr. White's idea, in short, was to found a self-contained community of Eurasians, consisting of three classes, agricultural, industrial and labouring, from which outside competition should be entirely excluded. The vision was fascinating, but like other dreams of idyllic communities it took too little account of the infirmities of the men on whom success depended and on the working of economic law.

What has really happened may be gathered from a very sympathetic description of a visit paid to the colonies last autumn by Lord Connemara, the writer of which is Mr. Rees, who has already given us so many agreeable narratives of a similar sort. The first view of the settlement at Whitefield was not calculated to excite enthusiasm. "It had not," says Mr. Rees, "a very flourishing appearance. Some of the cottages were moderately neat, but in no case had any settler apparently the time or inclination to cultivate the Graces. In the neighbouring town of Bangalore the bungalows and verandahs are generally covered with orange bignonia, violet petræa, various thunbergias and a wealth of convolvulus; but the Whitefield settler has not called them to his aid, and the village has a somewhat bare and unattractive appearance." Nor did personal converse with the settlers themselves serve to prove that the actual condition of the colonists was belied by this uninviting exterior. The oldest settler in the place said his lands had never paid him. He had had some capital and had come there expecting to make a living, but he had hoped for help from the Association which he had never received. The cattle were not strong enough for improved ploughs, and the ground was not good enough for large crops. Very similar was the story of a more recent settler—always the cry for external help: and the most cheerful accounts came from a colonist who did not reside in the village at all. The artisans and the able-bodied destitute, whom Mr. White pictured leading a frugal and contented life among members of their own race, were apparently nowhere to be seen. The only real success had been attained by persons with moderate capital who reared pigs and poultry and cultivated fruit.

From all this there seems to be but one conclusion possible. For the Eurasian pauper or even for the person of slender means Mr. White's scheme has done nothing, and in the nature of things could do nothing, for both classes are beaten at every turn by the native labourer and the native cultivator, and the idea of excluding competition was from the first chimerical. Pensioners, who have accumulated a certain amount of capital are in a rather better position, though even they can hope for success only by leaving the ryot in secure possession of his own ground and turning their attention to fruit growing, arboriculture, and the like pursuits. In a word Whitefield and Sausmond have given to those who already had; but they have not, as their founder expected they would, provided the less fortunate members of the Eurasian community with a means of livelihood; nor is there any reason to believe that their educational value has been greater, or that the experiment has developed that spirit of energy and self-reliance the lack of which is the worst defect in the Eurasian character. The case, Mr. Rees remarks, is one for kindly criticism and a helping hand; but he is at the same time quite uncertain whether the colonies will reach old age or even adolescence. Is this really to be taken as the *magnum opus* of the Eurasian leaders?

AGRICULTURAL AND INDUSTRIAL ASSOCIATION OF FIJI.

SUGARCANE.—The acreage under this product during the past year has been from various causes, considerably reduced. The floods in the early part of last year not only destroyed large areas of cane which would, under ordinary seasons, be now turned into sugar, but deprived the soil of all fertility for some months reducing that which had escaped the floods to a mass of green unripe canes at the time most favourable for cutting and reaping.

On the Ba the returns so far have been satisfactory if report is to be taken as a guide.

BANANAS.—This product of the colony not only rivals the former but from a commercial point of view far exceeds it in importance to the colony. Your committee are within the mark when they say in reference to this product of the colony, that but, for its considerable extension, the colony would be in a very much worse condition than it is now. Notwithstanding the exactions levied upon this product from the ships outwards, the area under cultivation has been largely increased. The export value of this product for last year, was about £42,000, and there is no reason why it should not be more than double, and at remunerarative prices to the grower. Care and attention has been latterly bestowed upon the cultivation and selection of fruit for the market and when this has been done the disease has not made much headway. There is as yet no specific for this disease. Baron von Mueller's recommendation is in one or two particulars impracticable: first too expensive; second, of too dangerous a character to be entrusted to irresponsible persons. The other particulars are valueless being too weak to destroy the fungus.

The exports of fruit for 1889 were, Bananas £42,525. Pineapples, about £2,500.

It is said that if the banana plantations of the entire tropical world were utilised as they ought to be, the market would be flooded with a textile material that would quickly influence the value of such rivals as hemp, flax, cotton and jute.

COPRA.—For the last year or two nothing but disaster appears to have overtaken this product. Hurricane succeeding hurricane, attended with a very slack market and low prices.

Your committee, however, trust that an immunity from hurricane may be experienced by those depending upon a crop of this product for this year and the next. Prices have lately advanced a little.

Exports 1889, £39,158 12s 4d.

COTTON.—Your committee are of opinion that in cotton cultivation on a small scale remains a profitable experiment, where the climate is suitable. The kidney variety has been grown for the last two years under Government supervision with marked success; and, whilst there is no danger of overdoing or overstocking the market with this article of commerce, they would recommend the planting of an acre or two where the land is available. There is no tangible reason why cotton should not become one of the staple products of the colony; and, through the Planters and Fruit-growers Co-operative Association, the product could be delivered direct to the manufacturer, leaving a very fair margin of profit to the grower. That this latter suggestion is practicable we have evidence in the recent action of the Lancashire manufacturers and operatives in support. Rather than submit to the cotton ring in Liverpool the operatives elected short time and semi-starvation to support their

employers to break down the ring, which tbey ultimately did. A revival of the cotton industry is contemplated in Queensland, where the previous failures were similar to those of Fiji, not the actual reduction in prioe of cotton, but the charges of the middleman was the cause of failure in both instances. The wool trade of Australia is undergoing a similar metamorphosis. The continental manufacturers are getting a particular kind of wool direct from South America to escape the London brokers &c. and instead of buying so largely in London now of Australian wools, they send their buyers to Australia. Care, however, should be exercised in the selection of the variety of cotton to be grown, to suit soil and climate.

Export 1889 £787 19s 7d.

TEA.—This article of production still maintains its character of excellence. There has, however, been no addition made to the area under crop. Upon suitable labour supply depends the extension of the area or being able to compete with more favored countries in this respect.

Export 1889 £1,459 1s.

COFFEE.—It is a matter of regret that this article has all but ceased to be produced.

Export nil.

RICE.—Your committee are proud to say that, quite unexpectedly, it has been brought to their notioe that about 20 acres of land is now planted with rice at Rewa, and, when visited by the President, looked vigorous and strong and promising a heavy crop.

FIBRE PLANTS.—It will be interesting to you to known that at last a machine has been invented to decorticate and prepare Ramie fibre for the chemical operation, which appears to be a necessity before the fibre of this plant can be used as a textile fabric. Ramie in the ribbon state is worth about £18 per ton. The author of a paper read before the Franklin Institute says of it "I will call it by no scientific name; I will simply name it as the richest of all plants, for it possesses wealth of growth, wealth of development and wealth of fibre; in ordinary light ground with a little watering now and then by rain or irrigation, no plant will grow so rapidly, no root will multiply more quickly and produce more stalks, no vegetable fibre is handsomer, richer, or more silky than Ramie." It is a perennial and when once put in the ground it grows for over twenty years without replanting and according to climate gives from two to four crops a year. There are from 10,000 to 16,000 plants in one acre giving in crude fibre dry 1,6000 lb. or 700 lb. bleached fibre per crop, and as there would be three crops at least in Fiji the return per acre would be from £36 to £40.

Your committee regret the matter of paper making fibre, which was taken up by a committee specially appointed, has so far eventuated in nothing, not even in ascertaining the value of the fibres sent home as samples, and they believe that there is a profitable investment for the necessary capital to establish a paper mill in Fiji.

Exports fibre, 1889, £98 13s. 6d.

TOBACCO.—During the past year, tobacco, like maize, had to be imported to supply the demand. There is no country in the world better adapted for the growth of tobacco than this colony and the Associatson should be in a position to introduce an expert to cure the leaf fit for any market in the world, on getting a legal guarantee for a certain area and under conditions of mutual arrangement.

COCOA.—This valuable produot has not as yet asserted for itself that position which it deserves, but it is pleasing to note that one or two have planted out a few trees and in a short time it is hoped that, though in small quantities, it may figure among the exports of the colony.

LABOUR.—This most important question is at the present moment in a more satisfactory condition than for some years past.—*Fiji Times*, April 16th.

RUBBER.—A New York contemporary states that there are more than 120 rubber manufacturers in the United States, employing 15,000 hands, and producing annually 280,000 tons of goods, valued at $200,000,000.—*India Rubber Journal.*

THE FAILURE of the attempt made by the Indian Tea Supply Co., Ld., to popularise tea among the nativea of India, was probably a foregone conclusion. There is nothing more difficult, says the *Statesman*, than to induce people to consume as food what they have previously been accustomed to regard as medicine; and this is the light in which the people of India, in common with the French and the Italians, have always looked upon tea. Cheap, again, as the lower qualities of tea are, the cost of the beverage, as an article of ordinary diet, would be quite disproportionate to the scale of native expenditure among any but the wealthy.—*M. Mail.*

COOLIES FOR FIJI.—Early in April, 1,100 Indian coolie labourers were expected to arrive at Fiji for the service of the Colonial Sugar Refining Company, and eighty-nine Polynesian labourers have been allotted to them. This certainly looks as though they intended extending their operations in this colony. There is some talk about forming an agricultural department in the local administration, and its advocates declare that it is the only panacea for the present depressed state of affairs. Considering that the Government are now really trying to encourage the introduction of fresh capital and enterprise by offering unoccupied lands for lease, and publishing pamphlets on suitable agricultural products, it can hardly be expected to form in addition an agricultural bureau, at the expense of an additional $2\frac{1}{2}$ per cent *ad valorem* on drapery.—*Indian Agriculturist*, May 10th.

GREEN TEAS IN THE COLOMBO MARKET.—We omitted to call attention to the fine average price realized by Mr. Drmmond Deane for his Kintyre Green teas at the last public sale held in Colombo. The teas were sold by Messrs. E. Benham & Co. and realized the following prices:—

Kintyre—	66 boxes	660 lb.	1c.
	54 boxes	1,080 lb.	[illegible]6c.
	14 ½ chs.	74 lb.	59c.
	25 boxes	532 lb.	49c.
		3.056 lb.	64c. average.

Considering that tbis parcel includes the whole of the bulk, except 2 per cent of dust and 1 per cent of Congou, the average obtained, viz. 64 cents, is very satisfactory, and we take it is higher a good deal than would have been obtained for the same teas manufactured in the ordinary way.

HORTICULTURE IN COSSIPORE.—Babu Hem Chunder Mitter's Practical Institution of Horticulture, Floriculture, and Agriculture at Cossipore is a standing testimony to the enthusiastic pursuit of botany and gardening by a Bengali, and a gratifying instance of natives being trained in a profitable and pleasurable calling through the efforts of one of their own countrymen. The magnificent show of fruits and flowers at Seven Tanks, last February, demonstrated the success of Mr. Mitter's Institution as a nursery where scientific principles are both tested and practised. We now learn from the Annual Report how much quiet work of the most endurable kind is being accomplished at the same institution. Eight native students, undergraduates of the University, were admitted during the year, to be supported and educated free till they know enough to hold responsible positions in public or private gardens, or in connection with zemindari lands. Further, among a number of interesting experiments which were conducted with genuine enterprise, not the least hopeful were those with indigenous fibres. The result of these was to prove the groat superiority, in strength and durability, of the fibre of the "Abel Moschus," a hibiscus scientifically known as *Malachra Capitata*, which is common in India in the rainy season.—*Englishman.*

BOMBAY ALOE FIBRE.

The following correspondence given in the *Bombay Gazette* of the 14th instant is of local interest in connection with the recent discussion in our columns. We suppose, it will require tea to fall a little lower, and the labour supply to undergo a very considerable increase, before some practical attention is given by our planters or merchants to the work of developing a trade in superior fibres such as those which are sources of so much profit in Mexico and the Bahamas.

The following correspondence is sent to us for publication:—

Letter from D. Morris, Esq., to J. A. Godley, Esq., C B., India Office, S. W., dated Royal Gardens, Kew, 14th February.

With reference to my letter of the 21st February 1887 and subsequent correspondence on the subject of Bombay aloe fibre, I am desired by Mr. Tbiselton Dyer to inform you that the specimens of plants from India, advised in your letter of the 21st ultimo, have been duly received at Kew.

2. These specimens confirm the fact that the Bombay aloe fibre of commerce is prepared from the leaves of Agave vivipara, L., an American species of agave now widely distributed throughout the sub-tropical and tropical parts of the old world, and some parts of India. From the interesting report of the Officiating Director of Land Records and Agriculture (Bombay) we gather that the fibre is extracted by certain depressed castes of natives by crude and destructive methods, and that so far no attempt has been made to cultivate the plants. They are chiefly used as hedge plants and are "nowhere at present in abundance."

3. It is evident, however, that plants exist in Bombay in sufficient quantity to supply several hundred tons of fibre received in this country. After a consideration of the facts noted below it might be found advisable to cultivate this species of agave on waste lands in Bombay entirely for the sake of its fibre; or the Sisal hemp plant (Agave rigida var. Sisalana) might be introduced on a large scale. This latter yields the most valuable fibre of any derived from species of agave, and there is little doubt it would thrive equally well in India. The important fibre industry of Yucatan, created entirely within the last twenty years, is now of the annual value of about three-quarters of a million sterling. India has therefore good grounds for devoting attention to an industry which so far has established itself on a moderate scale in spite of adverse circumstances.

4. In order to test the quality of the fibre produced by Agave vivipara, when cleaned by machines similar to those in use for the preparation of Sisal hemp in Yucatan and the West Indies, a few of the broken leaves, about a foot to two feet long, taken from the larger plant received at Kew, were forwarded to the Death Fibre Machine Company, 147, Leadenhall Street, E. C. A sample of the fibre obtained by passing the leaves through the Death machine is forwarded herewith (marked A); while for purposes of comparison a sample of the ordinary Bombay aloe fibre as it comes into the London market direct from India, is also enclosed (marked B).

5. The great difference in quality and value between these two samples is well given in a report prepared by Messrs. Ide and Christie, a copy of which is herewith attached. The value of the machine-cleaned fibre ranges, according to length, from £25 to £30 per ton. The ordinary Bombay aloo fibre, cleaned by hand, is worth only from £5 to £12 per ton. These figures fully bear out the opinion offered in my letter of the 21st February 1887 that the Bombay aloe fibre industry was capable of being greatly improved. At he present time, there is in stock in this country a thousand tons of Bombay aloe fibre, which prepared roughly by hand will only realize about £8,000, a price that will probably hardly pay expenses. If this fibre had been cleaned by machinery and presented in the condition of the sample marked A, it would realize about £27,000 or more than three times its present value. It appears possible, therefore, without any extension of the present agave plants in Bombay, to increase to a very appreciable extent the returns on the shipment of aloe fibre from that Presidency.

6. Mr. Thiselton Dyer has little doubt that the facts herein stated will prove of considerable interest to the Government of India, and they deserve to be widely known amongst those concerned in the aloe fibre industry.

Letter from Ide and Christie to D. Morris, Esq., M.A., F.L.S., dated 72, Mark Lane, London, E. C., 6th February 1890.

We have your favour of the 4th instant with sample of fibre extracted by Death's process from the leaves of Agave vivipara. This is an excellent fibre, of fair strength, fine colour (which, however, may change somewhat under continued exposure to the air), and were it three times as long, would be worth £30 per ton today in London; if twice as long £27; and as it is, it may be valued at £25.

The ordinary "Bombay aloe" of commerce presents a very different appearance to your specimen, as perhaps samples in your museum may show. Its value, today is—good £12, common £5 per ton.

LABOUR (COOLIE) SUPPLY IN CEYLON:

THE KANGANI AND "COAST ADVANCES" SYSTEM ON CEYLON ESTATS.

Recently, when detailing the system of money and rice advances against monthly wages to coolies employed on estates, and of settlements for two or three months at a time, we alluded to the kangani system as having, equally with the system described, survived all outside objections. We did not then however, enter on the peculiar feature of this kangani system, that of "coast advances." "Coast" in Ceylon parlance means the opposite coast of India, and the "advances" are made primarily to Tamil kanganies to enable them to proceed to the coast of India and inland into the densely peopled districts, to obtain and bring over a force of labourers. By a now settled custom the advance made to the kangani, and for repayment of which he is responsible to the estate owner or superintendent, is R10 for each cooly. By another well established custom this advance of R10 per head has assumed to some degree a perpetual form. That is to say, the kangani of a gang of labourers employed on an estate owes the estate R10 for each of his labourers, while they are correspondingly indebted to the kangani. If there are 500 men, women and children (the latter able to work) employed on an estate, the books of that estate as a rule so general as to admit of few exceptions, will show R5,000 out in "coast advances." All this is simply a matter of custom and agreement, and in the rare cases where coolies cheat a kangani, or a kangani and coolies cheat their employer, there is only the civil remedy available, the labour laws providing no penalties for what they do not recognize. Under certain circumstances such as we heard of recently, the charge of "obtaining money under false pretences" could, we should think, be preferred. The honourable understanding amongst planters is that when a kangani and his gang leave one estate they shall not be engaged for employment on another unless the kangani produces a "tundu," that is a bit of paper from the previous employer stating that anyone paying such previous employer the advances due, the amount being stated, can take on the kangani and his gang. It is, of course, part of the honourable understanding that the previous employer acts *bona fide* and uses all his influence for the transfer intact of the gang to the estate of the person who has given him a cheque for the advances. As a general rule the system works

smoothly, because the vast majority of the planters are honourable men. But there are a few "black sheep" amongst the planting community, and of one of these we lately heard, that after apparently transferring a couple of gangs, whose advances had been repaid to him, he allowed a considerable proportion of the gangs to come back to work on his estate, protecting and encouraging the deserters, instead of assisting the kanganies to recover the lost men and aiding the estate proprietor whose money in repayment of advances he had received. Of course a person thus acting is not recognized as an honourable man, and it seems to us that all such cases should be taken up and publicly dealt with by the District Associations. It will be seen that paying coolies every cent due to them as wages each month tends to make the coast advances more and more risky, and on this subject and that of weeding contracts given to kanganies, as constituting an additional security, our correspondent "1873" writes largely today. His views are worthy of careful attention, but we are sorry to see him give so unfavourable an opinion of the class of labourers of Tamil origin who have been born and brought up in Ceylon and who are included in gangs receiving "coast advances." We had hoped that such coolies would have been amongst the best and most trustworthy labourers on estates, and we feel sure that in many cases old planters have so recognised them.

The system of "weeding contracts" may be briefly explained. In Ceylon, whether coffee, tea, cinchona or cardamoms are cultivated, the keeping of the ground clear of weeds is deemed essential. Gradually a custom has arisen of separating this work from the other operations on an estate, and entrusting it to the various kanganies, who, beside the labour they provide for general purposes of the estate, employ "weeding gangs" on their own account. On the understanding that the section of an estate for which a kangani gets a weeding contract is kept clean, by being weeded, as a rule, once a month, the estate owner pays the kangani a certain monthly rate per acre,—generally R1 per acre per mensem, or R12 per acre per annum. On these contracts the kanganies usually make an appreciable profit, in addition to head money which they receive for coolies in the gangs they provide for the general purposes of the estate. Kanganies will object to go to estates on which weeding contracts are not given out. It is evident, therefore, that the system is generally remunerative to the kanganies, while, so long as full weeding gangs are kept up and the land is kept clean, it saves the superintendent a great deal of trouble. When a weeding contract kangani fails to keep his section in a clean condition, the superintendent puts on a portion of the force at his disposal and charges their wages against the contract rates, paying the kangani only the balance due to him. Our correspondent "1873" indicates that this system of weeding contracts, beside adding to the emoluments of the kanganies, acts as an additional security to the estate owner for coast advances, in proportion to the amount due to the kanganies for weeding contracts which is kept in hand.

To outsiders all this may seem complicated, unscientific and not in accordance with strict law. But "custom," which suits all parties and of the working of which none but defaulters or the dishonest and those who suffer at their hands complain, has, as we stated when discussing the wages advance system, all the binding force of statute law with far more of the equity which is superior to all written law, whatever its penalties and sanctions may be. The fewness of the cases in which the courts have to decide disputes between coolies and their employers, is a strong argument for letting well alone. The cooly is a free agent,—free to come and free to go,—except where he compromises his freedom by going into debt. This the cooly too generally does, borrowing of the kangani, while the kangani borrows from the chetty, high interest being charged in both instances. In this as in other cases of the kind "the borrower is servant to the lender." Some believe, with Sir Arthur Gordon, that a system of full settlement of wages at the end of each month would prevent this great evil. But the vast majority of those who know the people and their idiosyncracies best have no faith in the panacea. We largely share their scepticism, and we look for improvement only to time and education—giving this latter term a much wider meaning than mere schooling. One thing is certain: that no body of labourers in the world are, as a general rule, better treated than those employed on Ceylon estates, it being the interest of the planters as well as their duty to treat the class on whom their own success depends, not only fairly but kindly. Sinhalese labour is useful but not reliable; and if, from any cause, the Tamils of India ceased to seek employment in Ceylon, the vast majority of the estates would have to be abandoned.

TEA PLANTING IN THE NUWARA ELIYA DISTRICT—OVER 6,300 FEET.

(*From a Resident Proprietor.*)

You asked me to let you know how my yield turned out compared with my estimate. I estimated that I should get 20,000 lb. green leaf between 30th September 1889 and 1st October 1890. I shall exceed that this month considerably, and have 3 months to the good. This year's yield is added to slightly by tipping 5 acres planted in August 1888. But that is very little.

	Acreage.	Garden.	Altitude.
12½	in the block	("Elephant Nook.")	6,200 feet
½	for reserve		
13			

Less bungalow and gardens, two large ponds, lines, store, two cattlesheds, pig-sty, &c., say two acres, giving in tea 11 acres.

11 acres planted Attabage *seed at stake*, after came up here in July 1885, has yielded as follows:—

	1889.	1890.
January ...	577	... 1,096
February ...	1,430	... 1,097
March ..	1,130	... 2,766
April ...	1,555	... 2,747
May ...	2,125	... 2,455
June ...	1,266	
July ...	1,645	
August ...	1,721	Pruned (cut across) in August 1888.
September ...	1,683	
October ...	1,710	
November ...	2,160	
December ...	2,038	
	19,040 = 433 lb. made tea per acre.	

The seed at stake was not a great success. Fully 25 per cent were supplied with plants (mostly plants from Abbotsford; seed from Inverness) in 1886. The black grub ate down the shoots time after time; otherwise the seed at stake germinated well.

When planted "seed at stake," it was all in cinchona, and the ground was dibbled not holed for the tea.

COFFEE PLANTING IN THE STRAITS SETTLEMENTS AND IN CEYLON.

An ex-Ceylon planter now travelling in the farther East writes as follows from the Straits :—

"Will you kindly oblige by informing me, whether there is any really good virgin forest-land in Ceylon up-country, in Haputale, or elsewhere, belonging to Governme t or private parties, that would produce *good* coffee if planted to pay, or would it be affected with leaf disease and not come well into bearing?

"Is it proved that leaf disease exists in the seed or coffee bean? Leaf disease on Liberian coffee in Johore does not appear to do any harm: the trees appear to winter, and the leaves drop off, but fresh ones come in their place very soon afterwards and the coffee bears very well on very poor sandy soil close by the sea, but as you may know it is a large bulky tree and large cherry with very thick tough skin and the bean not large in proportion.

"From reports tea is not doing so well in Johore as might be expected considering the suitable climate: it does not flush well. Pepper and gambier appear to pay the Chinese well. I trust that tea is doing well in Ceylon."

There are no doubt some select blocks of forest land still left even in our hillcountry, notably one now offering in Haputale, and if our correspondent or his friends mean business, let them send an advertisement with their address, and replies from proprietors or agents are very likely to result. Coffee planting with shade should do in Uva as well as in Dumbara. We are very much puzzled as to how Liberian coffee in Johore can escape injury from leaf disease: our old friend Mr. Turing Mackenzie should tell us all about it. In Ceylon the leaf fungus was so prevalent on Liberian coffee leaves in the lowcountry that it could be spooned off! It is quite possible as trees grow older they may do better; but unfortunately most of the Liberian in Ceylon was cleared to make way for tea.

CEYLON UPCOUNTRY PLANTING REPORT.

THE MONSOON AND EARLY PLANTING—COFFEE: GOOD CROPS—CACAO—TEA—COOLIES.

June 5th.

What has come over the monsoon? It is to be hoped it will turn up by-and-by; meanwhile the times are rather rough on those men who, anxious to get in plants at the very first rains, began to put out a fortnight ago. It seems quite clear that in planting you can rise too early to catch the worm. When travelling the other day I met a man whose only reason for leaving his estate was, that he had started planting, and just wished he had not! He found life pleasanter away from the suffering plants. When a planter tries to be smarter than his fellows, it would seem as if Providence somehow steps in, and keep him humble!

The COFFEE this year is wonderfully healthy, and where it has been at all treated well there is a very fine crop indeed. There is hardly any leaf disease visible, and as for bug you have to look for it. I don't know that I have seen coffee looking so well for ever so long: but then nobody has any faith in its continuing to do so, and it may be covered with fungus and blackened with bug, ere many weeks are past. There have been four or five blossoms, all of which have set well: the last was out about a week ago, and ought to have been washed off by the monsoon, but wasn't.

CACOA still keeps throwing out its wealth of blossom, in a marvelous way, and is healthy and flourishing. The spring crop is coming in, and seems to be rather better than last year. The borer is about as usual, and wants a lot of steady hunting to keep it in its own place. It is a sad plague.

TEA flushes in a moderate way. There is a want of rain. If there was more moisture we would do better.

COOLIES keep coming in, and from some parts of the coast there is a willingness to emigrate owing to the drought, which should be encouraged Advances have shown better results this season than for some seasons back, provided the money has gone to the proper quarter. Where there is the least pinch in any of the recruiting districts of S. India the inhabitants thereof instinctively turn their eyes to Ceylon. PEPPERCORN.

TOBACCO PLANTING IN DELI.

(*Pinang Gazette*, 23rd and 27th May.)

A fermenting shed at Wamptoe Estate with 100 bales of tobacco has been burned to the ground. As kerosine oil was discovered about the place, the fire is believed to have been the work of incendiaries.

The Committee of management of the Soekaboemi Agricultural Company have petitioned the Netherlands India Government protesting against the recruiting of Javanese coolies for Australia, British North Borneo and the Straits Settlements. They ask the Government not to sanction the exportation of any more coolies to those places, basing their objection on the contents of the Government Directory for 1890, and state that if emigration be allowed to go on they will in a short time be under the necessity of applying for Indian labour, which at present is not allowed by the Indian Government to enter the Dutch Colonies. They therefore suggest the introduction of a law prohibiting the export of coolies from Java for places outside of Netherlands India.

Sumatra tobacco has been sold at Amsterdam at from 162 to 202 guilder cents per half kilo. The next sale will be held on the 3rd proximo, and the result will be known here on the following day.

At the yearly meeting of shareholders of the Amsterdam Deli Company it was resolved to declare a dividend for 1889 of 72½ per cent.

The free immigration of Chinese coolies direct from China has had no favorable results as yet, but what is a great thing is, that the Government have sent a Consul to the south of China, and judging from the ability of the person appointed to that post, a good deal may be expected in future The importation of Indian labour is, however, recommended to the Government with the view of immediate steps being taken in the matter.

THE DISCOVERY OF RUBBER TREES in the great Aruwimi forest by the Stanley expedition is good news to electricians, for the existing supplies have been likely to diminish. In the meantime, an artificial substitute, which, according to Mr. Latimer Clark, F.R.S., promises well, has been brought out, and is to be subjected to searching electrical tests. There are five sorts of this new material—three soft and elastic like cured rubber, and two hard and elastic like wood or ivory. A sixth variety is lighter than water, but is not intended for electrical work. It is stated that the insulating property of the material is higher than that of gutta percha, and nearly equal to that of glass, while the cost is only about 2d per pound. Another advantage is that it burns with difficulty. Its colour is brown, black, or dark blue.—*Globe.*

RICE.

Does long habit develop a hereditary faculty of rice-tasting? Folks in London who use rice to make puddings or to eat with jam and cream, pay from 9s to 12s a cwt for Bengal white rice, while for Japanese they only give from 10s 6d to 11s 6d, according to the quotations of March 8th. Offer Bengal rice to a Japanese, however, and he turns up his nose at it with contempt. Even a common labourer speaks of imported rice as a miserable affair, and if he finds himself unable to purchase the home-grown article, prefers to have recouse to barley. To him foreign rice is insipid and even unpalatable, whereas to outsiders the difference is scarcely perceptible. This is why rice must go almost to famine prices in Japan before any prospect of profit presents itself to importers, and this is doubtless why so much reluctance has been shown by the Exchanges to admit foreign rice into their quotation lists. It appears that even on the Tokyo Exchange, where enlightened views are supposed to prevail preeminently, great difficulties have been raised with reference to foreign rice, the majority of the shareholders being averse to giving it any public recognition. The officials of the Department of Agriculture and Commerce have, however, combated these scruples successfully, and it is now determined that imported rice shall be quoted in the lists, ranking there with the inferior quality of rice known as *imazuri-mai*, and being put at from 2 *yen* to 2·80 *yen* below the Japanese product. Of course something of the reluctance shown by the Exchanges must be attributed to the novelty of the contemplated procedure. Foreign rice, under ordinary circumstances, is a drug in the Japanese market. Nobody wants to eat it, and nobody thinks of dealing in it. Consequently very little is known about the ruling rates, and merchants do not care to touch an article so unfamiliar. The Osaka folks still maintain an attitude of refusal, but as Tokyo has consented to act in the desired sense, its example will doubtless be followed ere long. It is not the price of rice alone that signifies so much, however. The trouble is that nearly all the necessaries of daily life appreciate when rice is dear, so that great hardship results for the lower classes.—*Japan Weekly Mail.*

[This very objection to imported rice long prevailed in Ceylon, and many of the natives object to it to this day. At any rate they prefer the home-grown article. But long years ago the presence here of a vast body of Indian labourers gave imported rice an important position in our commerce which it retains to this day. For imported grain, chiefly rice, Ceylon makes an annual payment to India of about 1½ million sterling.—ED. *T. A.*]

PRECIOUS STONES AT THE ROYAL SOCIETY CONVERSAZIONE.

The Royal Society held the earlier of its two annual *conversaziones* on Wednesday night in the rooms at Burlington-house, and this, one of the great scientific events of the season, was as usual, a brilliant success. * * *

No social function during the present season would be complete without including something connected with Mr. Stanley and his recent expedition; and the Royal Society *conversazione* is no exception. Mr. Henley Grose-Smith was able to show on Wednesday night a selection from the butterflies collected in the great African forests by Mr. William Bonny. Nine of the species collected by Mr. Bonny are new to science, and many of the species are West African. * * *

Professor Judd showed some interesting and beautiful specimens of minerals brought from Ceylon by Mr. C. Barrington Brown; the enormous beryl, between 5lb. and 6lb. in weight, attracted special attention. * * *

An exhibit by Mr. D. Morris, of the Royal Gardens, Kew, was of great practical interest; this was a sugar-cane seed and seedlings. As the result of some experiments with self-sown seedlings, it is anticipated that, by cross fertilization and a careful selection of seedlings, it will now be possible to raise new and improved varieties of sugar cane, and renew the constitutional vigour of plants that have become deteriorated through continuous cultivation by cuttings or slips. Great importance is attached to the subject in sugar-producing countries, as it opens up an entirely new field of investigation in regard to sugar-cane cultivation. Of equal practical interest was Professor Marshall Ward's exhibit of a selection of transparent photographs, showing—(I) the habit, &c., of various trees from different parts of the world; (2) the comparative structure and anatomy of several European timbers; and (3), some of the more prominent features of diseases of wood, &c., and fungi causing them. * * *

Several Egyptian exhibits were very popular. One consisted of three pages of an ancient Egyptian book on medicine, written on papyrus by a scribe named Usertesen Sen, in the 26th or 25th century before Christ. It contains directions for the use of midwives, written in black and red ink, in hieratic characters. A translation was given of one passage on the "Treatment of a woman who is pained in her legs and in all her limbs as one who is beaten. . . . Do thou with regard to her thus: let her eat grease until she is cured." * * *—London *Times*, May 16th.

THE BONE TRADE OF INDIA.

In the last report on Agricultural operations in the N.-W. Provinces there are some interesting particulars of the bone trade in India:—

The carcases of cattle and other animals, with very rare exceptions are allowed to lie in ravines and waste places and it is the bones of these animals that are exported from the N. W. Provinces. The total number of horses and cattle in the provinces returned for 1888-89 was 23,608,455. Assuming the rate of mortality per annum at 10 per cent. and the weight of dry bones in a carcass at 20 seers, the total weight of bones which annually becomes available for use amounts to over 40,000 tons.

Mr. Holderness further reports:—The trade in bones, so far as these provinces are concerned, is of a very recent date, it is entirely in the hands of Eurasians and Mahomedans, who send out agents into districts adjoining the line of rail. These employ coolies, generally of the *Chamar* caste, to collect bones for them, and large stocks ready for despatch may often be seen in the neighbourhood of a railway station. The trade is evidently a profitable and growing one, for I have been surprised during a tour recently made through Southern Oudh and the Azamgarh, Jaunpur and Allahabad districts, to see the number of persons engaged in bone-collecting. The town of Phulpur, 17 miles from the nearest railway station, is an instance of the sub-depôts which are spreading over the country. As "bone" does not form a head in the classified list of articles prescribed for registration of rail-bone traffic, the full extent of the traffic is not known. The following figures have been kindly furnished by the Assistant Auditor, East Indian Railway, for the stations on his line in the North-Western Provinces, from which the export of bones in 1888 exceeded 5,000 maunds. Similar statistics for the Oudh and Rohilkband Railway and other Railway lines within the province was not available.

	Mds.		Mds.
Cawnpore ...	25,944	Sirsaul ...	7,275
Agra ...	20 189	Sirathu ...	6,604
Allahabad ...	89,986	Chola ...	6,372
Hathras ...	85,556	Mohar ...	5,134
Aligarh ...	84,686	Fatehpur ...	5,024

The total value of the bones exported by sea in 1888-89 is given in the note received with the Government

of India's orders quoted above at 17·49 lakhs of rupees' the corresponding weight of which in the monthly returns published by the Government of India is 35,567 tons. The annual statement of the trade and navigation of British India which gives the share contributed by each maritime province has not yet been received by me for 1888-89, so that the quantity exported from the Bengal Presidency in 1888-89 is not known. In previous years the exports from Bengal amounted to one-third of the total exports from India. Assuming that 12,000 tons were exported from Bengal in 1888-89, and that the whole of this quantity was supplied from these provinces, it would still represent only one-third of the total quantity which annually becomes available in those provinces through the normal mortality of horses and cattle. The drain, however, of the export trade on the bone supply of any particular district cannot be measured in this way. The northern districts which border the sub-himalayan forests and are essentially pastoral districts are still imperfectly served by railways, and in them the bone trade does not exist. My inquiries lead to the conclusion that the trade is confined to the central and eastern districts lying along the East Indian and Oudh and Rohilkhand Railways, and that even in these the outlying tracts are rarely visited by the bone collector. The villages within a ten-miles radius of the railway stations mainly furnish the supply, and they are now being completely cleared of all old stores of bones which in former days used to decompose through a series of years near the inhabited sites.

The home collector confines himself to breaking up his spoil with a hammer so as to make it more portable, and no further treatment is usually attempted by the wholesale exporter or the shipper. Occasionally, however, the exporter employs a *dhekli* or stone-mill ordinarily used for grinding lime.

At present bones are not directly used in any form as manure by the native agriculturist. Indirectly, as they decay, a portion of the nitrogen and phosphates of which they are composed finds its way to the soil. But this process of nature is wasteful. Caste and superstition would lead the Indian cultivator to reject bone manures even if he were to be convinced of their utility, and hitherto he has been without the knowledge of or the means of obtaining superphosphates, the ordinary form in which bones are now used for manure by the European agriculturist. The present export trade, therefore is economically defensible, since one portion of the world is thereby enabled to use with care and knowledge in relation to a special system of agriculture what another portion has for centuries allowed to go to waste. Again, as yet it has not been proved that in Indian agriculture bone manures can be profitably employed. A maund of bone dust costs Re. 1, thirty-five maunds or farmyard manure can be bought for this sum. According to the chemists, the 35 maunds of farmyard manure contain four times as much nitrogen as one maund of bone-dust, and nitrogen is the element conspicuously deficient in Indian soils. Experiments with bone-dust and bone superphosphates have been made for a series of years on the Cawnpore Farm with maize and wheat crops. The general result is that, as compared with the standard unmanured plot, there has been a loss on the crop, the cost of the bone manure overbalancing the value of the increased produce. This is especially the case where bone superphosphates are used, owing to the high price of sulphuric acid. Nothing can be inferred from these experiments as to the possible effect of bone-manures, on Indian soils other than the light loams common to the Doab or on special crops. But as regards soils similar to that of the Cawnpore Farm and the great staple crop of wheat, they suggest the conclusion that the Indian ryot, with a rupee to spend on manures, had better lay it out, as at present, on cowdung or indigo refuse than on superphosphates or bone-dust. In England the peculiar value of bone manures has been established in connection with the turnip, mangel-wurzel, and other root-crops. In India we have no turnips (save as a garden crop), and the area under carrots potatoes or other root crops is very limited. The matter is eminently one in which the advice of a really competent chemist, on a full survey of Indian agriculture and a careful analysis of soils, might be most valuable. So much energy and enterprise, European and native are now engaged in the cultivation of indigo, tea, sugar and jute, that such advice would not fall on barren ground.—*Madras Mail*, May 30th.

THE ROMANCE OF TEA SELLING

is surely more conspicuously illustrated in the experience of Mr. Thomas J. Lipton than in that of any other living man. It seems that a rule of his business life has been since he began to sell in a large way through multiplied agencies, to take up some one article in universal request and make it widely available. We refer to the mother country of course. Only about a year ago, did it strike Mr. Lipton to take up tea, and after so deciding, it was from reading about Ceylon and liking the article, that he made Ceylon tea a speciality. Mr. Lipton has by no means multiplied his tea agencies to the extent he intends: indeed in the Highlands of Scotland he has only lately opened and his forty tea packet stores in and around London have not all been in operation very long. Nevertheless in this, his first year, Mr. Lipton calculates he has sold 4 millions lb. of tea. It is quite possible therefore, that the progress in this department for some time to come may be after a geometrical ratio, especially when America is to be added to Britain as the scene of operations. In the old country, "Lipton's packets" consist of a blend, the preponderating tea being Ceylon, and although he has become the purchaser of Ceylon plantations, Mr. Lipton is not quite certain about entirely giving up the blend. He will, of course, add a packet business in pure Ceylon tea direct from the plantations, no doubt at a higher price than the "blend."

But in the case of America, beginning in a new field altogether, and with the object of winning so many people from a vitiated taste for faced and adulterated China and Japan teas, to the appreciation of a really superior article, Mr. Lipton is quite ready, we understand, to pledge himself to deal only in *pure Ceylon tea.* This is a most important fact; for if this great dealer begins on the principle of spending £15,000 in advertising Ceylon tea—and Ceylon tea only—from Chicago westwards to Denver and San Fransisco, northwards into Canada, east to Philadelphia, and south to New Orleans—he will be doing [more for this Colony in a short space of time than our Tea Fund Committee and the Ceylon-American Company could accomplish probably in a score of years. It becomes a question then whether the Ceylon tea planters should not do all they can to recognise, encourage, and back up Mr. Lipton. He evidently has abundant command of "the sinews of war"—he will want no aid in capital or tea. But it may be a question whether the North-American Continent should not be left entirely to Mr. Lipton's "Ceylon Agencies" and that our Tea Fund Committee should pledge themselves to encourage no competition. The necessary corollary from such a decision would be the winding-up and withdrawal of the Ceylon-American Tea Company, and this could best be arranged we should think by Mr. Lipton taking over the business—the New York shop, stock, staff and goodwill as they stand? We should think the directors and shareholders would only too gladly enter into such an arrangement, if a proposal were made to them so soon as Mr. Lipton has seen what has been done in New York, and decided on his

own course of operations. Then, finally, it remains to be considered as to whether the Planters' Association or the Tea planters of Ceylon could not give Mr. Lipton such an "official recognition" (if the term may be used) as could be turned to good account in his great campaign to win the people of the States and Canada for Ceylon tea? Could Mr. Lipton be nominated "Commissioner representing the Ceylon Tea Planters in America"? If so, we believe the designation would be acceptable, and very useful in advertising Ceylon tea up and down that country. All these are matters which the Tea Fund Committee may well consider at their meeting on Friday morning, and we commend them to favourable consideration. At the same time there is no occasion for haste. Mr. Lipton, as already announced, leaves by the P. & O. S. S. "Victoria" for Europe tomorrow. After a short interval he crosses to America and his decision about beginning the "tea campaign" will not be taken until he has the reports of his agents in America who have already been instructed to collect information and prepare reports on the proposed new business, against their principal's arrival. No doubt before the end of August, Mr. Lipton will be able to telegraph his decision to Ceylon and it is against that day, that the Tea Committee and the Company's Directors should consider what their course ought to be, in the event, as is likely, of Mr. Lipton undertaking the Ceylon Tea Campaign on a big scale in America.

DAVIDSON'S DOWN-DRAFT SIROCCO.

(BY THE "PERIPATETIC PLANTER.")

Thanks to the data thus obtained, Mr. Davidson has found that theory is borne out by practice in a remarkable manner in several directions. Thus the brokers report these teas *quickly* fried at a *low* temperature (some were pried in only four minutes) 1*d*. to 2*d*. per lb. better in the case of medium grades, and from 4*d*. to 6*d*. per lb. better on the fine qualities, than teas made from the same leaf, at the same time and place in other driers! That confirms the foundation theory, so to speak, of the "Down-draft." Then he has found, as theory led him to expect, that the greater the volume of air passed through the tea in a given time the more rapid the effect upon the leaf; in other words, by increasing the size and speed of his fan, a lower temperature may be used, with a consequent saving in fuel, so far as the fuel used in the stove is concerned. From this it is only a step to the corrollary, if the fan be increased in size and speed, and if the stove be also increased in size, then a further vast increase in *outturn* and improvement in quality are to be expected. Hence, his new large "Down-draft" Sirocco, which is to turn out two maunds per hour. The economy of fuel as shown on the yellow circular referred to, is certainly remarkable. Last, but not least, comes the improvement in the construction of the stove itself. This has been completely reorganised, so far as the manufacture of the parts goes, the principle of beating, &c., being still the same. It would be difficult to describe the changes effected without diagrams; but they certainly appear very radical when explained by diagram, so much so that the life now anticipated by Mr. Davidson, *viz.*, five years, appears quite reasonable. This it will be acknowledged is no trifling advantage in itself. The fan, I might mention in passing has a mouthpiece at the exit, so to speak, and it occurred to me, that employers of the Blackman system of withering could easily attach canvas pipe or tube to this, and thus convey the warm air to the withering room, *i. e.*, to the side opposite the Blackman Fans, and be thus able to employ the Blackman system even in houses apart from the tea-house proper; or in the case of upper-stories, convey the warm air to these without loss of heat in transit.—*I. P. Gazette.*

TEA IN THE AZORES.—The coming spring is looked forward to with lively interest by the agricultural classes in the Azores, and will long be remembered as marking a new era in the commercial prosperity of the Island. Tea planting has made such great strides there and the picking of the leaf is expected to be so considerable this season that the pioneer shipment will this year be made to the London market. It is affirmed that Madeira tea will in point of flavour beat the China leaf hollow, which is doubtless owing to the balmy climate of the Azores. It was only a decade ago that the tea plant was first introduced there by Viscount Pazo d'Arcos, then Governor of Macao, who made several shipments of the plant from almost all the tea districts of China. A few years afterwards when Senhor d'Arcos heard that the plant was already acclimatized in the islands, and that there was every reason to suppose that it will thrive, he engaged and sent a few Chinese tea planters to Madeira who taught the natives there how to manipulate the leaf.—*Ceylon Advertiser.*

THE "HAPUTALE" OR "DOWNALL" GROUP OF ESTATES—Dambetenne, Monerakande, and Laymas—has been purchased by Mr. Lipton, we are credibly informed, for £21,000 sterling,—a bargain which seems to take the breath away of not a few authorities who know the very great value attached to these plantations some years ago; and also the large extent of splendid tea now coming on, besides the good coffee remaining, making at least, the Dambetenne and Monerakande estates still very valuable. That Mr. Lipton has made a great bargain is shown by the fact that he was offered £2,000 on his price by a Ceylon planting capitalist before he left Colombo. Indeed, there is a general feeling of surprise at the places selling for £21,000, and it is supposed that if the group had been advertised for sale for some months in Ceylon and in London, at the upset price of £21,000, a considerable advance on that amount could have been obtained. Apart from other advantages, there are scarcely any Uva estates that will be so benefited by the Haputale Railway as this group—a tramway on the level, it is surmised, can be made very cheaply from a new Dambetenne factory to the goods station. The group contain the following areas in cultivation and reserve:—

	Total.	Cultivated.	Tea.	Coffee.	Grass.
Dambetenne ...	771	433*	112	313	8
Monerakande...	1,055	536†	274	242	15
Laymastotte ...	473	336	138	171	27
Total acres ...	2,299	1,305	524	726	50

* With 12,000 cinchona trees.

† 5 acres cinchona.

It will be observed that the price does not make more than £16 per acre for the area in cultivation without counting nearly 800 acres of reserve.—Dambetenne estate has as yet no factory, the leaf of the upper estate so far having been all sold to Pitaratmalie and no tea sales can have appeared under that mark, so that it is difficult to see how a name can have been made for its delicately flavoured tea as a contemporary alleges. The Laymastotte factory—the largest in Haputale—has been working and Mr. Lipton's expert, Mr. Duplock, spoke very favourably of the tea being manufactured there. This factory is on the Laymas road, and it was thought that when completed, it would serve for all the group. But a Dambetenne factory would, as we have said, be very convenient for the railway.

OUT OF SIXTY-NINE COLLERIES now being worked in India it is surprising to find that no fewer than sixty-two are in Bengal. These employ a daily average of 25,000 hands, and supply Calcutta and the railways to the west as far as Lahore. During the ten years ending 1888, the output of Indian coal increased from 229 to 478 lakhs of maunds. During the next ten years the increase will probably be still more rapid. Upper Burmah possesses on the Chindwin river coal measures of great extent and value, and may be expected before long to add considerably to the supply.—*Indian Agriculturist*, May 10th.

TEA FOR NATIVES.—The Indian Tea Supply Company—we are glad to see from the *Pioneer*—at a meeting in Calcutta, decided to continue operations. It is felt that the object of wooing the natives of India to the use of tea is of great importance to the welfare of the industry, and that it is not placed beyond the range of possible achievement. The experiment will be watched with keen interest, and the knowledge that it might have been brought to a premature close may stimulate a feeling of sympathy into active co-operation. It is known that natives will drink tea readily enough; what they object to is the price. Anyone then who wishes to develop their taste can assist very materially by making gifts of tea among his native friends. Only let the taste spread and take root and the money obstacle will soon banish.

THE RAINFALL OF NORTH BORNEO FOR 1889 ranged from 73 inches at the driest station to 141 at the wettest, the figures for the capital, Sandakan, being 104 inches. Dr. Walker in his report stated:—

The rainfall for the year has been on the whole about twenty-five inches below the average of the last eight years. This is explained by the fact that the wet season 1888-89 was early and that of 1889-90 late, so that a smaller proportion than usual of each of the wet seasons fell within the year. The fall of 9.12 inches on 14th February is the second heaviest on record, being exceeded only by the 14th of January 1887 with 14.47: both these falls took place in Sandakan. It may be pointed out that these returns, so far as they go, bear out the remarks made in my report for 1887 as to the way in which the "Intermediate" wet season gets more marked the furthest west we go. In fact in some years the Intermediate wet season on the West Coast gets prolonged so far that it practically becomes continuous with the succeeding true wet season.—*Official Gazette*, May 1st.

MADAGASCAR TIMBER.—Strenuous efforts are being made to introduce timber from Madagascar into the English market. Hitherto the "Great African island" has exported but little in this direction, and most of what has arrived, chiefly smuggled ebony, seems to command good prices. Until quite recently the Malagasy Government prohibited the export of timber from the island, but at length a concession was granted to an Englishman, and a company has been formed to work it. This, the "Madagascar Company, Limited," entertained a large number of timber merchants and others at luncheon at the Cannon street Hotel on Thursday, the 20th instant, Mr. J. W. Shepherd (of Messrs. Seddon & Shepherd) in the chair, to inspect samples of the wood. Amongst those present who referred to the timber resources of the country were Mr. S. Procter (Consul for Madagascar) and Mr. T. Roe, M. P. The principal varieties exhibited were a kind of rosewood, yellow teak, mahogany, and a remarkable species of the last-mentioned called "natte." All were peculiar in being very heavy, and, at the same time not difficult to work. Subsequently the party went to the docks and viewed the materials in bulk. Judging from inquiries already made by merchants, it seems tolerably certain that Madagascar wood will soon become a conspicuous feature in the timber trade.—*Indian Engineer*, May 3rd.

BANGALORE MANGOES.—Col. Mallock, who has settled himself in Mombasa, Africa, has planted in the dark continent a lot of kernels of the mango he took with him from Bombay and Bangalore, which he reported were doing well. But time will shew whether they will flourish there. Six of the best grafted mango plants from Bombay were growing healthily. The cloudy prefers the climate of Mombasa with a "nice breeze all day" to that of Bangalore.—*Spectator.*

THE CANDLE PLANT.—In the Northern and Western parts of Mysore a species of cotton plant grows known to the natives as the *depathi mara* or candle plant. The seed pod is about two or three inches in length and divides in three sections when ripe, each section containing a cluster of seed closely patched with cotton wool. If the narrow end of the section be lighted it will keep aflame for about ten minutes, the seeds giving off a large quantity of oil. The cotton is of no use for spinning, the yield from each pod being extremely small.—*Bangalore Spectator.*

SUGAR CULTIVATION IN TAIPING DISTRICT OF THE STRAITS SETTLEMENTS.—There are 22,414 acres alienated for the purpose of sugar cultivation, distributed as follows:—Krian river 10,781 acres, Kurau 5,379 acres, Gula 6,000 acres, Bagan Tiang 254 acres. Of this land it is estimated that 7,190 acres are this year under cultivation as against 7,120 in the previous year; a slight increase, and a sign that this industry is flourishing. The estates under cultivation consist of 3,745 acres on the Krian river, 2,477 acres in Kurau, 900 acres at Gula, and 68 acres at Bagan Tiang. Estate owners have not found it so difficult to procure labour this year, as will appear from the fact that 1,199 Sinkehs were registered this year as against 561 in 1888.—Official Report, April 1890.

THE SAGO PALM.—The sago palm bears fruit but once. Its load of nuts is its final effort; it has fulfilled its allotted task in the great round of nature, and there remains nothing for it but to die. The nuts become ripe, and are strewn in thousands around the tree, until the fruit-stalk stands up by itself empty and bare. The great branches turn brown and drop one by one to the ground. Inside the trunk the work of decay is going on, until what at one time was a mass of white sago and pith becomes nothing but a collection of rotten brown fibres. One day the trade-wind blows perhaps stronger than usual, and the leafless column of the trunk falls with a crash, destroying in its fall many of the young palms that are already springing from the nuts scattered some months before. —*"A Naturalist among the Head Hunters," by C. M Woodford.*

MR. BARRINGTON BROWN evidently excites a good deal of interest in London with the fine Ceylon stone, a beryl of 4 or 5 lb. weight—a true "oriental emerald"—as well as other specimens which he was able to show at the Conversazione of the Royal Society. On page 36 will be found a brief account of the conversazione, and our London correspondent alludes to the large exhibit. This stone was found not far from Ratnapura and exhibited on velvet in an ebony case, it should make a pretty show. It is rumoured that the stone is likely to be bought for the Emperor of Austria, whose Crown jewels are specially emeralds and who has a London agent no doubt on the watch for any very fine or interesting emerald or beryl. In *Nature* of May 22nd we find the following reference:—

Specimens of minerals brought from Ceylon by C Barrington Brown, exhibited by Prof. J. W. Judd F.R.S. Large perfectly crystallized and clear berly 2050 grammes in weight. The specimen, though water-worn, exhibits the crystalline form. The colour is intermediate between that of emeralds and aquamarines. The specific gravity is 2·703. Fine crystal of yellow corundrum (oriental topaz). Well developed crystals of corundum (sapphires, &c.). Crystal of chrysoberyl from the same district.

California—What Forty Acres Will Produce.——J. Gardella, writing in the *Oreville Register*, California, says:—I own 40 acres of land about half a mile from Oreville, which is planted in fruit and vegetables. The following is a list of the amount and kind of fruit and vegetables that I grow on it during the year:—On a part of the land I grow two crops potatoes, corn, cabbage etc., and three or four crops of lettuce, radishes, spinach, etc. Vegetables of some kind are growing all the year round, and my peddling waggons run every day in the year with fresh vegetables taken from the garden. I have given under and not above the actual amounts grown on my place. The land is kept well manured, and is irrigated during the summer. Eighty tons peaches; 12 tons apples; pears, 3 tons; apricots, 10 tons; nectarines, 10 tons; plums, 4 tons; blackberries, 10 tons; raspberries, 11 tons; strawbarries, 2½ tons; grapes, 20 tons; quinces, 2½ tons; cherries, 2 tons; figs, 1 ton; potatoes, 30 tons; onions, 25 tons; cabbages, 20 tons; cauliflour, 1½ tons; carrots, 5 tons; parsnips, 5 tons; beets, 3 tons; sweet potatoes, 4 tons; water melons, 100 tons; musk melons, 25 tons; cucumbers, 2½ tons; peas, 3 tons; beans, 4 tons; turnips, 7 tons; rutabagas, 2 tons; green corn, 10 tons; squash and pumpkins, 4 tons; tomatoes, 40 tons; green peppers and okra, ½ ton; lettuce, spinach, radishes, celery, asparagus, and artichokes, 10 tons in all. I have 80 olive trees not yet in bearing, and 500 orange trees, of which a limited number are now in hearing; will have from them this year 5,000 oranges, worth at least 2 cents each on the tree. The fruit and vegetables are sent to the mountains for sale among the people there, and my waggons peddle every day in Oreville. Fourteen men are employed in summer, and seven in winter.—"*Coloniensis*" in *Aberdeen Free Press*.

"A Guide to the Literature of Sugar" being a book of reference for chemists, botanistss, librarians, manufacturers, and planters, with a comprehensive subject-index, by Mr. H. Ling Roth, the author of several works on sugar, has reached us from the publishers, Messrs. Kegan, Paul, Trench, Trübner & Co., Ld., London. From the Introduction we quote as follows:—

The features of the present compilation may be explained as follows:—

1. The titles of important publications are suplemented with brief abstract notes; works the titles of which are misleading or defective (as an indication of their contents) are similarly supplied with notes.

2. By a system of initialling references are given in order to indicate the library or locality in which the book referred to may be found.

3. The Comprehensive Subject-index refers to the notes as well as to the titles.

The work contains more than 1,200 titles of books, pamphlets, and papers relating to sugar. This number might have been considerably augmented had I included handbooks of chemistry, encyclopædias (one title only being excepted), etc. From amongst the numerous narratives of travellers only the more important are given, as works of this class are almost sure to contain some short reference to sugar. With the exception of Burn's Address and MacMahon's Plantership, which are inserted as an example of this class of sugar book, all works dealing with sugar from the slave or anti-slave trade point of view are excluded. There is also a large class of publications, chiefly anonymous pamphlets, which according to the title lead one to believe they refer to sugar, but which on the contrary are merely controversies on free trade and protection; these also I have endeavoured to exclude, but it is not always easy to determine which works have no right to appear in the list and which have. * * * This compilation extends to the beginning of the year 1885. I hope shortly to have ready a supplement bringing the work up to date, and then, if sufficient inducement offer, to bring out an Annual Guide.

We are surprised to find that though our Handbook is entered no mention is made of the *Tropical Agriculturist*.

Pepper Cultivation has been fairly started we learn from the Perak *Government Gazette*,—in the Kuala Kangsa district, Straits Settlements, 195 acres of pepper land having been demarcated. In Larut, pepper cultivation has attracted a good deal of attention, seven lots, representing 5,733 acres, have been alienated for this purpose during the year. The number of applications were very much larger, but a good many were weeded out by requiring the applicants to demarcate or deposit the fees for demarcating the land they applied for.

Progress in Fiji: Tea and Sugar.—Mr. Henry Cave, of the firm of Cave & Co., merchants, Levuka, is now in Dunedin, *en route* to London. He has been a resident of Hevuka for the past 18 years, and during 13 years of that period he had been connected with the Levuka Chamber of Commerce, while for several years he was chairman of it. Mr. Cave, when questioned on the point, said that the tea industry, which had only recently been started, gives every promise of increase. One feature of the industry that made it suitable to the colony was that the plant was so hardly, and in consequence hurricanes did it little or no harm. The young budding leaves were the ones that were picked, and when there was a storm, which would denude the plant of the old leaves, the sun and rain that followed quickly brought out the new sprouts. It was a plant that required plenty of rain, and it got that in the islands. Of the sugar industry Mr. Cave also speaks hopefully. He thinks the progress of the industry has been simply wonderful, and that it will rapidly extend very shortly. The principal producer is the Colonial Sugar Refining Company, of Sydney, who also have a branch in Auckland. That company have large plantations, with irrigation works, on the Rewa and Ba rivers, and is about to occupy another part of Levuka for the same purpose.—*Otago Daily Times*, Apri 121st.

Cotton in Fiji.—There is a very old friend of Fiji, slighted for many years past, which it would be well for the new generation of planters to know something about—Kidney Cotton. Sea Island Cotton deposed the Kidney twenty years since. Up to that period, planters thrived in Fiji, even on the moist Rewa River, from the proceeds of the growth of this snowy fibre, after paying the comparatively (with what they should be today) heavy charges of ginning, baling and shipping. In an evil hour, kidney cotton was rooted out, and supplanted by sea island, the demand for which is limited, with the result that the same planter who successfully grew kidney, grew poor in the production of sea island—even after capturing the gold medal from Philadelphia Exhibition—the seat of judgment in cotton. Nevertheless, strange to say, it is doubtful if a pod of sea island can be found in Fiji today. Kidney cotton has been grown spasmodically by an odd planter or two, and by the Native Department; but it is now almost on the extinguishing point. Can anyone say why? The drier positions of Fiji should be eminently suited for the production of cotton, and the meteorological conditions of this colony are now fairly well-known. As to whether it will pay to grow is another matter, and it is only fair to assume that the conditions existing in 1870 will hardly suit the conditions of 1890. Will some of the earlier planters of this colony write to the columns of this paper and, for the benefit of the would-be producer, state what they know for or against the production of kidney cotton. That enterprising colony, Ceylon, is just entering largely into the cotton industry; a considerable quantity of seed having been imported from Fiji for the purpose. A Ceylon paper lately stated that by the end of 1890, the production of cotton would be only second to that of tea and coconuts in that colony. The same paper also states that a large cotton spinning factory has been started at Colombo, with a 300-horse-power engine. Not a bad beginning. Australia requires calicoes, and why should not Fiji supply them? Anyway, why should not Fiji grow kidney cotton and make it pay, too.—*Fiji Times*.

PLANT GOOD COTTON SEED.

The intelligent farmer has often noticed in his fields of cotton some plants much larger than others containing a larger number of well-formed bolls, and with fibre whiter, more silky, and better in quality than on any other plant in the field. If he would select from this plant the bolls that are the largest, the finest and most perfectly matured; and, after ginning the cotton, carefully select the seed, rejecting all that are blasted or imperfectly shaped; and then carefully protect them to prevent fermentation or becoming in any manner damaged until the next planting season, the first important step would be taken. There is no chance in this matter, if we follow closely the laws by which nature performs her perfect work. The cotton seeds that have thus been carefully collected from the first plant must be placed in the best prepared soil, under the best conditions, and well cultivated. No cotton of an inferior grade must be planted in the immediate neighbourhood. In fact, it does not pay to cultivate inferior cotton, and it is best to send all such seeds to the oil mills. When blooms of low grade cotton open, insects and winds will soon transport the pollen from them to the pistils of the selected variety, and the germs will become depreciated by such inferior fertilization. There are a number of insects that visit the flowers of the cotton plant for the nectar they contain, and in the effort to reach the base of the flower, where the nectar is found, their bodies become covered with pollen that is transferred to the stigma where they come in contact with pistils of other flowers. It is readily seen therefore, that if plants of an inferior grade are growing and blooming in the immediate neighbourhood of the selected varieties, the insects will soon convey the pollen from the inferior to the superior plant, and the seed that will be produced will contain a germ with qualities of the inferior plant. This work of the insects might explain, to some extent, why it is that improved seeds in a few years degenerate so badly. If the selection of the seed is repeated from year to year, and no inferior cotton planted near enough to vitiate with its pollen by means of insects or wind, and if seasons are favorable, there seems to be no reason why practically perfect plants may not be produced.—*Alabama Experimental Station Bulletin.*

SUGAR FROM COTTONSEED.

The latest reported discovery in connection with cottonseed comes from Germany, where, it is said a process has been discovered for extracting sugar from cotton seed meal. The sugar is of a very superior grade, but cannot be sold in competition with the ordinary article. It is said to be inclined to ferment or sour, and, hence, better in use for preserving fruits. It is said to be fifteen times sweeter than cane sugar, and twenty times more so than sugar made of beets.—*Tradesman.*

TEA AT FOOCHOW.

(From the *Daily Echo.*)

We learn that prices for the new crop are much lower upcountry. Leaf is being offered freely at 9,000 to 12,000 cash per picul.

First crop teas have arrived in large quantities from the different districts, and we understand it is the intention of some of the tea hongs to send their musters out on the 19th instant.

Our readers will no doubt remember that, some time ago, we made mention of the intention of a few upcountry teamen to establish a Tea warehouse at this port in order to enable them to sell their teas *direct* to foreigners. The scheme was not entirely abandoned; but owing to the heavy losses the promoters sustained last year it has remained in abeyance. From what we now learn, this scheme, which by the way has come again under consideration, is to be on the co-operative principle; and, amongst other novelties in the working of it, the services of a foreign tea taster are to be engaged. It is calculated that if this project becomes an accomplished fact, teas will pass into the hands of foreign buyers at a far lower cost. The charges of tea hongs, the commissions to middlemen, and other heavy expenses they have had to meet are said to be enormous, and there would be a saving to the buyers to this extent, or to the greater part of it at least. It is calculated that as much as two millions of dollars were paid, one way and another, to these middlemen every tea season! Though the promoters fully expected that the new scheme will meet with strong opposition at first from the existing old fashioned tea hongs, we see no reason why, under good management, it should not be successful. Foreign merchants will certainly hail any change that is to carry with it a lower cost of tea. The arrangements between the Tea Guild and each firm of merchants with regard to weighing and the general conduct of the trade of the port, as well as the compact between the Tea Guild and the Chamber of Commerce seem to have worked so well that it is difficult at the first blush, to see how this new co-operative society is to work separately to the satisfaction of all concerned. It is true that an independent agreement could be made between this new Society and the merchants and Chamber of Commerce on the same lines as that in force with the Tea Guild. But we are touching on a point not included in the scheme; the promoters intend, we understand, to work quite unbound by any rules or regulations. Whether they will be strong enough to act quite independently and whether such freedom of action would meet the approval of foreign buyers remains to be seen. That the tea hongs have fattened at the expense of the teamen ever since the trade commenced is certain; and it is equally certain that if the services of these middle men could be dispensed with, the cost of tea would to a great extent be lessened.

TEA IN FORMOSA.

Mr. Playfair's report contains some interesting comments on the course and prospects of the tea trade, which has formed so important a feature in Formosan commerce. The inception of tea planting in Formosa was, it is well known, due to the energy of an English merchant, Mr. Dodd, who started the industry in the island. The thing has passed, by inexorable competition, into Chinese hands; but a certain continuance of the good tradition which he inaugurated has maintained for Formosa teas an exceptional character that had secured them so far, against the disasters that have overtaken the trade on the mainland. The export from Tamsui, last year, showed, however, a decrease of 560,000 lb. and the result seems due to the same causes which are so largely responsible for the misfortunes of the China trade.

The teas of the island are, we are told, rapidly losing their distinctive character, owing to the reckless competition amongst Chinese buyers for the Amoy Market, and the careless preparation and fraudulent admixture by them of the teas after they come into their hands from the growers. This has told its tale on the consuming markets, and a lower basis of price than has ever been known before has been established, while the consumption shows a very marked decrease. With the yearly increasing competition from India, Japan, Ceylon, and Java, each of which countries fosters its tea trade, while China does nothing for it, but rather taxes it beyond its endurance, the ground that Formosa has lost on the consuming markets is unlikely ever to be made up; and in the opinion of those most competent to judge, the days of the trade are numbered, unless steps are taken by the Chinese themselves in the direction of radical reform. Under these circumstances it is gratifying to note that his Excellency the Governor has, in conjunction with a foreign merchant, procured the services of an experienced planter from India, who is to establish a model tea farm, and endeavour to show the people the advantages of the proper cultivation

and manufacture of tea. The idea is an enlightened one, but whether it will be prosecuted with vigour, and receive enough official support to ensure its success, remains yet to be seen. It is also an open question whether the adoption of the most perfect methods can be attended with success while the inland and export duties on the article continue to be out of all proportion to its value, and so far in excess of the like imposts in all competing countries.

The paragraph is so pertinent that we have reproduced it at length; though wo have left ourselves, in doing so, little space to review various other features in the reports that invite comment.—*L. and C. Express*, May 23rd.

NOTES ON PRODUCE AND FINANCE.

SILVER—TEA—PEPPER—COCOA—COFFEE.

The rise in the price of silver, and effect of American legislation on the value of silver, are events which are keenly watched by those interested in tea. Undoubtedly the depreciation of silver has stimulated the export of Indian produce, and every rise in the price of silver tends to check exports from India. The exporter from India sells what he exports in Europe for gold, and cheap silver means that he gets more rupees when he exchanges his gold. In addition, there is the enhanced cost of production. Tea has benefited considerably by the depreciated rupee, and the rise in its value, should that advance be considerable, will be anything but a matter of congratulation to garden proprietors. They must look for a rise in prices at home and a lowering of freights to compensate them. That which will prove a blessing to the Indian Civil servants is not likely to be regarded as a boon by Indian exporters.

Those who are responsible for the reports and accounts of tea companies must mind what they are about. The *citizen* has its eye on them, and if there is any weak point in the armour of their accounts our contemporary will doubtless discover it. The Balijan Company has not escaped criticism, and even the directors of the Dooars Company are reminded that 'the figures (of the report) are not convincing on the point of the 'far more' value of the estate. The estates comprise, according to official authority, 10,500 acres, and the cost per acre of about a third of this number is no proof of the present value of the whole acreage. If the directors will provide, as they should do, the particulars of the estates generally, in addition to the information they have given in the report, a better opinion could be formed upon the matter. It should also be stated in future reports that the preference shares are entitled to a cumulative dividend and priority in repayment of capital."

Those who find it profitable to adulterate Pepper are fertile in their application of adulterants. The latest is a composition consisting of the following ingredients—namely, rice-starch, chalk, barytes, and lead chromate—which are all reduced to a very fine powder and intimately mixed. The following is suggested as a useful process of treating a suspected sample:—Let a portion be well shaken with chloroform; this will give the mineral ingredients of the adulterant in their natural combination. The residue is well washed and then gently warmed, until every trace of chloroform has evaporated; it is then treated with a few drops of sodium carbonate solution, and allowed to cool. Having separately shaken a little ether with some aqueous hydrogen peroxide, a few drops of the prepared ether are added, and the mixture carefully acidified with hydrochloric acid. A delicate blue colouration will thus be obtained, and the barium and the lead can then be estimated by any of the usual methods.

During the delivery of the Cantor Lectures at the Society of Arts, the lecturer displayed a table showing the variation in the consumption of alcoholic and non-alcoholic drinks and sugar from 1856 to 1888. TEA had jumped from about 65,000,000 to 185,000,000 pounds; coffee had fallen slightly, sugar and cocoa showed almost a parallel rise, each faster than that of the population; spirits and wine rose rapidly until 1873, and beer until about 1876, since which time they had as steadily declined.

In 1873 the British East Indies sent us 20,326,882 lb. of tea; in 1889, 127,160,409 lb.; China meanwhile had fallen from 133,307,196 lb. to 88,848,574 lb. Our total imports were 162,344,395 lb. in 1873, rising steadily to 221,602,660 lb. in 1889. Corresponding figures for consumption showed 132,022,155 lb. in 1873, or 4·1 lb. per head; in 1889, 185,621,800 lb., or 4·9 lb. per head. In the Australian Colonies 7·66 lb. per head were consumed in 1884 5; in Spain, ·01 lb. A large and varied assortment of teas—including brick tea—was on view.

In his lecture on "COCOA" before the Society of Arts, Mr. Bannister said there was great difficulty in understanding how the name *cacao* had become changed into cocoa. Linnæus was so much struck by its properties that he regarded it as fit drink for the gods, hence naming it Theobroma Cacao. When Cortes visited Mexico, he found the cocoa beans being used as money, and one writer of his time remarked that it was better to have such money than silver and gold, for no one could possibly hoard it up, as it would not keep. The Emperor of Mexico received it as a tribute from various parts of the country, and he was said to have had no less than fifty pitchers prepared for his own use daily, so that, however small the pitchers were, he must have had great taste for it. The consumption in Mexico was very large, and it was said that about 2,444,000 cwt. were used, which must, however, have been an exaggeration. In 1806 from six to nine million pounds were used in Spain, and from fourteen to seventeen millions in the rest of Europe. In 1662 it was sold in London at 2s per lb. Clubs, where it was largely used, were formed, one of which was the Cocoa Tree Club in St. James's. These clubs became divided into Whig and Tory ones, and eventually deteriorated into gambling clubs and places of resort where the drinks were no longer of the non-intoxicating kind. There was a large proportion of fat in cocoa, the Trinidad variety possessing as much as 51·77 per cent. This was taken objection to, and starch and sugar was added to let down the quantity. The cocoa plant belonged to a very strange class of plants. The leaves grew at the ends of the branches, and the pod, or fruit, hung from the thick stem or trunk of the tree, and it was no uncommon thing to see ripe pods and flowers on the same stalk. The pod contained from thirty-five to forty seeds, enveloped in a soft pulp, which was often used by the natives as food. The process of fermentation to which the fresh gathered seeds were submitted was of great importance, as it not only removed the slimy substance surrounding the seeds, but it also tended to remove much of the bitterness of the seeds themselves. On reaching this country the seeds were roasted and the husk removed, leaving what was known as cocoa-nibs.

When cocoa was first introduced there was much difficulty in preparing it for drinking, owing to the thinness of the liquor and the amount of fat which rose to the top. Then some clever person thought of adding starch, which had the property of holding the cocoa in suspension, and so giving more body to the liquor. The next point which arose was how to make a cocoa free from starch and sugar, and yet t be soluble. They found that it was necessary to remove a considerable amount of the fat, which was done by grinding it in a warm mill, which caused the fat to melt, so as to be extractable by pressure, so that the percentage of fat was reduced to from 23·38 to 29 60. Flake cocoa, cocoa extract, chocolatine, and the nibs themselves contained starch or sugar; while the Iceland moss cocoa, of all prepared cocoas, contained most, as there was only 23·74 of non-fatty cocoa present. Chocolat de santé contained 2 per cent. of starch, 61·21 of sugar, and 13·27 of cocoa. A further step in the manufacture of cocoa was the addition of alkalis, such as ammonia or potash, by which it was rendered soluble. The drink prepared from cocoa was a bland and wholesome drink, and there was a chance of its taking its position among the non-alcoholic drinks. When made into a sweetmeat it was far preferable to an inordinate use of sugar, and such a use was to be encouraged rather than condemned, as it nourished rather than

fattened, and was more wholesome than sweets. Passing on to deal with chocolate, the lecturer said that the derivation of the word was difficult to trace and the only suggestion that seemed to be at all valuable was to the effect that when the Mexicans ground the cocoa up with starch and sugar for the purpose of making chocolate, the pestle made a peculiar noise in the mortar which they tried to imitate in their speech by the word "chocolate." The chocolate which was supplied to the Navy contained 80 per cent of cocoa and 20 per cent of pure Demerara sugar. Chocolate creams were made of sugar and glucose spread over with a paste of chocolate—a process which was mostly done by hand. The quantity of cocoa imported into this country in 1873 was 19,661,247 lb., and the consumption was 8,311,023 lb. or 26 lh. per head. In 1883 the three quantities had risen to 22,632,694 lb., 12,868,170 lb., and 36 lb.; and in 1889 the quantities were 26,735,974 lb., 18,464,164 lb. and 48 lb.

In his lecture on COFFEE Mr. Bannister said that the chemistry of coffee was particularly interesting as affording a comparison of the beverage with tea. The almost entire absence of tannin fitted it admirably for after-dinner use. The presence also of fatty and oily substances rendered it to some extent a true food, while the alkaloid-caffeine C_8, H_{10}, N_4, O_2—performed the function of a nerve tonic of the greatest value. Coffee, when properly roasted, did not suffer much loss of the most valuable constituents; the amount of caffeine usually present in raw coffee was about 1-1·3 per cent. and in roasted hardly less; in an ordinary infusion, 3 fluid ounces were reckoned to contain nearly 2·5 grains of caffeine. Naturally, the roasting of coffee was an operation requiring great skill and judgment. A good roaster must understand the peculiarities of the different kinds of coffee: some were tough and more moist than others. The perfectly roasted berry was of a rich chestnut colour, it had lost its toughness and become crisp, so that it readily disintegrated in the mill, and at the same time it had not that dark brown tint, which meant that it was over-roasted. However good the quality of the original coffee, over-roasting spoiled it. It might give a darker liquor, but it possessed little or no aroma, and had destroyed the natural constituents which make up the quality of good coffee. When properly roasted it lost 16 to 18 per cent. of its weight, mostly moisture, but in addition the constituents of the berry had been modified, and an aromatic oil was produced which had an intense flavour. A judicious blend of different kinds of coffee always produced a better liquor than any single coffee, but this mixture should always be made after roasting. The cooling of the roasted berry was also a very delicate operation.

The steady falling off in the consumption of coffee proved beyond doubt that coffee was not a popular drink, one reason, perhaps, being that its preparation for the table was more complicated than that of its rival—tea. Thus in 1873 we consumed 288,669 cwts., or 1.01lb. per head; in 1889 this had fallen to 259,279 cwt., or ·76lb. per head. The total imports fell in the same period from 6,183,678 cwt. to 1,040,606 cwt.

A French professor claims that he has almost succeeded in producing artificial silk, which should render us independent of the silkworm. He says all the constituent materials of silk are to be found in the mulberry-leaf, upon which the silkworm feeds.

THE MERCHANDISE MARKS ACT:—CEYLON TEA.

In a few months' time we are promised a wave of litigation under the Merchandise Marks Act, more especially in connection with the adulteration of the three breakfast table beverages of tea, coffee, and cocoa. But a short time back, one offender was fined the small sum of £10 for selling "Sogama" tea. The inside of the packets containing the so-called Sogama tea was in reality a mixture of cheap Indian and China teas. This, at all events, was the opinion of Mr. W. J. Thompson, whose experience has extended over thirty years. Mr. Avory, for the defence, denied that Messrs. Paget and Pigott, tea dealers, of 36, Middlesex-street, Whitechapel, had any intention to defraud. The tea was sold in packets bearing the brand of "The Sogama Estate." The Ceylon Association having ascertained that tea, bearing falsely the brand of the Sogama Estate, was being sold by certain persons, communicated with the company owning the estate, and the proceedings naturally followed. Some mention was incidentally made of a Sogama "District." To anyone connected with the planting enterprise of Ceylon such a theory is peculiarly, not to say amusingly, absurd. The names of the districts in Ceylon are naturally in the Singalese language, whereas Sogama is clearly a Tamil word meaning "quite well," from *sogham*, health. We have known the estate for the past ten years, together with the entire district of Pussellawa, in which it is situated, and feel perfectly sure that its tea fully deserves the good price which is paid for it in the Lane. Mr. Bushby, in giving judgment, said the label "Sogama Estate" too distinctly misled the public, and that it was a serious evil which must be put a stop to. He imposed a fine of £10 and allowed 25s costs.

Now, this case is merely to be the forerunner of a dozen similar ones. For the protection of British-grown tea, the Ceylon Association in London intend to commence actions against other manufacturers of choice blends and mixtures, many of which are conspicuously labelled "pure Ceylon tea." That which we particularly desire to ask those of the public who may find themselves called as jurors in any of these cases is whether or not such an expression as "principally pure Ceylon tea" is or is not an actual contradiction in terms. To us it gives the most perfect example of oxymoron that the English can present, and would, we are sure, have been used by Mr. Lindley Murray in his grammar had he lived at the present day. No mention need be made of the fact that the word "principally" is printed in small letters in order to give that deceptive complexion to the label which is so profitable to the tea dealer and so disastrous to the palate and pocket of the small and ignorant consumer. Can we talk of diluted neat brandy, of alloyed virgin gold? We, indeed, hear of real paste diamonds and of real mock-turtle soup, but believe no harm is done by these terms; but the coupling of two such word as principally pure is, to our mind, wilfully misleading, besides being nonsensical. Surely "pure Ceylon tea" cannot be guarded in any way. If it is pure, then, what is the use of the word "principally"? If it is not pure, the word is nothing more or less than a lie.

As the law now stands, tea dealers can drive a coach-and-four right through it in every direction. The subtle alteration of a single letter can be made with impunity, with the effect of giving the public the idea that they are buying tea from the advertisers at fully 6d. a pound reduction on the price charged by other shops. So far, indeed, is this carried that if only the public were not, as Carlyle averred, "mostly fools," they would see that the tea offered them must be sold at an average loss of about 3d. a pound to the advertisers. "Sogama Estate" tea is only one example of the many frauds that are printed. As we have said, the usual plan is to seize upon the name of a well-known district or estate, such as Kaltura or Mariawattie, and to alter one or two letters. A large label is then affixed, with the false word well displayed, and guarded by a small-typed "principally" or "blend." The *mala fides* of this is so apparent that any judge on the bench or any twelve men in the jury box would be bound to give a verdict against the advertisers. Mr. Goschen, in his Budget speech, advised the poorer tea consummers to exercise more care with regard to the tea they bought. But he omitted to tell them how to set about doing so. Like Dr. Johnson, he can find them facts, but he cannot find them intelligence. When anyone sees the word "pure" printed in large letters on a packet, we think he should be able to obtain redress in a court of justice as soon as it is owned that the contents are not pure, or, in other words, are pure adulterations. We have in this office six different packets of so-called "Ceylon tea," the labels on all of which are, in our opinion, gross frauds on the public. They have been carefully prepared

under the eye of an unscrupulous solicitor, no doubt in order to fit well into the joints in the harness of the Merchandise Marks Act. The sooner this Act is enclosed in a new suit of armour the better for the public, and we will heartily coöperate with any association which has so meritorious an end in view. —London *Citizen,* May 20th.

SOME STRANGE AMERICAN TRADES.

Nobody can travel long in America without noticing the sign-plates of many curious occupations. Artificial ear-makers, nose-restorers, leg-stretchers, sermon-writers, prayer-makers, child-adopters, salad-mixers, lamp-attendants were among the various businesses brought to my notice during a three-hours' walk this morning up town (writes a contributor to *Galignani*), by burnished brass signs on door lamps or bold lettering across the fronts of houses.

The artificial ear, nose and cheek-restorer came into existence shortly after the close of the Civil War. The disfiguring wounds of many soldiers taxed the ingenuity of the medical profession, and it was not long before advertisements in the public papers announced that Dr. So-and-So was able to repair all ravages by sword and shot. Many an old soldier with his nose shot away by a bullet, or cleft in half by a sword, willingly welcomed these announcements, and it is said that in the first few years after the war the spectacle of a man with a wax nose attached to a pair of green eye-glasses, was so common that it was hardly noticed. In the present day, however, a man's nose can be duplicated without the artificial attachment to his face being detected except on the closest scrutiny. I was talking to a gentleman whom I met in the office of an artificial ear-maker on this very topic. He was a man with a singularly sweet voice and a heavy black moustache beneath his delicately chiselled nose. "You are right," said he, "in saying that science has learned how to become almost a twin-brother to nature. Do you notice anything peculiar about my face?" I confessed that I did not, and he laughed as he said, "look here." He then put his finger in his mouth and touched something in his upper palate. The next moment his nose fell into his hand, a false palate dropped out of his mouth, and there he stood speechless and horribly hideous, with a deep hole in his face where his nose should be. The next moment he pushed the nose back ; it was made with a shaft stretching into the skull. Then he put back the palate and fastened a small bolt connected with the nose-shaft, and again he was as good-looking a man as you could find in all New York. "You look amused," said he ; "but I assure you that until my doctor succeeded in making me presentable I was not only the frightful sight you just saw, but, although I can speak six languages, I could not make myself intelligible in a single one. At the Battle of Cedar Mountain a ball went through my nose and upper palate, destroying both." Soldiers are not the only people who go to the feature-restorers for help when disfigured. Thin women succeed in having made cunningly contrived paps for their cheeks, and persons with hare-lips sometimes have the whole of the lip cut away and a false one substituted.

Ear-makers confine themselves to their own speciality. Ears are frequently lost in America in personal fisticuffs, for there is nothing your American enjoys more than a good chew at the ear of an antagonist, not to speak of the chance to slash it off with a bowie knife or a razor. Ears are also frequently lost through frost-bite. The restorer models them cleverly out of plaster of Paris, taking the remaining ear as a copy, then makes them from a composition of wax, India-rubber, and a peculiar sort of gum, and affixes them by rubber suction to the side of the head. A family living in Illinois, which happened to be blown up on account of incautiously residing in the vicinity of a powder magazine, has only three noses and two ears between its members ; nor has any member of the family, which consists of parents, three good-looking girls, and two strapping young fellows, more than one eye. Nobody would suspect any of these defects at a general glance, for the ear-maker, the nose-restorer, and the glass-eye manufacturer worked over the scorched and badly shaken family for weeks after the doctor had finished treating them for their burns.

There is a dentist on Broadway who calls himself a "tooth transplanter." This gentleman's occupation is as ingenious as it is romantic. A pair of lovers will go to him who are about to be separated for some time. Side by side they sit with open mouths in the surgery while he draws out a small and sound molar from the young man's jaw, and then immediately draws out the largest and soundest from the young lady's. The dentist then quickly inserts the feminine tooth in the masculine gum and the masculine tooth in the feminine gum, and in a day or so the two teeth are fixed as comfortably in their foster mouths as though they had grown there always. The tooth transplanter's charges are a a little high, and sometimes he is called upon to undo his own work. He told me an amusing story. Last October a fine dashing young fellow about to join his cavalry regiment on the frontier, came with his sweetheart, a lovely little blonde, and requested to have their teeth transplanted. The job did not take long, although there was some little difficulty in drawing a tooth sufficiently small out of the officer's mouth to fit the girl's gum, and she suffered no little pain during the operation. She could not be induced to take ether as she said it would spoil the romance. In February the young lady came again, but alone and in tears. "She rushed at me," relates the dentist, "crying 'Take it out, take it out; he is a wretch and has deceived me.' I recalled her face readily, but I insisted on hearing her story before removing her sweetheart's transplanted tooth. And I was quite moved," continued the dentist, "by her recital of the infamous manner in which her cavalry lover had suddenly ceased corresponding with her and deliberately married the rich widow of an intemperate Lieutenant-Colonel. I took out that tooth, and advised her to write to her recalcitrant lover and insist upon her own tooth being restored to her. I hope he was well wrenched in the operation."

Leg-stretchers are men and women who fix their patients in a species of rack for an hour or two a-day and chafe the arms and limbs with weak whisky-and-water. Six months of this treatment will ensure an extra inch or two of height ; but the operation is tedious and painful. Short men engaged to tall girls are the best paying customers for this business. —*Pioneer.*

THE SILVER INDUSTRY.

[BY JOHN RICHARDS.]

During the last four years this new industry has made most marvellous progress, and may now be classed as one of Australia's chief sources of wealth. Its rapid and profitable development has lifted hundreds from comparative poverty to affluence, and has enabled thousands of miners, smelters, and labourers to earn a comfortable livelihood, besides

benefiting indirectly moro or less all classes of the community. It is quite on the cards, judging from past progress, that in less than twenty years the output of silver will exceed in value any one of our long established staple products. This year I estimate that about three and a half millions sterling worth of silver and lead will be exported. A question of vital importance to all, but more especially to the silverminer and wheatgrower is. Will the metal maintain its price? It may be asked, how can the price of silver affect the Australian wheatgrower? That it does affect him will bo presently shown. During the last few months silver has had a most remarkable rise. For about two years prior to the late advance the average price was a little over 3s 6d per oz. A few weeks ago it touched 4s, the present quotation being 3s 10½d. The main cause of the rise is no doubt the Bill introduced in the Senate and House of Representatives of tho United States in February last, which virtually provides for the free coinage of all the silver (about half the total product of the world) produced in that country. Another cause is Mr. Goschen's proposal to abolish the heavy duty in Great Britain on silver plate, which will undoubtedly, owing to the beauty and durability of the metal, bring it into moro general use. One of the principal reasons given for introducing this Silver Bill is the growing scarcity of gold, which means dear money, and that the expansion of trade and rapid increase of the world's population requires a much larger metallic currency. The United States has 426 millions of dollars (over £85,000,000) of paper money commonly called uncovered notes, behind which there is no gold or silver or bullion.

Now I will try to explain how cheap silver keeps down the price of wheat, the great staple export of this colony. The European market for foreign wheat is supplied chiefly from the United States, India, Russia, Argentine Republic, and Australia. Before the demonetization of silver in Europe in 1873 the value of the rupee there was two shillings in gold, six months ago it was only worth 1s 4d, but in a silver standard country like India the rupee lost none of its purchasing power owing to the adoption of the gold standard by the principal commercial nations of the world. India sends to Europe one million tons of wheat yearly. A person who wishes to obtain wheat in India can procure enough silvor to mako two rupees for 2s 8d; with it he can buy a bushol of wheat in India to sell in the English market in competition with the Australian farmer who must sell his wheat for the equivalent of two rupees in silver, or, what is the same thing, 2s 8d a bushel in gold. Silver being the only legal tender in India the Indian wheat-producers have experienced no material change in the price. In a late *New York Tribune* Senator Stewart writes—"The silver standard countries have ample resources to supply the European markets with all farm products. Why is it that all the silver standard countries continue to increase their exports of farm products, while the gold standard countries are compelled to surrender the markets of Europe which they have so long enjoyed. In 1880 the United States furnished 60 per cent. of the quantity supplied; in 1888 9 our country sent less than 23 per cent. The Australian Colonies are on the gold basis, and suffer equally with the United States. Theso colonies in 1880 sold in the European markets over 13,000,000 bushels of wheat, while in 1888-9 their contribution was reduced to 4,500,000."

Australia being the only silver-producing country of any importance in the British Empire, and, barring the United States and Mexico, producing more silver than any other country in the world, she has a perfect right to make her voice heard in the great bimetallic controversy that is now agitating England, tho Continental nations, and America. Australia should use every effort to induce England to return to her old bimetallic currency, which would make silver a legal tender for any amount. The recent rise in the price of silver is mainly owing to wise legislation, and Australia, so far as possible, should follow in the wake of America. A rise of only 4d an ounce means an extra profit to one Australian mine alone of £2,500 a week, or the dividends increased by £130,000 a year. This 4d an ounce may also mean the difference between struggling Companies making a call or meeting expenses. It may be argued that an advanco in silver and increased dividends only add to the wealth of the lucky shareholders, but a good proportion of this increased wealth is bound to circulate in one form or another. The higher the price we get for any of our staple exports the better for all classes. The mine-owner cannot enrich himself without enriching others. His wealth is taken from the ground and by his enterpriso the country at large is made richer and no individual is made poorer. Very different to the man who speculates for a rise in sugar or wheat. His gain is another man's loss. Again, it may be said that if a high price for silver means a higher price for wheat, would that not be rather rough on the people of wheat-importing countries, such as England? No doubt it would; but, as a rule, nations like individuals generally act from purely selfish motives. The paramount duty of the legislators of any country is to strive to increase tho prosperity of that country. And if this desirable result is accomplished how such legislation affects other nations is a matter of very secondary importanco.—*Adelaide Observer*, May 10th.

PLANTING IN NETHERLANDS INDIA:

JAVA TEA, BANTAM PEPPER, SUGAR.

The present low quotations for Java tea have stirred up the planters there to put their house in order. The fall in prices has long been in operation and, all through last year, the situation remained unchanged. The planters, taking the alarm, set to work growing the Assam variety of tea in preference, and introduced sundry improvements in machinery and appliances. The fall in Java tea, properly so called, arises somewhat from quality being sacrificed to quantity, but growers' profits have been materially reduced even for superior kinds by the low rates offered by retail tea dealers in Europe. To remedy this, the planters have taken steps to start retail tea dealing on their own account, and they have also set about increasing the sale of the article in the island itself.

In Bantam, pepper cultivation, formerly a leading industry, has fallen off considerably through suitable land for carrying it on abounds. The people migrate elsewhere to work as labourers on pepper estates but shrink from growing it themselves, owing to difficulties attending the transport of cuttings and the mode of planting them out, which requires a particular kind of timber for poles hard to get. To meet the difficulty the Government has decided upon starting an experimental pepper garden there, which will also contain trees suitable for poles.

The Botanical Garden at Buitenzorg affords a striking instance of how Nature sometimes mocks at theoretical science. Scientists there put out by the canker attacking the sugar canes in Java, determined to experiment upon it by planting in an enclosed piece of land sound canes and stricken ones in alternate rows to find out how the disease spreads and its mode of attack. The plants were left to themselves until the day of examination, when tho scientists found, to their amazement, that the diseased cane had not infected the sound ones, and that just the opposite had taken place by all

the sickly cane becoming healthy. Meanwhile the planters set great store by plant cane from abroad, and the Governor-General has been empowered to authorise its importation in vessels flying foreign flags.

The *sirih* or betel leaf, so much in demand among natives for chewing purposes, has been found on analysis in Europe to contain useful medical properties. The leaves produce a kind of oil which yields an active principle going by the name of *Chavicol.* Experimenting with the latter in a laboratory at Amsterdam has shown that Chavicol is a powerful antiseptic against bacteria, and is five times stronger than Phenol.—*Straits Times,* May 28th.

REMARKS ON THE STATE OF BOTANY IN CEYLON,

WITH REFERENCE TO THE KNOWLEDGE OF IT IN APRIL 1843, AND AN ATTEMPT AT ARRANGING ITS FLORA AS KNOWN TO MOON AND RESIDENT BOTANISTS ACCORDING TO LOCALITY AND ELEVATION, COMMONLY CALLED GEOGRAPHICAL DISTRIBUTION OF A FLORA.

BY CAPTAIN CHAMPION, 95TH REGT.*

On first arrival in Ceylon our Botanical griffin will feel very fairly puzzled as to what he is to regard as new and interesting in the vast mass of green jungle stretched before his wondering eyes. It may be that he can distinguish a Cocoo Palm from a Jack tree at first sight, and if he has common intelligence he will shortly become acquainted with the mysteries of eating the various fruits served on the dessert table, and perhaps even enquire after tho trees upon which they are produced, in which case I would recommend his consulting his black Appoo, as he may not always be successful in elucidating a correct answer from his companions of the preceding evening.

However this may be, a great deal is to be said respecting Coco-Palms, and Betlenut, Pumplemos and Forbidden fruit, the Bread fruit, Indian-rubber tree, the Banyan, Cashew and half a score more, and if he has not previously in England been the possessor of a little Pitcher plant, hermetically sealed and restricted to the last watering of the Hot-house gardener for six months to come, this pretty plant may be pointed out to him as one of the wonders of the Coast :† but here knowledge closes her ample store, and if he has not perseverance to wade thro' Lindley, Moon, Wight and Arnott, Roxburgh, and a few other tomes, studded like the sands of the seashore with hard names, he will have finished his education in six months, and know as much of botany as most of his neighbours do.

Economy and utility are the order of the day. Who has been in the interior and seen Sugar Plantations, and Coffee Gardens and Coolies clearing, until Coolies are scarce, and will not say that Mammon is hard at work; there is nothing like English labor and industry, and this we will say with three cheers whether in Ceylon, or the Park, or on the Thames with her forest of masts.

Ceylon is a moneymaking land, and many come out to make money and to live to save, but a few are here for a few years, and care less for money and more for agreeable society, and the many charms of the good old land; these regret to find but little of the dulce and society at a low ebb for we are all in the jungle, and just so many Robinson Crusoes with our man Friday.

To the latter it will be no small pleasure to do as we have done in England. History, Literature and the Arts can agreeably vary the usual routine of life, let me also suggest Horticulture and her twin sister Botany, for its knowledge will enrich your grounds and house, with many a pleasing object, and pass many a dull hour whilst even the monotonous jungle becomes a source of delight.

(*To be continued.*)

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* Who, as Col. Champion, received his death wound, while leading his regiment in a charge during the siege of Sebastopol.—ED. *T. A.*

† The demands of visitors has led to the extirpation of the pitcher plant in the Colombo Cinnamon Gardens, where once it specially abounded.—ED. *T. A.*

SAPPHIRES IN KASHMIR.

Many persons will remember the discovery of a sapphire mine in Kashmir about nine years ago, writes a Calcutta contemporary, and the absurdly low prices at which the hillmen who first brought the gems to Simla were willing to sell the precious stones. The Maharaja of Kashmir was not long in placing a guard over the mines and raising a profitable revenue from them, and since then the work of collecting the stones has gone on from year to year. The spot where the sapphires are found is near the village of Soomjam on the Bhutna river. It is a small upland valley about 1,000 yards long by 400 yards broad, and is thirteen marches from Srinagar. There are clear indications that in former times glaciers covered the whole of this region, but now they only descend as far as the upper end of the passes leading into Zanskar. About a hundred coolies are employed in working for sapphires, and the method at first employed was merely to dig up the surface of the earth and search for stones. At present, however, the earth is being washed in a spring close at hand, and by this means better results are obtained. The largest stone found in 1887 weighed about six ounces, and was partly of a very brilliant colour. In 1888 the largest stone only weighed 104 grains, and very few were found weighing more than 50 trains. These, however, are not to be compared with the stones brought down when the mine was first discovered. There are at present in the treasury at Jammu some of the first stones discovered measuring five inches in length by three inches in breadth, and though none of them are uniformly coloured but are shaded off into white at the ends, some fine gems might be cut from them. During the working season of 1888, that is, from the 17th July, to the 29th Sept., the total quantity of corundum obtained from the mines was 1,630 tolas, of which perhaps one-fourth would be commercially valuable, but the average weight of the stones was not more than ten grains. The beds, in fact, appear to be getting exhausted and before long the working may cease to be profitable.

Besides corundum other minerals interesting from a scientific point of view, but not commercially valuable, are found in the granite of this region. Though several attempts have been made to discover new localities for sapphires, is in the region they have hitherto all proved unsuccessful, with one small exception. This was a block of granite found near one of the passes into the Zanskar which contained some stones of good size but poor colour. There was no doubt that this block of granite which is the only one visible in the locality had once formed part of the cliffs surrounding the head of tho glacier. It was lying at a level of about 15,500 feet above the sea, and probably came from some point which was much higher and perhaps inaccessible. There are other places in Kashmir where rock crystal, iron ore, and other minerals exist, but none of them are worth the trouble of mining. There are also iron-works at Srup in the Kashmir Valley. The outcrop from which the ore is obtained extends for a distance of at least two miles along tho hill side, and is sufficient to keep the small native furnaces supplied for many years to come so long as there is any demand for iron, but the ore is said to be of poor quality, and there would be no opening for large blast furnaces on the English plan. A good deal has been said of late regarding the great mineral resources of

Kashmir. It may be interesting, therefore, to refer to some remarks on the subject by Mr. T. D. La Touche, of the Geological Survey of India. He writes that in speaking of mineral wealth which might be brought to light by properly conducted prospecting it does not seem to be taken into consideration that the natives of the country have for ages had opportunities of discovering what minerals the hills contain. Even the Khasis of Assam have for years obtained iron from the granite of their hills, where a highly trained European geologist might have been sceptical about finding it. It cannot be doubted therefore that if minerals exist in Kashmir they are known to the natives. Accident may occasionally bring rarer minerals to light, as in the case of the sapphires, but then even an intelligent prospector might search for years in the mountains without making another such discovery.—*Morning Post.*

THE CYCLONE IN QUEENSLAND.

(*By an ex-Ceylon Planter*).

I was at Woodlands at the beginning and at Bicton during the full brunt of the cyclone. Such a crashing and tearing up of vegetation it is almost impossible to imagine. The scrub or jungle is thoroughly torn up by the roots or denuded of tops and branches; trees two and three feet diameter torn up by the roots and laid flat are not uncommon. Earth-slips here and there on the mountains and creek banks washed out to sea. The following day at an elevation about 200 feet, and as far as the eye can see the ocean looks one huge mud-hole strewn with wreckage from the forest. Woodlands house had a very narrow escape, a two-story building; the lower story is tilted over to nearly an angle of 30 degrees while the top story stands erect giving the house a peculiar kink in it; their kitchen and stove, also a two story building, went smash to the ground as also the Kanakas' huts. No life lost or much injury farther than a few scratches and a cold wet rough night of it out in the open. Two young ladies there, neither very strong, must have suffered keenly for they had to fly from the falling houses short of clothing and without any blankets, camping all night among the pineapples. At Bicton where I was, the early part of the night, a continuous hurricane with rain in torrents blowing through into the house until the whole place was well saturated, when shortly after midnight away went the roof of the dwelling-house with a noise stupifying. The four inmates afterwards scrambled out to the kitchen and dining-room and came in there fairly well clad and blankets; they fearing this house would go made for the packing shed at the beach, and took up shelter there, leaving another and myself in the dining-room; we stuck there until the roof and timbers were flying and falling a window blown out and out went I at it, escaping underneath the floor of the dwelling-house and had to cling on to the blocks in about 10 or 12 inches of water for about two hours, afterwards we scrambled on to the beach shed where we found the other four with a fire and camped there until daylight.

R. C.

PLANTING IN QUEENSLAND.

(*By an ex-Ceylon Planter.*)

CACAO AND LIBERIAN COFFEE.

Our agri-horticulture has suffered terribly through cyclone, insect pests, rats and the worst of the weather. I am hopeful and able to record that we now have a cacao clearing in Australia thanks to Messrs. Darley, Butler & Co. of your verdant isle; theirs were the only importation of cacao pods that seed germinated out of six lots. (This day, mail day, I expect another and final lot from A. H. T., Esq.) I lost a good few with the cyclone, and the jungle rats also misbehaved by breaking and eating some of the seeds as they germinated. Now the weather is fine we look for their rapid progress. Cacao and Liberian intermediate quincunx fashion; they are now up to a foot high and look fair, healthy plants. I do not look for this industry to be of much favour with the noble working man of Australia, and in fact would not again attempt the pioneering of this product for a trifle; if I had not had enthusiasm it could not been carried out, for loss after loss, disappointment after disappointment, and your best and constant energy overthrown, was enough to turn the head of an iron man. However it is now a fact in the land of the noble working white man; query is not "noble" misplaced? Years will tell. This clatter of unions, strikes and equality tends to degenerate the white man. I am afraid the race will soon be in decade, their glass of prosperity is running very low. Unless a change comes soon you will find the colored and mixed races more prosperous, honest, virtuous, God-fearing and vigorous than the whites; instance the little colony, the Pitcairn Islanders.

MYSORE EMERY.—Some months ago, the *Bangalore Spectator* mentioned the fact that large quantities of corundum or emery were to be found in the Goribidnur Taluk, Tumkur District, Mysore Province, and that the right to collect this mineral was leased out to a native by the Government for quite a nominal sum. Our contemporary's remarks attracted the attention of a Bombay firm, who sent home a trial shipment of Mysore emery, which fetched almost double the price of the best Grecian emery. Agents are now in Bangalore endeavouring to place orders for this material, so that the price in the local markets has gone up 50 per cent. It is believed that this mineral could be profitably mined, and the large number of old corundum mines, near Banavar, in the Kadur district, is pointed to as being a likely spot.—*Indian Engineer.* [In Ceylon, also, corundum of no value by the gem test ought to be profitable as a metal-polishing substance.—ED. *T. A.*]

BARLEY-GROWING on the Nilgiris, unlike many other similar experiments inaugurated or fostered by Government, is beginning to show a fair promise of future success, which must be exceediulyg gratifying not only to Government but to the local Brewery Companies who have done so much to popularise the crop amongst the Badagas. Liberal prizes are being annually given by Government for the best samples, and these are further supplemented by generous contributions from the Murree and Arvanghat Brewery Companies. The competition for and award of the prizes for last season's samples form the subject of an interesting report recently submitted to Government by the Collector of the Nilgiris. The total awards for last season's samples amounted to a sum of R295, which was equally divided amongst the three "nads," namely Todanad, Merkunad and Paranginad, three prizes being given to each. The samples exhibited were generally of a most satisfactory character, the majority of the thirty-nine from Merkunad being regarded as "of excellent quality and difficult to separate." All the samples for which prizes were given were grown from English seed and during the present season only, due care having been taken to exclude old samples. The good quality of locally grown barley is testified in a letter addressed by Messrs. Leishman & Co., to the Collector of the Nilgiris, in which they say:—"We are very pleased to have the honor to inform you that this season's Badaga barley grown from English seed malts very well indeed. In fact we are so satisfied with the barley that we have given instructions to our barley contractor to purchase 2,000 to 3,000 bushels more if it is obtainable. The barley requires a good deal of attention during malting and the malt gives a very high extract." Such testimony as this cannot but be regarded as very satisfactory, and encourages the hope that barley cultivation on the Nilgiris has a prosperous future before it.—*M. Mail.*

THE OKRA PLANT.—Considerable attention is being directed to the okra plant, an annual of South American origin, which, heretofore, has been known chiefly as an excellent vegetable for soups. It has recently been discovered, however, that this plant has an excellent fibre, and an inventor asserts that he has devised a process for extracting okra fibre at a cost not exceeding one cent per lb. It is believed that okra fibre, especially if extracted at this price, will largely displace jute, and it is also likely to come into competition with henequen.—*Industries.* [The "okra" is simply the bandakai, and the "discovery" referred to is by no means "recent."—ED. *T. A.*]

PINE NEEDLE CLOTH.—We have already noticed the manufacture of cloth from Pine-needles as a promising young industry in some of our southern states. A correspondent of the *Atlanta Constitution*, writing from Wilmington, North Carolina, says that at a factory in a neighboring village may be seen specimens of colored mattings made from the "Pine straw," which are excellent in quality and also attractive in appearance, as the straw can be bleached to a fine creamy tint and readily takes brilliant dyes. But the machinery for making this matting lies idle, so great is the demand for coarse cloth for cotton bagging —*Garden and Forest.*

CINCHONA.—At the annual meeting of the Western Java Cinchona Agricultural Company the report was read, which shows that the cinchona prices were far from being favourable. Encouraging reports have been received regarding the estates, and the number of cinchona trees on the four undertakings is at present about 3,975,000, or 225,000 more than in the preceding year. On account of the low prices harvesting was confined as much as possible. The total gross proceeds of the parcels already sold is f.19,963, and the unsold stock on the spot and afloat is estimated at f.63,270, showing a total of f.83,233 appearing in the profit and loss account at a net value of f.65,083. The crop of 1890 is estimated at 150,000 kilos., and of 1891 at 220,000 kilos. 210 piculs of coffee were harvested. According to the profit and loss account, the balance profit, after writing off, amounts to f.24,092, including the balance of the preceding year, and consequently a dividend of f.24 per share, or 2 4-10 per cent can be declared.—*L. and C. Express*, May 9th.

"HEMILEIA VASTATRIX" IN AMERICA ?—If so, coffee is doomed in the Western world as well as in the Eastern. This is what we find in the *Rio News*:—

The following paragraph appeared in yesterday's *Telegram*:—The Jamaica papers publish the following: —"His Excellency the Governor, by proclamation, has prohibited the importation into the island of seeds or plants, or any description of earth or soil, or any article packed therewith, that may have come either directly or indirectly from the republic of Brazil." No reason is assigned for this prohibition. Standing by itself this paragraph seems extraordinary, and calls for some explanation—which we are happy to be able to furnish. The Governor of Jamaica, however, is evidently unaware that the Brazilian coffee epidemic, *hemileia vastatrix*, he is thus endeavouring to ward off from the island has already appeared in Central America. This is the more strange since the fact is already known in England, as the following clipping from the *West Indian* of London indicates:—The cultivation of coffee in Jamaica and some other islands of the West Indies, though on a smaller scale than formerly, is of sufficient importance to induce us to warn planters engaged in this industry of the undoubted appearance of the much dreaded and fatal *hemileia vastatrix*, or coffee leaf disease, in the states of Central America. How it was located in that part of the American continent is not within our knowledge; all we can do is to give timely warning to our West Indian planting friends who, if severely restrictive measures are not adopted, will assuredly find this most destructive pest amongst them before long, despite of expanse of sea between them.—Panama *Star and Herald*, March 8th.

THE BATAVIA *Nieuwsblad* says that the Java coffee crop this year will fall so short as to give rise to serious financial difficulties with the Government. The paddy crop too looks unpromising and the sugar yield is no better. "A deficit in the Budget looks alarmingly near, but the diminished tax bearing power of the impoverished people allows no hope of additional revenue."—*Indian Agriculturist*, May 10th.

BRAZIL.—Many complaints reach us from Brazil about the disastrous effects to the planters of the late slave emancipation. Some of the coffee plantations in the fertile district of Esperito Santo are utterly deserted by labourers, and are rapidly becoming overgrown with weeds. On others a few blacks still linger, and condescend to work for a day or two in each week, but very unwillingly. Similar conditions prevail more or less throughout the remaining provinces of Brazil, and a lare number of planters are threatened with ruin. Meanwhile there is some talk of forming associations for encouraging the influx of European labour. But white workers, besides being dearer, are not suited to the hot, moist climate, and are found very inefficient helpers on a plantation. Some means must be found either of coaxing or coercing the recalcitrant negro, or many a Brazilian planter will find himself deprived of the fruits of a lifetime of labour.—*British Trade Journal*, May 1st.

COCONUT BUTTER.—The *Times* Calcutta correspondent forwards a somewhat strange account of another new butter, the trade in which, he states, has developed to extraordinary dimensions in India. It is reported to be made from coconut milk, and to be pleasant to the taste and smell, and of a clear, whitish colour, free from acids, and easily digestible. The curious part of his story is that the coconuts are sent to Germany, there to have the milk extracted for the manufacture of the butter, one firm turning out. it is said from 3000 to 4000 kilograms daily. We know that so many millions of the inhabitants of India are strict vegetarians in accordance with their religious ordinances, that vegetable butter is finding a large sale there, and already one or two varieties of such butter have been referred to in these pages. It would be interesting to know whether the milk of the coconut could not be made into butter in India itself, instead of being transported thousands of miles to be manufactured in Europe ?—*British Trade Journal.*

ORANGE CULTIVATION ON THE NILGIRIS.—Besides the paper on Viticulture noticed by us the other day, Mr. Lawford has contributed one on the cultivation of the orange and other citrus trees in California. It is superfluous for us to dwell on the subject in detail, as the cultivation of oranges and limes, on the Nilgiris is carried on with marked success. Not an estate but grows scores of trees of this family; some of the very best varieties. They are planted either in avenues or scattered among the tea and coffee. Little of the fruit, however, benefits the proprietor as it is stolen and consumed by the coolies. On some estates orchards are formed and enclosed including orange trees marvellously prolific. As an example we may instance that at Billicul. The soil here is gravelly, but by years of preparation it has become rich and productive. The trees are umbrageous and healthy, sufficiently close to yield a dense shade, and when in blossom, the air is redolent with perfume and cool even during the hottest part of the day. The fruiting season extends from November to February, when the grove is a fine sight, every tree laden with thousands of the golden fruit, some of the branches so abundantly as to need propping up. The fruit at Billicul is mixed, but mostly of the thick skinned variety, juicy and sweet but alas! The demand for it has always been insignificant, and basketfuls every year, that could find no purchasers, were buried as manure.—*South of India Observer.*

SILK.

It is claimed by some manufacturers we know of, that our dyes—we cannot say very fast ones now-a-days—are unexcelled; that in the matter of plushes and velvets we stand alone. This may be so; certainly the qualities are gorgeous. And in the matter of economy, ask our friends in the North—say, by the Clyde side—what they fabricate from the "ends" that were formerly of such little use—whence they procure these nozles and chenille curtains. The gouty threads of Eastern raw silk have stimulated the ingenuity of our inventors, and now the automatic fingers stop the wandering of gouty silk so soon as a knob is encountered in the process. Very many of our readers will doubtless avail themselves of admission to the St. James's Square ball room, and will judge for themselves on all the matters above mentioned. English ladies, certainly excellent judges in most matters, will fail in this instance. Raw silk from the East is very largely used here—much of it from an uncultivated worm. There are many observers now roaming over the Indian Archipelago and other places, promising surprises, or new sources of supply of articles of known value; it is to be hoped that an observant botanist or two may be found amongst the comercial roamers who possess an eye to the evolution of silk and the food of the evolutionests. Our Antipodean colonists might find it to their interest to bestow more attention on the culture of the Mulberry tree and the breeding of the silkworm than they have done.

From a recently issued Consular report on the trade of Italy, we glean he following particulars respecting silk. In passing, it may be remarked that, although this document consists of only eighteen pages of letterpress, the compiler has in them stowed away a wonderful amount of statistical matter. He says:—In the year 1888–1889 over 50,000 quintals (1 q. = 100 lb.) of raw silk were exported from Italy, which, together with the amount of cocoons form 9-10ths of the product exported under the denomination of materials necessary for industries (about 320,000,000 fr., or £12,800,000 sterling). The silk imported is consequently in a very favourable condition, both in a raw and in a manufactured state, while the import is steadily decreasing.

As to the *£ s. d.* aspect of the subject, doubtless information could be obtained from the President of the Association, Thomas Wardle, Esq., F.C.S., F.G.S., Leek.—*Gardeners' Chronicle.*

MULCHING FRUIT TREES, ETC.

There is one matter of modern practice which gets insisted on in and out of season, by gardeners in print and in speech, and which runs the risk of getting overdone, and that is mulching as applied to the roots of trees in our orchards and kitchen gardens.

Mulching, as applied to trees newly planted, is right enough, and is a help to speedy rooting, equally applicable to the forest tree or garden shrub. Even in these cases the amount should be small, and not extend much beyond the root area, its sole object being the retention of moisture in the soil; for if the latter becomes evaporated by hot sun and parching wind, the interstices of the soil become filled with air, which draws the moisture, or in other words the sap, out of the roots in a harmful degree, and the exhaustion of moisture from the soil is only partially replaced in the warm season by capillary attraction from below, or by uncertain rains. Before mulching became so generally advised, we were taught to rely on a crumbly surface to retain moisture in the land, and for all subject not recently planted, I prefer it to mulching, as being better adapted to our moist climate and weak sunshine. For if mulching has its benefits, it also has the one great drawback of hindering the action of the sun in aerating and warming the earth. We look to the sun as the one source of heat wherewith plants are enabled to grow, and yet we do much by putting on masses of non-conducting material like wet straw and Fern, and even short grass, to hinder the access of sun-heat to the soil surrounding the roots of our trees. I will remember an instance of successful Peach, Apricot, and Fig growing in a garden 300 miles north of London, where the gardener—who, by the way, had never missed a crop in the thirty years he held the situation—never employed mulching to his wall trees after the first summer following replanting. The border was of moderate depth, of lightish loam resting on basalt rock, or the overlying strata of heavy loam inclining to clay. The soil of this south border was warm to the depth of one and a half feet, because there was no non-conducting medium spread on its surface; growth on the trees was moderate, and it ripened satisfactorily, forming plenty of blossom buds. The surface was pricked up twice during the summer, and hoed as often as became necessary to keep down weeds; and walking on it was by no means forbidden —and this was quite judicious, for nothing tends to good rooting, short growth, and fruitfulness like a firmly trodden soil. In wet weather only were the gardeners directed to keep to the row of rough plants, which stretched from end to end of the border.

Mulching, unless it be very light indeed, has a tendency to prolong growth in the autumn, and hinder its commencement in the spring, and is wanted only in the lightest of soils, at least so far as established trees are concerned. Rosarians will tell us that exhibition blooms cannot be got without mulching, and the season of bloom would be unduly shortened without it, and yet good Roses can be obtained without its aid. The Rose grower finds it an easy way of feeding his plants, as by employing strong farm dung for the purpose he is able to do that, and needs not to go round to his pets with a potful of stinking manure-water from the piggeries or the stable, but instead thereof waters his mulching with clean water. That is entirely a matter of convenience, and does not touch the real point of the case. He is satisfied if his Rose blooms beat those of his rivals, and, moreover, the Rose puts forth its shoots at an early part of the season, and become early matured even under this treatment; and the Rose grower does not look for a big crop, but only a few superlatively good flowers. Here, therefore, the man who mulches does but little harm, even from my point of view.

Where mulching is of the greatest use, and does scarcely any injury to the plants over which it is placed unless a great thickness is made use of, is on plants on the rockery, in the flower-beds, Strawberry beds, edible, and sweet Peas in beds or rows, Hyacinths, Tulips, Dahlias, Hollyhocks, Rhododendrons, &c., which in the main exist by means of roots near the surface of the soil. To encourage the growth of these roots by means of mulching containing little or no manurial elements, or still better in the case of the vegetables named, with one that may consist chiefly of dung and straw, is quite reasonable and legitimate practice.

Coco-nut fibre refuse is now greatly in favour as a mulching material, and for covering the soil beneath plants with small sparse foliage, as bulbs which flower in spring, beds formed of plants in pots for immediate and temporary effects, or where it is desired to hide the soil before the plants cover the same. The use of this kind of fibre rests chiefly on the nice contrasts of colour obtained, and the greater degree of finish and neatness its employment imparts to beds of plants; and as it contains nothing that is edible it is not disturbed by birds in search of food, nor do earth-worms throw their cast up through it. It contains no plant-food whatever, and may therefore never find employment as a feeding mulch.

To plants which are not expected to carry exhaustive crops of fruits, one of the best mulches is half-decayed leaves, or rather leaves left to decay about plants with many surface-roots. These should lay not more than 1 inch in thickness, and may be kept in place by a little soil being sprinkled over them. In beds of shrubs the wind will disturb the leaves at the outside, and these parts only will require to be kept in place in the manner above stated. It may seem odd to many to recommend pieces of stone, boulders, or pebbles as a mulching, and yet these things rank among the best retainers of moisture and also of warmth—points of great importance. Our ordinary mulches are not bad moisture-keepers, but they are the worst of heat-keepers; whereas

dark-coloured boulders are about as good as could be found. Roofing tiles, and less so roofing slates, are excellent means of drawing roots to the surface, when laid down pretty close together over the soil. This was recognised by our forefathers in growing the Strawberry, for they lined the rows of plants with the common red tiles, and obtained clean fruits, and plenty of roots near the top. Of course, the tiles were only down in the summer-time. It is a capital plan for growing early crops of these fruits on steep sloping banks facing south.

Most Ferns are benefited by growing amongst stones, if the soil employed be suitable, or by having stones placed around them; and as a rule the more stone and the less soil the better do the plants grow. In cases where boulders or sandstone cannot readily be obtained, and the Ferns grow on the level land, it will be found good practice to employ a mulch of leaf-mould, which should be only partially decayed. In all that has been above stated, there is nothing whatever that can claim to be new; but it is obviously of benefit to bring out of the horticultural arsenal some of the old appliances, for fear they should become rusty and forgotten.—A. Y. E.—*Gardeners' Chronicle.*

MYSORE COFFEE-PLANTERS' GRIEVANCES.

A "European in Mysore" writes as follows from Munzerabad to the *Weekly Scotsman*:—

SIR,—I have been deputed by a circle of Coffee planters in the Hassan District of Mysore to air our grievances in your paper, which has a large number of subscribers in India.

People say that farmers and such like are always grumbling, and the same charge is made against us; but our troubles do not spring from the weather or low prices or short crops, quite the reverse. Still our grievances are very real, and we hope some of your readers will advise us how we may better our condition.

I have no tale to tell of atrocities or tyranny, but to speak of the labour question, and to say that the disregard by the judges in this native State of our rights with reference to this question are very annoying to true born British subjects.

1. THE LABOUR QUESTION.—Formerly labour was in abundance. The supply exceeded the demand, but with the rise in prices new gardens have been opened, and the demand is increasing every day. Labourers either come as individuals and offer their services, or are brought in gangs by *maistrees* or contractors, who borrow from the planter and procure coolies of a certain caste to work off the planters' advance on the estate. The contractor has to advance the travelling expenses of his gang from their home to the estate, and every coolie is the contractor's debtor until the advances are cleared off. In one district, Shimoga, a tribe called Lambani or Brendiari used to work without a *maistree* over them; but from South Canara (in British territory) labourers of the Buntras caste were brought in gangs to North Mysore, and these two classes of labourers were mixed together. At first the contracts to provide labourers to work for the money advanced were faithfully fulfilled, but as the demand for labour increased the contractors began to enter into contracts with several planters at once and disappoint them all. To make matters worse, the Lambani tribe followed their example, to the serious inconvenience and loss of the planters.

If the labour market could be controlled by the European planters no difficulty would be left; but with the rise in prices the native ryots have taken to coffee cultivation in their garden patches, and the Holiyah labourers, whom they formerly employed for a mere pittance, are now able to earn good wages, and the ryots have adopted the system of making advances to the contractors; and, in short, competition has found its way into a labour market which in the good old time was ruled by custom. The native is demoralised by increasing prosperity, and if the law cannot interfore to enforce agreements, the system of contract must be abandoned.

2. Mysore is a native State. On 25th March 1881 the adopted son of a former Rajah was installed by the Governor of Madras, and the Government of the country was handed over by the Mysore Commission to the Brahman Diwan, or Prime Minister, the *ex-officio* head of every department. The Mysore Commission consisted of three British officers, the pick of the Bombay and Madras Staff Corps, and the State was splendidly governed in all departments. No finer roads were to be found in the world. The public bungalows were substantially built, and well conducted. Irrigation works were carried out on a large scale. In the Judicial Department the Courts were conducted by Judges who understood the native character, and could administer justice without suspicion of partiality for Europeans. The police were well-disciplined, and under the firm control of their superior. In short, the government was as good as British territory. But when the government came into native hands a change was felt by the Europeans in the country. The Judges are now recruited from a class of men who know nothing about the country, and will not go out of their way to inquire. It is useless for planters to appeal in questions about native labour to men of this stamp.

Our grievance has recently taken a very tangible form in connection with what are called the Labour Ordinances. Act XIII of 1859 has always been understood to have been passed expressly for the purpose of protecting employers of labour from fraudulent contractors, journeymen, artificers, &c. . . . With the return to native rule a new and serious cause of complaint has arisen. One of the Mysore judges has interpreted our agreement to be nothing more or less than a bond of slavery. . . .

Yet, in spite of all our grievances, coffee planting is a splendid life. It requires men of stamina and judgment to overcome the increasing difficulties of the coolie labour question. but if a satisfactory interpretation were put on Act XIII. of 1859, and if there were some appeal to a competent Court from the childish objection of the Hassan *munsef* with regard to an agreement which is made every day, our troubles might soon disappear.—*Madras Times.*

NEW ZEALAND FLAX OR HEMP.

To the Editor, "Norfolk News."

Sir—No subject is of more importance to the dwellers in the Eastern Counties than the question of agricultural depression, its causes, and the best mode in which these can be met and overcome. This is a vital question to all in Norfolk as, until prosperity can be restored to Norfolk agriculture, there will be no general prosperity of our county population, either town or rural.

The agriculture of Norfolk is largely dependent on plants introduced into the country for growth as agricultural crops during the present century. I mean the swede turnip, introduced about 1815; the beet root, about 50 years ago; and the kohl rabi and various cabbage plants, within the memory of the existing generation. Let any Norfolk farmer consider how he would now manage his farm without the aid of these plants.

I have for some time past kept a sharp look-out to see whether any other new plant could be introduced into England which would be likely to be equally beneficial to Norfolk agriculture; and I think there is one as to which there is a strong probability of its being capable of being beneficially introduced, not only into this county, but into other parts of England. It is the plant with the name of which I have headed this letter, which holds out, I think, fairer prospects of profit to the farmer than jam.

New Zealand flax or hemp is a plant which grows naturally in the New Zealand Islands and in Norfolk Island only. It has a range as a native plant of 1 degrees of latitude, from Norfolk Island to the southern end of the middle island of New Zealand, a district which may well be compared, in range of variety of climate, to the same range of latitude in

Europe lying between Edinburgh and the southern coast of the Island of Sicily. It therefore grows in an intertropical climate as well as extends into and throughout the New Zealand province of Otago, which has a winter of frost and snow very similar to our own in Norfolk.

A short time ago I entered into correspondence with Mr. Daniel Morris, the Assistant-Curator of the Royal Gardens at Kew, asking information as to this plant. I received most courteous replies, and every aid that could be afforded by him. During the last week in February I called at Kew, and was shown by him the plants growing in the open air in the gardens, as well as in the temperate greenhouses, and I was also shown the scutched fibre and manufactured products made from the plant, and was referred for further information to the work issued by the New Zealand Government, written by Sir James Hector, which can be purchased at the office of the Agent-General of New Zealand, at No. 13, Victoria Street, London, S. W., for 2s., and I refer all persons who may take an interest in this matter to that work.

At Kew, I found the plant a most magnificent one, with broad rush leaves, even at this period of the year, of a green as briliant as holly, but of a lighter hue. The leaves were on some plants at least eight feet long. The largest clump of plants at Kew was protected by tying the outer leaves together so as to shelter the inner ones, but about six other clumps of plants were wholly unprotected. I was informed that the oldest clump had been in the gardens for fifteen years, and had never been injuried by frost. The other plants had not been there quite so long; but, although left quite unprotected, had never been injured by frost.

I find from Sir James Hector's book, and the information given me by Mr. Morris, that there are nearly eighty varieties of this plant growing naturally in New Zealand, that each variety grows in a different situation, soil, and climate, some in swamps, some high on the mountains in the northern island, and in every variety of soil and situation. The plant has evidently the capability of readily adapting itself to every soil and climate within a wide range. It is considered to be descended from one parent variety only, and, therefore, will probably readily adapt itself to other soils and climates within a similar range on this side of the globe, as it has done at the Antipodes.

The plant, although the one main variety is most prevalent in swamps, by the side of running water, or where the swamp has had the stagnant waters drained off from it, also grows, as do other varieti s, on every soil, from the lightest sand to the heaviest clay. These plants vary in length of leaf according to the more or less fertility of the soil on which they grow and the variety of plant prevalent thereon.

The plant has from time immemorial had its fibres extracted from the leaves by the native Maories, and been used for weaving into various kinds of cloths and for very various purposes; but the process of extracting the fibre was a very slow one, and the article could only be produced in small quantities and at a high cost.

From the time of the early settlement of the colony down to recent times, machines have been invented for preparing this fibre for the various purposes for which it is available. Within recent years several effective machines have been constructed, and are now in operation in New Zealand. By this means fibre of several different qualities have been produced, and mainly exported to England. The lowest quality of fibre for rope-making is saleable in England for about £20 per ton, and of this about three-fourths of a ton can be produced from an acre of the flax plants, with about an equal weight of tow suitable and saleable for paper-making. But by a more careful process and selection of the best leaves, fibre of a silky, lustrous kind can be extracted which is of the value of from £50 to £70 per ton, and the very best silky, lustrous fibre made by the natives by hand is worth from £70 to £100 per ton.

It is not positively known for what purposes this fibre is used, but is believed to be used in England in the manufacture of silks and poplins. I think I have stated sufficient facts to show that if the fibre can be produced in New Zealand, where unskilled labour is paid at the rate of 8s. per day of eight hours, bear the cost of freight to England, and then is sold in England for use in manufactures either of rope, paper, or woven fabrics so as to yield a profit to its producers in New Zealand, it can be produced so as to yield a larger profit in England, where the market for it exists, if the plant can endure the English climate.

That seems to be the only difficulty which will have to be surmounted, and that can only be decided after experiments in the possibility of growing it here have been made.

In Sir James Hector's book it is mentioned that experimentally, one plot was planted in the Domain Garden, at Christchurch, alongside of other plots, the plant having been obtained from the warmer climate of the northern island; and, while adjacent plots bore the cold climate uninjured, this one plot was totally destroyed by frost, evidently succumbing to the colder climate to which it had been introduced without having become first acclimatised. In making experiments it will, therefore, be requisite to obtain the seeds or plants either from the parts of the southern island which have a cold winter like our own, or from the mountain sides, which lie at such a height above the level of the sea as to have about the same climate as that existing at the southern end of the middle island of New Zealand, and the seeds and plants should be of the varieties which in New Zealand have proved capable of sustaining the colder winter climates existing thereon.

Although very little artificial cultivation has existed in New Zealand, what has taken place has been by planting off-sets or side-shoots taken off old plants in the same way as the sugar growers plant their sugar-cane plantations.

It will be requisite, probably, to commence in England with plants raised from seed, because no stock of plants exist in England; and this will at first be a difficulty, because it is said that when grown from seed taken from a specific variety of plants the produce does not come true to that variety. It is said that the plant has been introduced for some years into the southern island, but I have no information as to its growth there.

When artificially grown in New Zealand, the plants have been planted at distances of six feet between the rows, with an interval of six feet between the plants in the rows, requiring about 1000 plants to the acre; but in some cases they are planted with intervals of three and four feet respectively, requiring a correspondingly larger number. To produce from seed it will be requisite that the plants shall be from three to four years old before they arrive at maturity. To solve the question of the power of acclimatisation in England, it will only be requisite to have small plantations of seedlings in corners of fields, and if they will endure the climate for the first two years, then to transplant them into regular plantations, the early nursery plantations being more closely grown than the later one, and therefore occupying comparatively very small space.

If the plant can be grown in England, it will be very suitable to be grown on lands held by the land owner in hand, like the plantations where underwood and hop poles are grown, and, like those plantations, the flax will make game coverts of the best description.

The plantation, when established, will require no annual labour expenditure, except to keep the ground free from weeds, to cut the leaves, and scutch out the fibre.

All that can be realised above this cost will be of the nature of annual rent, realised out of the plantation by the landowner.

It will probably be more suitable for growth on the fen lands than for any other, but there are varieties in New Zealand which grow on every description of soil although not so productive.

Having launched this question before the county, I think I may fairly leave it for the future in the hands of the landowners and tenants who are chiefly interested, merely suggesting that it is a case to be

taken up by both our county agricultural societie and the Royal Agricultural Society.—I am, sir, you obedient servant, W. G. Winearls.
Swaffham, Norfolk, 4th March, 1890.

THE MICROSCOPIC STRUCTURE OF PLANTS, AND ITS RELATION TO CULTIVATION.

A very interesting discussion took place at the Paris Botanical Congress last August, and a report of which is now before us, on the employment of microscopical characters as an adjunct to classification. M. Vesque, who introduced the subject, was, we believe, perfectly right in insisting that the comparative study of the microscopical characters presented by plants should receive a due proportion of attention as other characters do. It does not follow that they are better or worse than others. We do not know at present what their precise value may be, whether they are as subject to variation as others; but their importance cannot be denied, and to allege that they are difficult and troublesome to investigate, though it may be true, is no argument against their intrinsic value, In so far as they are hereditary, and, therefore, relatively constant, they are known already to be valuable aids in discriminating the larger groups of plants, and what M. Vesque and some other naturalists are anxious to do, is to extend the use of these characteristics to each natural family of plants, so far as circumstances permit. Any arrangement founded on these characters alone, would, of course, be just as unsatisfactory as any other artificial or incomplete system would be. We do not suppose that M. Vesque has any intention of founding a system entirely on these characteristics. For classificatory purposes the congenital characters, more or less fixed by long hereditary transmission, are naturally preferable to those characters which are called "adaptive," because they vary according to circumstances. These are the characteristics, the possession of which enables a plant to sustain itself under new or adverse conditions; these are the endowments in the absence of which the plant cannot survive in the battle of life. Whether then, from the point of view of classification, of relative constancy, or from that of adaptation to varying conditions, the anatomical characters appear to be of the highest importance, and this is so obvious that it seems strange that any contrary opinion can be maintained. Such an opinion can only be entertained under a misapprehension.

But in these pages we are more directly concerned in the relation these characteristics bear to the cultural art. It is certain that many structural details are directly associated with variations in the conditions of life. The structure of a plant that passes its life in water is widely different from that of its near relative that grows on dry land. So intimate is the relation between the structure of a plant and the circumstances under which a plant grows naturally, that it is very often possible to recognise in a previously unknown plant the kind of life it must have been subjected to. Of course from our ignorance and limited knowledge, there are many exceptions and much that seems anomalous. But these facts form no valid argument for not availing ourselves as far as we can of what we do know, still less does it constitute a reason for not pushing our researches further in this direction. M. Max Cornu, in discussing M. Vesque's paper, seems to have objected to it as proposing a new system—a substitute for the natural system—but a perusal of M. Vesque's writings leads to no such conclusion. All that M. Vesque wishes to do, so far as we can make out, is to enlist anatomy in the work of perfectionating the so-called natural system.

M. Cornu, too, also raises objections to the employment of anatomical characters as a guide to cultivators. M. Vesque said that the anatomical structure [sometimes] clearly indicates the natural of the physical conditions to which the plant is adapted, and which must be realised as much as possible under cultivation. To this M. Max Cornu objects, and says that we cannot in general realise what conditions would be necessary in the case of plants removed from their natural surroundings and placed under other circumstances, to which they must adapt themselves or perish. Many of them live and prosper under the new conditions—conditions which are quite different from the natural ones. What information, asks M. Cornu, could the study of structure give us, since different conditions give results superior to the normal ones? Coffee, says he, requires a rich (*forte*) soil in the tropics; it would perish here if grown in such a soil. The Nepenthes cannot, he says, be grown here except in an extremely porous substratum, while in Sumatra the soil in which the Nepenthes grows is a heavy impermeable loam.

In replying to M. Cornu's observations, M. Vesque admitted his inability to reply to the two special cases —that of the Coffee and that of the Nepenthes, but stated that he was chiefly concerned with the relations of the structure to light and moisture, and doubted whether M. Cornu would succeed in making a plant adapted to grow in the shade flourish in full sun, and *vice versâ*; nor a plant adapted to a dry climate thrive in a moist one. In support of his argument, M. Vesque called attention to the construction of plant-houses divided into separate compartments. allowing of variations of temperature and moisture, Anatomy often indicates what the treatment ought to be, or, inversely, in which compartmen t(*cal*) we ought to place a plant.

Great difficulties stand in the way, no doubt; the application of a knowledge of anatomical structure to cultural purposes is in its merest infancy, but that it is destined in future to play an important part in practical horticulture, seems to us as absolutely certain as that a knowledge of the letters of the alphabet will, under given conditions, enable a gardener to read the *Gardeners' Chronicle!* It is not to be expected that practical gardeners can as a rule become expert microscopists, but they can profit by the skill of others, and it is the duty of those who have the power and the means at their disposal to hasten and foster the progress to the utmost of their ability.—*Gardeners' Chronicle.*

INDIARUBBER.

In these days, when local horticultural societies are formed in almost every provincial town, and when botanical and horticultural novelties attract so much attention from scientists on the one hand and cultivators on the other, the practical value of the combined efforts of both seem likely to be lost sight of. The interest attached to the successful growth, or to the flowering of a rare plant like the Amorphophallus at Kew last year, is equally divided between the scientific botanist and the practical horticulturist, but the introduction and successful cultivation of some valuable economic plant in countries very far distant from its native home, does not secure half so much popular attention, though the benefits accruing from it to the world at large are infinitely greater and of a more lasting character. What is the production of a double flower where a single one was known before only to exist, or even the introduction to our stoves of such plants as the Victoria regia and the Amorphophallus titanum, or, if possible, the Rafflesia, and Welwitchia, to the etablishment in India of the Cinchona plants which has been the means of bringing that most important medicine, quinine, within the reach of all.

The result of this successful enterprise will always stand as a monument of the union of science with practice, and one of the benefits to the world in which Kew has played so large a part.

Next to this achievement, the introduction of rubber-producing plants into the various possessions of the British Empire is undoubtedly of the greatest importance. Though the whole history of these experiments has been given in the Reports of the Royal Gardens Kew, ranging between the years 1873 and 1882, it may be of some interest to point out that whereas some

twenty years ago indiarubber, or caoutchouc, was known to be produced only from Hevea braziliensis, then known as Siphonia elastica, from Para, and from Ficus elastica, from Assam, the researches of the authorities at Kew have since shown that the rubber of commerce is drawn from several different plants, belonging to the natural orders Euphorbiaceæ, Urticaceæ, and Apocyneæ. The first-named family, including the Para sort, or Hevea rubber, which is still imported in large quantities, and holds its own as the best quality, though in its native forests the trees are said to be more and more difficult to get at, as the collectors have to penetrate further each year into the more inaccessible parts. The natural consequence of this is, that more attention has been given to other sources, and another Euphorbiaceous plant, the growth of which has become considerably developed of late, and which yields the rubber known in commerce as Ceara scrap (Manihot Glaziovii), has been introduced into Ceylon and other countries, where it has grown rapidly. This, as its name implies, is a Brazilian species, and though the rubber has been known in trade for a long time, the plant yielding it was not known till about fourteen years ago, when a consignment of plants was received at Kew, propagated, and widely distributed to India and Ceylon. The success of the plants in these countries has been recorded and fully detailed in the Kew reports before referred to; as also that of another well-known source, namely, the Castilloa elastica, which furnishes the bulk of the rubber from Central America, such as that known in trade as Guatemalo rubber.

Mr. Morris, in his little book on *The Colony of British Honduras*, gives some interesting notes on this tree, and details as to the cultivation and the extraction and preparation of rubber from it. He says:—"The tree is very abundant in some places, although daily becoming scarcer in the immediate neighbourhood of settlements. It grows to the height of about 40 or 50 feet, has a thick clean stem about 2 feet in diameter at the base, and in habit of growth much resembles a Bread-fruit Tree, to which, indeed, it is closely allied. . . . The Castilloa Rubber-tree is fit to be tapped for caoutchouc, or the elastic gummy substance produced by its milk, when about seven to ten years old. The milk is obtained at present from trees growing wild by men called rubber gatherers, who are well acquainted with all the localities inhabited by the Toonu (under which name the plant is known in Honduras). The proper season for tapping the trees is after the autumn rains, which occur some months after the trees have ripened their fruit, and before they put forth buds for the next season. The flow of milk is most copious during the months of October, November, December, and January. The rubber gatherers commence operations on an untapped tree by reaching with a ladder or by means of lianes, or tic-tics, the upper portions of its trunk, and scoring the bark the whole length with deep cuts which extend all round. The cuts are sometimes made so as to form a series of spirals all round the tree; at other times they are shaped simply like the letter V, with a small piece of hoop-iron, the blade of a cutlass, or the leaf of a Palm placed in the lower angle to form a spout to lead the milk into a receptacle below. A number of trees are treated in this manner, and left to bleed for several hours. At the close of the day the rubber gatherer collects all the milk, washes it by means of water, and leaves it standing till the next morning. He now procures a quantity of the stem of the moon plant (Calonyctyon speciosum), pounds it into a mass, and throws it into a bucket of water. After this decoction has been strained, it is added to the rubber milk in the proportion of one pint to a gallon, or until after brisk stirring, the whole of the milk is coagulated. The masses of rubber floating on the surface are now strained from the liquid, kneaded into cakes, and placed under heavy weights, so get rid of all watery particles. When perfectly drained and dry, the rubber cakes are fit for the market, and exported generally in casks."

"A large tree of Castilloa, say 2 feet in diameter, will yield 8 gallons of milk when first cut; each gallon of milk, in the proper season, will make about 2 lb. of rubber. Hence, a tree of this size will give a return of 16 lb. of rubber, of the value of 10 dols."

Mr. Morris further refers to the use of the Castilloa as a shade-giving tree in connection with the cultivation of Bananas, Cacao, Liberian Coffee, Oranges, &c., and records the fact that at the time he wrote in 1883, the Cacao planters in Trinidad were gradually discarding their recognised shade-tree, the Erythrina umbrosa, and adopting others more suitable and more profitable, none of which, however, could compare with the Castilloa, "either in quickness of growth, in shade giving properties, or in the return which it is likely to give the planter year after year, if properly treated." Our engraving on p. 649, taken from a photograph kindly sent us by Mr. Hart, represents a Castilloa tree growing in Trinidad.

It will be sufficient to say that the plants already referred to are the principal sources of the American rubbers of commerce. Quantities, however, come from India, and from other parts of the East, the former from Ficus elastica, and the latter from various plants belonging to the Apocynaeæ, being species of Willoughbeia, Leuconotis, and Chilocarpus; while on the East and West Coasts of Africa, severals species of Landolphia yield rubber of excellent quality. A detailed account of these species, and of their distribution into various parts of the world, is given in the Kew Reports before alluded to, and it forms one of the most valuable and interesting records of work done at Kew.—J. R. J.—*Gardeners' Chronicle.*

CEYLON PLANTING ENTERPRISE.—An experienced planter who writes congratulating us on the completion of another Edition of the "Handbook and Directory," deals with the Planting Statistics as follows:—"220,000 acres of tea at 250 lb. are sure to give us 60,000,000 lb. of tea. Coffee,—Well, the less said about it the better. A crop of 3 cwt. one year and 1 the next, just about pays its way at present prices and that is only what you get off the best estates. Coffee is a *delusion* and a *snare.* Cinchona is ditto ditto unless it rises to 2½d a unit." But what about Cacao and Cardamoms, and Rubber if the talked-of "boom" in the home markets comes on?

TOBACCO.—With all the able remarks made by Mr. J. Berry White at the meeting of the British Deli and Langkat Tobacco Company on the disastrous attempts to grow tobacco similar to that produced in Sumatra we fully agree. Borneo is the only other place that can cultivate it successfully but, in common fairness to that country, we would point out that the statement "if it fetched $1 per lb. it would not cover expenditure," is scarcely accurate. It is almost too soon to say what Borneo will eventually do in the way of growing tobacco, for the country is now going through the difficulties of labour, sickness, &c., which the earlier planters in Sumatra know so well. But one company which has been established for three years, and whose 1888 crop was sold at an average of 1s 10d per lb. (covering a large proportion of broken leaf), earned and paid a dividend. Without laying down any hard-and-fast line, it seems that Borneo will be able to produce tobacco which, if sold at a guilder a pound, will yield a fair profit. In any comparison between the cost of producing tobacco in the two countries it must be rememberd that there is no poll-tax on Chinese entering Borneo, and that food supplies in most of the districts are much cheaper than in Deli. We hear a rumour—though we have no confirmation of it—that an offer of 4s per lb. has been made for the 1889 tobacco crop of the Darvel Bay (Borneo) Tobacco Co., the estate which was launched by Baron von Stein.—*L. and C. Express*

Correspondence.

To the Editor.

CEYLON TEA IN AMERICA: MR. STANTON'S VISIT.

Brunswick Hotel, New York, U.S.A., April 29th.

DEAR SIR,—I last wrote you from America on the 29th ult., and I have since that date visited many towns both in the United States and in Canada and wherever I have been, I am glad to say, I have been shown samples of Ceylon Tea. This tea is becoming known everywhere in both countries and is pushing its way—it may be slowly but I think there is no doubt that it is *surely*. The trade appears to have taken root, and now it is beginning to grow, and appearances point to a steadily increasing trade, and one which seems likely to be capable of great expansion. I think a very good work might be done by the Ceylon Planters' American Tea Company did their means permit of their distributing their energies in various towns. *Here* I think they will be a most useful factor, but I feel that still greater benefit would result to the industry if branches could be opened in other cities of the United States, or in some large town in Canada, such as Montreal or Toronto. It is so much easier to reach the actual *consumer* through an agency of this kind than in other ways and, naturally when once a demand is created and the consumer is caused to *enquire* for Ceylon tea—the trade will not be slow in responding, by purchasing themselves in order to supply this demand.

It will be perhaps specially interesting to Ceylon tea planters to hear that I have seen all kinds of Ceylon tea in my travels—not only all grades—pekoes, pekoe souchongs, and broken pekoes—in some cases also fine orange pekoes—but teas grown at all elevations—some possessing strength more especially, and others being bought entirely on account of their flavour.

Hence Ceylon tea planters may take comfort and encouragement from the present condition of the trade here, and I think they may look forward with confidence to a marked development in the trade. Although much of the tea now seems to be used for mixing, I am happy to say I have come across one or two places where it was being sold in its pure state—unblended with any other kind--and this not by persons interested in tea plantations—but simply and solely on account of the intrinsic merits of Ceylon tea which they had recognized to their personal advantage, because the result was a considerable demand for their teas!—I am, dear sir, yours faithfully, A. G. STANTON.

CEYLON TEA IN CANADA: MR. STANTON'S VISIT TO AMERICA.

Halifax, N. S., May 8th.

DEAR SIR,—The last letter which I wrote you was from New York on the 29th April; and since that date I have visited Boston, S. John, N. B., and Halifax, N. S. In Boston there is some demand for Ceylon tea, and its use appears to be on the increase. This town is an important tea market, and I find both Ceylon and Indian teas have a considerable sale there.

St. John, N. B., and Halifax, N. S., although both considerable tea markets use very little besides China tea. One of the largest tea firms here told me there was absolutely no sale for Ceylon tea, but on going round to a number of retailers I found that a demand was commencing and that already business in Indian tea is being done to some extent—besides on a limited scale in Ceylon teas. I should think New Brunswick and Nova Scotia would soon become large consumers of Ceylon and Indian tea, because they take so much China congou that the same conditions which led to the increased use of Indian and Ceylon teas at home should apply with equal force here. I believe, on that account, it would be worth while for Ceylon planters to make a special effort to get their teas worked in these provinces—either through the Ceylon Planters' American Tea Co. or in some other manner.

In the United States where so much Japan and Oolong tea is used it is not surprising that Ceylon tea has made slow progress—but here it ought to make very rapid advances if only there were anyone to draw people's attention to it; the present also appears a specially favourable time for its introduction, as large quantities of very inferior China teas have recently been brought over here—and seem to have somewhat disgusted people. I believe it may be from this cause that just now more attention is being drawn here to British-grown teas amongst the retailers.

My tour in Canada and America has now almost concluded—I have visited all the towns which I came out to see; amongst other places Philadelphia, Baltimore, Chicago, Montreal, Ottawa, Toronto and Hamilton—besides those already alluded to in this letter. Wherever I have been I have seen a great deal that leads me to believe that the Ceylon tea trade here is but in its infancy and that it is certain to grow and to grow surely even if somewhat slowly. I have been surprised to see how much Ceylon tea is already used in Canada and the States—to a much greater extent than is generally supposed.

The prospects of Ceylon tea on this side of the Atlantic are therefore decidedly encouraging—and with efforts to force the trade—on the part of Ceylon planters—there should soon be an extensive and increasing market for their produce.—I am, dear sir, yours faithfully, A. G. STANTON,
(of Gow, Wilson & Stanton).

COFFEE BLOSSOM—AND ETCETRAS—ABUNDANT.

DEAR SIR,—Any connection between mangoes, roses, fleas and mosquitoes! All are very prolific this year. A very fair *coffee blossom* and in and about Kandy—lucky owners! The fragrant berry will be up to R15 a bushel before the end of the year, or my name is not what it is.
OLD COLONIST.

THE MANUFACTURE OF "GREEN TEA" IN PEERMAAD, TRAVANCORE.

May 26th.

DEAR SIR,—An article has lately appeared in our Indian papers copied from a Ceylon paper, greatly extolling the district of Peermaad, Travancore, as to soil, cheap labour, etc., with regard to tea culture, the result of an interview with one of the tea planters of the district; but when on the subject of "green tea" and the samples sent from "Bon Ami estate" the *name* of the gentleman to whom all the success and "kudos" of the green tea manufactured is due was some how forgotten to be mentioned in that interview

(anyway the name is not mentioned in the article). So surely it is only fair that it should be stated that "the green tea so favorably reported" on by Mr. F. F. Street was solely and entirely manufactured by Mr. Robert S. Imray (the son of an old wellknown planter in Ceylon), superintendent Bon Ami estate, the property of the late Mr. James Darragh of Aleppey. The writer of the article on "Tea Cultivation in Travancore" seems to be under the impression that all the credit of the green tea is due to Mr. F. N. Parker, whereas the samples were given to him by Mr. Imray to take to Ceylon, with the request that they should be shewn to some man of experience in tea matters. I may add green tea manufacture here in this district was never, I believe, even thought possible, till Mr. Imray started the idea; and that he has been most kind in shewing his brother planters, *free of expense*, this new process in making green tea, is surely the more reason that justice should be done him! TRAVANCORE.

THE NEW ZEALAND AND SOUTH SEAS EXHIBITION:

LETTER FROM MR. WATSON.

Kandy, May 30th.

SIR,—I beg to enclose copy of letter received from Mr. W. Watson regarding the New Zealand and South Seas Exhibition.—I am, sir, yours faithfully,

A. PHILIP, Secretary.

Dunedin, April 30th.

A. Philip, Esq., Secretary, Planters' Association, Kandy.

Dear Sir,—I wrote to you last on 13th March (press copy enclosed) and have since received your letter of 4th March. The Exhibition was closed on the 9th instant and was a success until the last. The following were gross receipts at the Ceylon Kiosk since my last account:—

Gross takings from 26th Nov. to 24th Feb. inclusive £265 13s 9d; 25th Feb., £3 9s 6d; 26th Feb., £3 18s 6d; 27th Feb., £3 8s; 28th Feb., £4; 1st March, £4 8s 3d; 3rd March, £2 7s 6d; 4th March, £3 13s; 5th March, £3 18s; 6th March, £8 15s 6d; 7th March, £3 2s; 8th March, £4 16s 7d; 10th March, £3 15s 2d; 11th March, £2; 12th March, £4 9s; 13th March, £3 15s; 14th March, £3 14s; 15th March, £6 1s; 17th March, £2 18s; carried forward £33 2s 9s, 18th Murch, £2; 19th March, £3·16s; 20th March, £5 7s 21st March, £2 11s; 22nd March, £4 1s 6d; 24th March, £5 2s 6d; 25th March, £2 4s; 26th March, £2 10s; 27th March, £1 15s 6d; 28th March, £2 5s 6d; 29th March, £3 10s 9d; 31st March, £3 12s 6d, 1st April, £2 0s 6d; 2nd April £2 9s 9d; 3rd April, £2 17s; 4th April, £6 2s; 5th April, £6 11s; 7th April, £8 18s 9d; 8th April, £3 17s 3d; 9th April, £4 2s 6d; 10th April, £3 16s; 11th April, £4 3s; 12th April, £5 9s 6d; 14th April, £5 11s; 15th April, £4 4s; 16th April, £4 14s; 17th April, £4 16s; 18th April, £4 11s; 19th April, £11 2s 9d; closing days £4 5s 2d. Total £466 19s 2d.

THE KIOSK.—Messrs. Drummond Bros. of Adelaide have declined to purchase the Kiosk at my figure. I telegraphed to them to make an offer, but had no reply. A Mr. Gilchrist of Christchurch is at present corresponding with a view to purchase, and the price of £50 has been named to him, for the bare Kiosk, as the lowest which can be accepted. Mr. Joubert informs me that he has secured the management of an Exhibition to be held at Launceston in December next, and he offers to arrange for efficient representation of the Planters' Association, there for the salary of £3 per week to be paid to the person appointed by him. He suggests that one of the Sinhalese natives (Jayanhamy) would be sufficient, the rest of the service to be by girls engaged on the spot at about 15s per week. He desires me to ask you to wire *as soon as possible* if you desire to be represented as above, and if you will therefore wire to the address "Napoleon Dunedin" the word "agreed," I shall inform Mr. Joubert of it wherever he may be at the time. If Mr. Gilchrist does not take the Kiosk and you decide on exhibiting at Launceston, the Kiosk of course will go there, and I shall expect the Dunedin Exhibition to be credited £50 for it. In the meantime it is being taken to pieces and will be packed and stored here.

ACCOUNTS.—These cannot be closed up for a short time yet, as there are several items to collect, but at a rough computation, I should say (counting the Kiosk at £50) there will be enough money at this end to pay all bills and servants' wages and also passage fares of the natives to Ceylon. Pending sale of the Kiosk I may however have to ask Mr. H. McKenzie of Melbourne to draw upon you for the native passages from Melbourne to Colombo. Detailed copies of accounts will be sent to you as soon as possible.

NATIVE SINHALESE.—These men wished to receive their wages here, and I have accordingly paid them as per agreements with Mr. Carlyon. Please find herewith the agreements with full payments receipted thereon.

AWARDS CERTIFICATES.—I send in charge of Jayanhamy addressed to you a tin box containing certificates as per accompanying list. Jayanhamy has been instructed to leave the box with Mr. Carlyon.

KANDYAN ARTWORK.—I regret to say that these articles have not met with the public appreciation here which they no doubt deserve, and I am of opinion that they will not fetch in this market one half the prices placed against them in the list received by me. Two small articles have been sold, and pending your instructions I have had the rest stored here.

SALE OF OTHER EXHIBITS.—The tea exhibits have been sold to the Ceylon and Indian Tea Association at an average of 1s 4d per pound in bond, and the balance of the tea sent for use at 1s per pound. The coffee samples I purchased myself at 1s per pound. These prices are higher than could be got by selling to others.

Photographs, mats, etc., are being sold by Mr. Begg. —I remain &c., (Signed) W. WATSON, Inspector, Colonial Bank of N. Z.

P. S.—Just as mail is closing I find the awards will not be signed in time to send. I shall forward them as soon as possible.—(Initialed) W. W.

TEADEALERS AND BONDED WHARFINGERS.

TO THE EDITOR, LONDON "GROCER,"

Sir,—One effect of the late "rush" to clear teas has been to show up in its worst light the manner in which the London wharfingers and bonded warehouse keepers (who have mostly made considerable fortunes out of the trade) conduct their business, for their customers the wholesale dealers, when any extra pressure arises to clear out packages quickly. I do not hesitate to say that the difficulties and delays in obtaining delivery of our own teas have been a scandal, and the confusion and block at most of the docks all this month in spite of weeks of previous warning, reflect discredit upon the warehouse keepers.

How long are the wholesale trade going to tamely submit to a state of things so injurious to their business, and to the annoyances caused by the bad management of these gentry who make their profits out of us?

Numerous cases have occurred of teas with duty paid early and in advance on the last days of April, so as to be ready for the new rate on May 1st, not being delivered until a week or ten days after, with expense of carts or vans applying daily in vain; and when clerks and clearers are sent down again and again to find out the cause, the cooly told the carmen have never applied, or that warrants have been mislaid, or that the packages are lost; or, again, perhaps some important clearing is stopped for a few pence dock-rent because, by their own default, the packages have been detained so as to run into a fresh week!

But this is not the worst, for a system of blackmailing has grown up amongst the foremen and dock workers which ought certainly to be stopped. These "dockers," who, a few weeks ago, were striking for more pay, now are not satisfied by being paid for their work, but also, in cases of urgency being required, are not ashamed to demand "beer-money," or to have their palms greased by those requiring delivery or sampling, before they will trouble to exert themselves to do the work for which they are employed. Country dealers often wonder, and write and complain of delays, but they little know the trouble it often is, even after duties, &c., are all clear, to get delivery in reasonable time.

Then, again, there is the old and absurd practice of having a general midday dinner-hour, when all dock work, however urgent, must be suspended at the busiest time of the day! and this, too, when Custom House work must be done before half-past three o'clock! Fancy going into a bank, or some big store, to do business at midday, and being told you must wait for an hour, or call again after dinner! Yet this is what our trade have put up with for long years past.

What is the remedy? 1. To make the wharfingers understand they must pay better attention to the wants and requirements of the wholesale dealers, and not merely to the importers. 2. That the evils of a partial monopoly should be kept in check by some independent competition; and the best and most practical way of doing this would be by dealers establishing a wharf and bonded warehouse of their own, and managed in their interests, instead of in that of importers and proprietors.

We know, of course, that the members of the Tea Clearing-House have agreed for a time not to encourage any fresh bonded warehouses being established, but this rather short-sighted policy is one easily terminated by due notice for the benefit of the trade. A powerful and wealthy body like that of the wholesale tea trade could easily start a company for a "tea trade wharf," and bring immediate business to support it, and thus many of the vexations and delays at present experienced would soon be remedied, and the undertaking produce a fair profit into the bargain.

Will our Wholesale Tea Trade Committee take the matter into consideration and see what can be done? They will find themselves well supported.—I am, &c.,

AN INCONVENIENCED DEALER.

London, May 21st.

COFFEE IN DIMBULA.—"The Patriarch" writes:—"What a glorious season; never in my period can I, so far as I can recollect, remember such a season. Now nearly six months' sunshine with ample moisture at periods when required! Tea flushing splendidly and wherever coffee is good it never looked more healthy than at this time, but I fear the next four months will show us our old enemy is still to the front when weather favours his developement."

KALUTARA TEA AND PADDY DISTRICT, May 29th. —We had an awful night of lightning and thunder and rain which give us 5·26: lucky it was not strong wind. It has done a lot of damage to roads and drains. We had on Sunday last service at Culloden. The Rev. Mr. Bestall came down: I am sorry the weather prevented many from coming. Since then Mr. Bestall has paid us all a visit. I am afraid he has had a very rough journey. I need not say I am sure he received a hearty welcome from all. Influenza still bad and am sorry to say labour is scarce, and regret more to hear that they are wanting more pay. I hope that no one will have to raise their wages, for the present price of tea won't allow it. I have never seen the paddy look so well, and should they get a good harvest, which I trust they will, no one will complain of paying the paddy tax: it is the very bad years of late that have been so much against them.

TEA PROSPECTS IN ASSAM.—May has again been a most disappointing month. The first few days were extremely hot with a tremendous sun, and the clerk of the weather has behaved to us very shabbily in the way of rainfall. Last year he swamped us with something over 30 inches to date, and this year he has left us thirsty and longing with something just over 12 inches, and without a single really heavy shower to record; the result being that all gardens in this district are very much behind their estimates and outturn to a similar date last year. Unless we are more favoured in June things will have assumed a really serious aspect, as the drought has now gone well on into the season.—*Englishman.*

CINCHONA CULTIVATION IN JAVA.—The report of the Director of the Java Government Cinchona Enterprise for the first quarter of 1890 is a somewhat gloomy one; for he speaks of much damage done to the plantations by wind-storms and still more by caterpillars, which are becoming a serious scourge. The only remedy seems to be close planting, and this is being carried out everywhere. The weather being favourable during the quarter, planting operations were carried out vigorously, there being a sufficiency of young plants available for the purpose. The crop of 1889 was all despatched to Tandjong Priok by the beginning of March, and amounted to 703 503 half kilograms of bark, of which 2,339 half kilos were reserved for the local military medical service. At the sales of 1889 bark at Amsterdam in January, February and March the prices averaged 9¼, 10 and 9 cents.

THE INDIAN LIKE THE CHINA, TEA SEASON and Statistics close at end of April, and a great pity we now think it is, that the Ceylon Commercial Season when altered was not made to run in correspondence; for there will be this element of confusion with our Commercial statistics for the Calendar years, that they will never agree with the Customs returns to which so many authorities in the Commercial as well as Statistical world are apt to pay special attention. It will be very awkward to have two sets of figures, differing considerably, representing the Staple Exports of Ceylon for a series of calendar years. It may not be too late for the Chamber of Commerce to consider whether they should not make their Commercial Export Season run from 1st May to 30th April, so that the Tea Statistics may be available for precisely the same periods as those of India and China and the confusion of varying returns for the calendar years avoided. A May to April season is what was asked for by the London Brokers.

BLACK WALNUT.—One of the largest specimens of Black Walnut probably ever sent to an eastern market in the log may now be seen in the timber yard of Messrs Johnson Bros., 385 Albany Street, Boston. The tree which produced it grew near the falls of the Kenawah, in West Virginia, on the line of the Chinapeake and Ohio Railroad. The trunk, which measured sixty-four feet to the first branches, has been cut into five lengths; the butt log, the centre of which is hollow from decay, measures at the base eight feet and a half across. The diameter of the log, cut twenty-five feet from the ground, is four feet two inches, and that fifty feet from the ground has a diameter of three feet eleven inches in one direction and three feet in the other. The upper end of the fifth log, at a point sixty-one feet from the ground, where the trunk had been a good deal flattened, measures four feet one inch through one diameter, and two feet nine inches through the other. These measurements are all made inside the bark. A thousand feet of lumber have been cut from the main branches and the five trunk logs are estimated to contain 10,000 feet. The wood in the butt log outside the central cavity is beautifully curled and marked. A superficial examination of the annual layers of growth shows that this great tree has grown on the whole with wonderful rapidity and that it is probably less than 300 years old.—*Garden and Forest.*

REMARKS ON THE STATE OF BOTANY IN CEYLON,

WITH REFERENCE TO THE KNOWLEDGE OF IT IN APRIL 1843, AND AN ATTEMPT AT ARRANGING ITS FLORA AS KNOWN TO MOON AND RESIDENT BOTANISTS ACCORDING TO LOCALITY AND ELEVATION, COMMONLY CALLED GEOGRAPHICAL DISTRIBUTION OF A FLORA.

By CAPTAIN CHAMPION, 95TH REGT.

(*Continued from page 46.*)

I have not however sat down to persuade; in all countries Horticulture and Botany are charms to but a portion of the community, but to a sufficient number to become subjects of public attention, and even to attract the notice of Government, this is the age for Botany as well as other pursuits. Kew re-established—and in the hands of the most accomplished Botanist of the day—the princely greenhouses of Dropmore, Chatsworth, Woburn Abbey, and many noble residences; whilst foreign countries are ransacked by collectors for private Greenhouses or public societies. We find the late Duke of Bedford importing from Mexico a waggon load of Cactuses, one of which an Echino-cactus weighed upwards of two cwts, and had to be carried for some distance on the shoulders of eight Indians. Another (a cactus-senilis) which some of us may have seen in England, was fourteen feet high. In Ceylon we know that the Duke of Northumberland has not been idle, he may possibly be better acquainted with its botany than our present residents. The *great Duke* himself, can boast of the best avenue of Beech trees in the kingdom at Strathfieldsaye, (better even than Sir Walter's.) It is related of him that when Loudon was engaged in the publication of his Arboretum "he wrote for permission to take drawings from some of the trees of Strathfieldsaye, the Duke mistook the signature for that of Ch. James, Bishop of London (J. C. Loudon) and supposing that the Bishop patronised the science of botany, wrote to him that His Lordship might do what he pleased with the giants of his famous avenue, except cut them down. The Bishop, we presume, must have been a good deal puzzled with this limited Church commission. Poor Mr. Loudon lost his chance." It is many years since Ceylon had attracted the attention of European Botanists. The great author of the Linnæan system with much taste and judgment, thus draws a comparison between the vegetation of Ceylon, and as it would appear that of his own native country Sweden:—"A delicious climate has granted to this Island plants of such variety and value, that scarcely any soil can vie with it, for the abundance of its aromatic productions. Whilst Pine Forests occupy our cold and sterile regions, in Ceylon the Cinnamon trees constitute whole groves, in such plenty indeed, that the inhabitants are accustomed to employ the wood for household furniture, for fuel and for cooking. Our orchards are planted with apples, pears, plums and cherries and other similar trees, but in Ceylon nothing is esteemed save the lofty Palms, among which the Coconuts chiefly afford the needful food, utensils and every thing necessary to mankind. The Caryota there yields a wine called Suri, and the Corypha or Fan Palms, extend their broad, smooth and plaited fronds, which serve for shade and shelter. They are most requisite for protection from the sun's rays, as well as from sudden showers, to the Natives, whose only garment is a scanty covering of linen. Date Palms and the superb Bananas decorated with wide spreading and glossy foliage, present in great profusion, racemes of the most delicious fruit, to say nothing of the more valuable productions with which the soil everywhere abounds, such as Mangoes, the Jack, Malay apples, Psidia Oranges, and Citrons, Cashewnuts, Averrhoas, &c. Our fields are sown with common Barley, and Rye, but those of the Cingalese receive nothing but Rice, which affords them flour and bread. Our marshes are covered with Cattle, their's with fragrant Amonum. Persicarias occupy our waste places; but with them grow different species of Pepper. In our meadows spring the Ranuncu'us, Plantains, Convallarias, and many other neglected plants; in theirs, numerous kinds of Hedysarum, Galega, Hibiscus, Justicia, Cliome, Impatiens, Amomum Myrtle, and Ricinus, besides numerous climbers, as Ipomœa, Dioscoræa Basella, Aristolochia, Ophioglosum, Phascolus Momordica, Bryonia, Vine, Cissus, Pothos, Loranthus, and Acrosticum. In the room of the meadow sweet and mints, the pastures in Ceylon are scented with Basil and the woods with Cinnamon. Everywhere occur the most precious Aromatics, Ginger, Cardamons, Galange, Costus, Arcorus, Schœnanthus, Calamus, Aromaticus, and flowers of the most exquisite color and structure and fragrance, such as Crinum, Pancratium, and Gloriosæ as well as those plants which saturate the night air with their delicious scent such as the Tuberose, (Polyanthus,) and Nyctanthus."—It was at this period that Burmann labored in Ceylon and the results were "Thesaurus Zeylanicus" a very creditable work at the period when published. Burmann lent his collection to Linnæus, who published descriptions from it, as appears from Sir J. Smith's tour on the Continent in 1793. The same author also mentions Herman's Ceylon Plants at Leyden and Copenhagen and that a copy was afterwards published by Sir Joseph Banks. Sir J. Banks seems to have been interested in Ceylon Botany, for Sir William Hooker studied in his museum preparatory to going out with General Brownrigg; unfortunately family occurrences prevented this taking place. In Wight and Arnott's Prodromus of Indian botany there is a very good account of the Indian Botanists; up to the time of Roxburgh, their works are of very little service in the present state of Indian Botany with exception of the edition of Roxburgh's Indian Flora by Wallich, which is very good. Royle, Wight and Arnott and Wallich are in India what Hooker and Lindley are at home, and we owe to them a most complete knowledge of Indian botany: all their works are most instructive. Meanwhile to return to Ceylon botany:—Moon the first Superintendent of the Botanic Gardens, established at Peradenia seems to have performed his duties in a most creditable manner. In 1824 he published a list of Ceylon Plants, which is too well known in the Island to require any recommendation; a few mistakes have crept in and many of the genera have been altered since 1824; other plants are to be added, but still it is most useful up to the present improved age of the science. He must have formed a good Herbarium, but only a few plants are now extant, so that no means are left of ascertaining the plants which were undescribed in Moon's time and consequently named by Moon—except by the Native names and they are fluctuating and not always correct where rare plants are in question.

Watson, Lear, and Normansell who succeeded Moon have done but little for Ceylon botany.

Previous to 1838 Colonel and Mrs. Walker paid great attention to Ceylon botany. Mrs. Walker had the advantage of being an excellent flower painter and her tracings of plants are considered very beautiful; their collection of plants went home to England in—1839 or—40 and is supposed to have added a very large list to our Flora.

Dr. Wight was on a visit to Ceylon in 1836: he made an excursion with Colonel Walker and

collected above 500 species of plants. After this a Mr. Nightingale collected for the Duke of Northumberland and a Mr. MacRae seems to have been in the Island: he has added to the grasses.

Mr. Bennett* on return from New South Wales visited Ceylon and has published some interesting particulars on the different varieties of the Coco Palm.

The Flora of Java is quite unknown here: the researches of Blume, Reinwardt, Dr. Horsfield and others might enable us to ascertain several of the species not indigenous to India.

Finally a Mr. Cumming brought an immense Herbarium of plants for sale from the Indian Archipelago about 1840 to London. A list of the Ferns have been published and probably contains many of the Ceylon species.

From the preceding remarks it will be observed that whilst in 1842 the state of knowledge of botany in Ceylon was at a very low ebb, materials had gone to England which may have enabled botanist's in England or India to form a very good estimate of our Flora, and indeed it appears that Lindley has drawn very largely on Ceylon for Orchideous Plants, although our present list in Moon is very limited. The Gardens are possessed of drawings of a very beautiful series of Ceylon plants which canno tall be ascertained by the scanty references to tobtained from its indifferent library. Such is the state of our knowledge up to April 1843. But I have here the pleasing duty of remarking that a few months may see a very improved state of our knowledge, as the Government has most liberally come forward in purchasing books of Modern reference which have already arrived and will shortly be open to the public. It is also expected that the labours of Colonel Walker and the knowledge of Indian botanists will shortly be made known in Ceylon and it is in contemplation to publish a corrected list of plants indigenous to the Island. Possibly some years may elapse ere our knowledge is very complete, but it cannot fail but that yearly much will be added to our Flora.

Botany is by many people considered a very dry study, and undoubtedly it is the grammar to horticulture, agriculture and higher branches of a knowledge of vegetation, usually allowed to be important in the daily routine of life. To those interested in it as a pursuit, it opens a very curious field of observation in the structure of plants and for many other considerations; and those who have mastered its difficulties will turn their attention to all the higher branches of the subject with singular success and unravel many of the mysteries of agriculture and commerce. I will briefly give a few instances: Cinnamon and Cassia have been known as articles of commerce from a very early period, as far back as some of the earlier Greek Historians. As such our merchants are perfectly acquainted with their peculiarities, but not so with the sources from which produced. It is true that the Dutch had cultivated the true Cinnamon plant, and so it was known how we got Cinnamon and it was certain that Cassia came both from Ceylon and India and must be known to those who had prepared it for the market. Now just about the period that Cinnamon had begun to fall in value, people in England began to ask what Cassia was, some said it came from a different tree from that producing Cinnamon, others supposed it to be an inferior produce of the Cinnamon tree, the tree allowed to grow old, or the bark of branches of a different year's growth. Of course the old Dutch writers were referred to and then it appeared that certainly there was a Cassia tree, as well as a Cinnamon tree, but when botanists began to look further, they found that scarcely two botanists agreed about the description of the Cassia tree although several had professed to describe it every correctly. Botanists in England began to fancy there might be many varieties of Cinnamon or of the true Cinnamon; so they got specimens of Cinnamon and Cassia and all the information they could on the subject, but just sufficient to leave a great deal to be said on both sides. In 1838 the question was at last taken up by the Madras Government and they went to work by obtaining specimens of Cinnamon and Cassia and reports upon them from the Government Agents of places where these articles were exported and were also so assisted by Colonel Walker and the Ceylon Government. The reports were very conflicting and unsatisfactory, but fortunately Government had always insisted on Specimens being sent and these were placed in the hands of Dr. Wight. Dr. Wight and other botanists were aware that a great many species of Cinnamon existed and many of these had been described by either Roxburgh, Blume or the Brothers Nees ab Essenbeck; so that although Dr. Wight could not in all instances determine the species sent, because they might be deficient in flowers or fruit, as the Government Agents might not in all instances be up to the requisites of a dried specimen for an Herbarium, yet in many instances he did discover what the species of Cinnamon was as described in books or as new species, and hence he at last was able to settle the question very determinately, and Cassia is found both to be an inferior preparation of the true Cinnamon tree and also the better portions of bark of a great variety of Cinnamon trees of different species and which do not yield true Cinnamon. Also that inferior Cinnamons are produced in various parts of the Indian Coast and these are of species differing from the true Cinnamon of Ceylon. Dr. Blume, enumerates in Java eleven species of Cinnamon-yielding aromatic barks and several of these are said to vie with the very finest Cinnamon of our market. Now I may here observe that Botany is certainly of some use. For when all the species shall have been described and the English merchants are satisfied that there are other good Cinnamons besides the true Cinnamon, many of the underrated Cinnamons will be estimated at their proper value, and if a Coffee Planter should find a good deal of Cinnamon on his estate and can discriminate his species, he will be aware of its exact value whether as Cinnamon or Cassia by ascertaining the name.*

A great many other instances might be cited with respect to our Medical Pharmacopeia. Drugs are purchased at a very high price from foreign countries, when it is probable that other species in our own Colonies are possessed of similar qualities, which might certainly supersede the more expensive articles, where indigenous. Sarsaparilla is one and various species of Convolvulus of this country might produce jalap without resorting to the Mexican or true jalap. It is only by a botanical knowledge of species that we could impart such knowledge or discovery to the public.

Gamboge is another article of commerce and there are Gamboges of various qualities produced from different trees which require botanical discrimination. It created a good deal of attention a few years previous and Colonel Walker was interested in the enquiry and in discovering the Ceylon species. Dr. Graham has at last settled the question deter-

* Dr. George Bennett, still living in Sydney.—ED. *T. A.*

* When Mr. A. M. Ferguson examined Weywelhena, Uva, in the early months of 1841, he reported that the undergrowth consisted largely of cinnamon, which had evidently been habitually cut for spice.—ED. *T. A.*

minately and the true Gamboge plant is found to be far more rare than the tree commonly supposed to produce the Gamboge of commerce. The latter is very rare and I believe not even indigenous to Ceylon, whilst the former (a common tree) produces a Gamboge which would be scarce saleable.

Some good articles have been written in the periodicals and newspapers of our Colony on articles of commerce or culture and it is reasonable to suppose that the Agricultural Society will do much for Ceylon on such points. It is also to be expected that Horticulture will extend thro' the exertions of individuals and that our Peradenia Gardens on the new footing will yearly add to the taste for improving fruits and vegetables and the introduction of foreign productions. Meanwhile it seems very desirable to ascertain the really indigenous Flora of Ceylon and the peculiar features of certain localities. With this view I shall lay before the public a few hints towards the Geographical distribution of our Flora, premising that it has been made up from a very short experience and from knowledge, derived, from my want of modern works of botany, from the older authors up to the time of Moon and the Prodromus of Wight and Arnott. As this is about the amount of knowledge of the usual run of residents in the Island, it may serve as a groundwork until a better article on the subject from some more experienced hand shall have been published.

Geographical Division of Plants in Ceylon.

Part of the trees and plants in Ceylon (and these the most common in occurrence as forming the mass of vegetation) are found nearly all over the Island in favorable situations. Being of hardy growth few are peculiar to Ceylon but extend over India and the neighbouring Islands, of such plants I have made a selection in Table 1st, it includes many of the handsomer trees and shrubs of Ceylon. Many of these must be familiar to every resident. The Soursop tribe, Country Almond, Guava, Jamboo, Coronet-tree, Ceiba or Cotton, Thespesia, Indian Olive, Pumplemos, Lemon and Orange, Tree-spurge, Coral, Sappan, · Peacock-flower, Horseradish-tree, Bauhinia, Cashew, Mango, Mulberry, Banyan, Jack, Breadfruit, Cassia, Cinnamon, Chaste trees, Teak, Forbidden fruit, Temple-flower, Palmyra, Betle-nut, Jaggherry-tree, Coco-Palm, Plantain, Screw-pine, Indian rubber tree, Sago, Papaw, Bamboo, Tamarind. Castor, Annotto, with trees, shrubs and flowers of less specious appearance and many weeds In some instances they have been introduced into hothouses in England, but not universally—for what is most common in tropical climates is sometimes neglected to be sent home and of this there is a very curious instance in the Banyan. No foreign production has been oftener quoted than the Banyan both in verse and prose by English writers and it has been well described by both Cordiner and Roxburgh some thirty years ago, yet two of the most popular writers of the day Lindley and Loudon have confused it with the Bo-tree (Ficus religiosa) a very different species, and Moon in his catalogue with Ficus Benghalensis, it really being the Ficus Indica and remarkable for its vast rooting branches, in which peculiarity it differs from both those other species of Fig. Major Forbes and the writer having sent Sir W. Hooker sketches of the Banyan under the name of Ficus Benghalensis, Sir W. published a detailed account of this tree, correcting the above errors, and stating that he suspected that English Herbaria are miserably defective in specimens of the true Banyan. His own, rich in the productions of our Eastern possessions, had not a single specimen in March 1841 and Dr. Arnott had but one indifferent specimen. It is called Manuga in Ceylon. On the subject of Banyans I will pass over Southey's beautiful description in the curse of Kehama and Colonel Sykes' famous tree in the Poonah collectorate which has 68 stems descending from the branches and capable of giving shade,* but I will mention a circumstance which has lately struck me as curious. Somewhere in the Asiatic Transactions Sir Wm. Jones says "it is true that minute ants are hatched in the ripe fruit of the Udumbara (or racemed Fig) whence it is named gamtephale; and the Pandits compare it to the mundane egg"—now although I have always looked upon Sir W. Jones as a very enquiring personage and very clever man, I in this instance at once set him down as following the theories of the school of 1552, who believed that Insects were *spontaneously produced!* and therefore not very much astonished had noted his opinion as rather curious with three of the accompanying marks (! ! !) exactly to denote my own opinion on the subject. We have the racemed Fig in Kandy and I had seen the fruit, but I must say I never took any steps to investigate Sir Wm. Jones' theory. However the other day I happened to bring home some of the fruit, of the Carpenter-fig. which I found growing on the root, and on opening some I found they contained nearly a tea spoonful of pure water, which is a curious instance of vegetable economy, and on opening another I discovered about a dozen ants inside. Now there was nothing remarkable in this had the fruit been penetrated, but on search I was obliged to confess that I could not discover any opening in any part of the fruit and consequently it is no wonder that Sir W. Jones thought the Pundits really correct. How they entered I shall leave you to determine, but suppose that the economy of the parent Insect is to introduce her eggs when the fruit is at a very early stage of growth, and that afterwards with the growth of the fruit the fissure becomes entirely obliterated. It is evident that the supply of water together with flowers and seed (all which are produced inside the fruit) are sufficient to support the ants, who are a very thirsty race. The Cingalese, who have naturally rather a turn for botany and the appropriation of all sorts of trees and leaves to medicine and curries, believe that Banyans have no flowers, and although you may not have sharper eyes than they have and can hardly point them out in the tree, a Botanist will shew a trick worth two of theirs, for on quietly turning the fruit inside out and attached to the inner skin you will find either the flowers or the seed which they afterwards turn into.

To return to the distribution of the Ceylon Flora, many of the trees and plants commonly spread over the Island are of great service and utility to the Natives and Europeans either as timber, fruits, medicines, dyes or economical purposes. In many instances the properties are known and have became available, but in other instances from what we read of respecting the use made of these trees and plants amongst certain tribes on the Continent of India or Burmese Territories it may be conjectured that they have been overlooked or neglected —through the spirited exertions of individuals in the Company's service most of these economical vegetable productions have been described under scien-

* Sixty-eight stems must be a mistake, as our comparatively youthful tree, near the Cinnamon Gardens, has hundreds of descending shoots. The concluding lines of Southey's description are:—

"So like a temple doth it seem, that there
A pious heart's first impulse would be prayer."
—Ed. *T. A.*

tific names and descriptions and consequently when our Ceylon Flora is botanically named, we shall without difficulty avail ourselves of the experience thus to be acquired. The greatest exactness is often requisite in describing plants of common occurance to prevent error. For instance much of the native steel of India is smelted by the use of a species of Mudar plant, the Calotropis gigantea (a common plant in Ceylon) and its root and bark is said by Lindley to be a powerful alterative and purgative and of importance in cases of leprosy and elephantiasis—but later researches prove the Mudar plant to be a different plant viz. the Calotropis procera which is not known in this Island and it seems very doubtful how far the Calotropis gigantea (or Curl flower) may share the qualities of the real Mudar plant, I think it was Dr. Wallich who published remarks on the real Mudar plant being the Calotropis procera. On the other hand Mr. Wilkinson in Feby. 1839 made known the native method of smelting steel, the ore used was magnetic oxide of iron 52 to 48 of quartz and was reduced in four hours by a furnace, to which was used charcoal fuel. Afterwards being placed in a crucible with dried wood of the Cassia auriculata and green leaves of the (Asclepias) Calotropis gigantea and a certain process used excellent steel is produced. If Mr. Wilkinson has made no mistake in this plant there seems no reason why the natives here should not convert old iron into steel with facility, both plants being of common occurrence on the Coast. It is not the intention of this paper to enter into the economical uses of the vegetable Kingdom of the Island. A very bulky volume might be produced on the many valuable resources that exist and that are known and made use of by the natives of other countries. I restrict myself to the botany with casual remarks to shew to how many objects of interest, use, or curiosity it will lead. Passing from Table I. we come to the plants of the Maritime Provinces or sea coast of Ceylon. It seems to have been partially explored at Trincomalee, and Mr. Moon has visited Negombo, Putlam and Jaffna, but so very little is known respecting their Floras, that we are really inclined to look upon them as unexplored botanically, so that in reality Table 2 is merely that part of the coast extending from Colombo towards Galle, and it is supposed that the general features will extend to the whole coast of Ceylon, but will vary in certain localities. Putlam for instance having saltwater lakes will have its peculiar characteristics in such localities, and Jaffna seems to differ considerably in climate and productions from the southern portions of the coast. In the neighbourhood of large rivers, it is possible that the productions of a more hilly country may casually occur, as transported in their seed vessels during floods and the monsoon season. However theoretical this view may at first appear it is known to be practically correct to a small extent and that in this way volcanic Islands and Coral reefs become vegetated in the Ocean and Islands thrown up by the embankment of sand in rivers. In connection with this subject, Lyell mentions Geology vol. II "Fruits indigenous to America and the West Indies, such as Mimosa scandens, the Cashewnut and others" (all natives of Ceylon,)* have been known to be drifted across the Atlantic by the Gulph stream, on the western Coast of Europe, in such a state that they might have vegetated had the climate and soil been favorable, among these the Guilandina Bonduc, a leguminous plant, is particularly mentioned, as having been raised from a seed found in the West Coast of Ireland." The Guilandina Bonduc is very common all over the interior of this Island. But altho' this is a proof of the very great distance that seeds may be floated without destroying in every instance the vegetating powers, it does not seem sufficient for our purpose, and so I shall quote Mr. Darwin's description of the Keeling Lagoon Islands. He says "I will now give a description of the Natural History of these Islands which from its very paucity, possesses a peculiar interest. The Coconut tree at the first glance seems to compose the whole wood; there are however, five or six other kinds, one of these grows to a very large size but, from the extreme softness of its wood is useless; another sort affords excellent timber for shipbuilding. Besides the trees the number of plants is exceedingly limited and consists of insignificant weeds. In my collection, which includes I believe nearly the perfect Flora, there are twenty species, without mentioning a Moss lichen and fungus. To this number two trees must be added; one of which was not in flower and the other I only heard of. The latter is a solitary tree of its kind in the whole group and grows near the beach, where, without doubt, the one seed was thrown up by the waves. I do not include in the above list the Sugar Cane, Banana, some other vegetables, fruit trees and imported grasses. As these Islands consist entirely of coral and at one time probably existed as a mere water-washed reef, all the productions now living here must have been transported by the waves of the sea. In accordance to this the Flora has quite the character of a refuge for the destitute. Prof. Henslow informs me that of the twenty species, nineteen belong to different genera and these again to no less than sixteen orders." Darwin also mentions again respecting another of these Islands. "The following seeds are supposed to be driven by the N. W. Monsoon to New Holland and from it to the Island by the S. E. trade wind. The Kimiri of Sumatra and Malacca, the Coconut of Balei, the Dadap of the Malays, also masses of Java Teak and yellow-wood and red and white Cedar and the blue Gum tree of New Holland. All creepers retain their vegetating powers, softer productions as the Mangosteen do not germinate." In the tropics where certain trees and plants grow over the margin of the Ocean and the young saplings often vegetate in the sand and mud both of it and of rivers many may be supposed to be floated after storms far from their place of birth, whilst more inland productions are frequently transported by the agency of birds, or such as have winged seeds by the power of the winds. I can myself give what I believe to be an example of the agency of the Mahavillaganga. On the top of Adam's Peak and about Nuwera Ellia is found in abundance the gigantic Lobelia excelsa, a very handsome plant attaining the height of 12 to 15 feet. It is a mountain plant, excluded from the jungles, but delighting in bare elevations and the sides of rocky streams. Its nearest approach to the low country is I believe Pusilawe and Ambegammie, growing in the latter country in great abundance on the banks of the River. A few months ago in passing the Trincomale ferry I observed this plant on the steep bank overhanging the river and I have little doubt but that the seed had been laid after one of the monsoons when the river is much swoln and the plant in seed. After some experience of the Kandyan country I am able to say it is the only plant of this Lobelia growing in the neighbourhood. Upon the whole it seems probable that several plants and

* If "native", is used in the sense of indigenous, then the cashew is certainly not native. It cameto Ceylon and India, like the pineapple, chilli and so much else, from the western hemisphere.—Ed. *T. A.*

trees may thus migrate to a colder climate, but they are constantly checked in growth where circumstances and climate are unfavourable by the mass of vegetation, hence only a certain number of hardy plants will succeed. The same may be said of plants introduced by the Agency of man. Those of European growth rarely succeed in naturalising themselves in the low country, but South American are in many instances perfect weeds. Asclepias Curassavica would really be believed to be an indigenous weed, had it no native name and many of the productions of our gardens will be found in the same neighbourhod wild. Again at Nuwera Ellia the Cape Gooseberry, (Physalis flexuosa) originally introduced, has spread with the greatest rapidity and altho' a weed contributes to the scanty resources for cookery in that part of the mountains. In every uncultivated country plants best adapted to the climate of the place and soil will prove the more hardy, and will supplant the more delicate species. Thus in ascending mountains, vegetation will constantly vary first from changes of strata and secondly because the atmosphere becomes colder as you ascend; but there are other causes—Vegetation depends much upon effects of light and solar influence. Leave a barren gravelly soil to itself and it will first be covered with sedge and grass, but when once weeds have effected a footing many of these grasses will disappear, Next will come under shrubs and creepers, so that the cleared space is again converted into jungle. Lastly should trees also spring up, by the time they have shaded the under shrubbery from the effects of the sun's rays, it will have materially altered in character. From such causes there must be a constant change of vegetation in mountainous countries and also in the lower tracts, but more especially in the former. I have been informed by Coffee-planters that after clearing jungle many plants and shrubs spring up which were not previously known in the Forests and it is easily accounted for on those principles. I have myself Pavetta latifolia from cleared Coffee land, after in vain searching for it in the neighbouring jungle.

WYNAAD PLANTING NOTES.

COFFEE AND CINCHONA.

The crops are a failure with very few exceptions. This is due to the unusual amount of rain, which, coming just when it should not, destroyed the blossom so that very little indeed of it has set. This misfortune was later on followed by another, in the shape of hail storms and hurricanes, so that trees without a berry on them are with a few exceptions, the melancholy order of the day. Of course there has also been any amount of leaf disease, and any amount of this to follow. The appearance of the trees is splendid (just now) for *next* year, the extraordinary early showers having forced forward an enormous amount of new wood. What will be the effect of this for next season, remains to be proved. Weeds are rampant and hardly a cooly has come in. Influenza and cholera are so bad in Mysore that the maistries declare they cannot make up their gangs, in which case we must bid a fond farewell to our advances and our hopes of planting up new clearing. Influenza has also been pretty bad here, but not equally so in all places. The Chermas have suffered most, and curiously enough the locals, Moopas and so on, have very generally escaped. A neighbour graphically described his labour supply thus: "All my coolies are sick except six, and these are chiefly employed in digging graves for the rest!"

But we do not altogether despair. I think I have more than once commented upon the cork-like nature of planters. Fortune is amazingly fond of popping us under water, but somehow we always come up again, and though leaf disease and the elements have done their best to annihilate us this year, we can look at the "new wood," and congratulate ourselves on possibilities for next. It may even do the trees good to have a rest. At the same time it behoves us to look around for more strings for our overstrained bow. Liberian, is first favorite just now, and many experiments are being made with it, and good results are reasonably expected, in spite of the adverse criticisms of our Ceylon brethren. We, however, argue that it was bad management on their part which was more to blame than the Liberian itself. They acknowledge to planting it in the open, topping and pruning it, and otherwise treating it as we used Arabica long time ago; moreover they were not sufficiently particular in the selection of the seed. Our short experience goes to prove that Liberian must be neither topped nor pruned, and that although there *are* many varieties capable of getting leaf disease, but *one* exists which has hitherto defied the enemy. Time of course can only show if this will be the case when the Liberian is planted in large quantities. But no one can deny that it is certainly at present much more hardly and easy of cultivation than its Arabian brother.

We hear of projects for opening old land for tea on several estates where coffee and cinchona have been making a rapid exit. It is evident that tea grows well here, as proved by ocular and financial demonstration, and there is no reason to doubt the same results in other parts of the district. The working it is the chief difficulty, as just when the principal flushes are on the coolies have departed to their country, and labour is exceedingly difficult to obtain. And what am I to say about cinchona. Ichabod! Ichabod! The succirubra is suffering very much from canker, or some mysterious disease, apparently inexplicable. A great authority has lately come amongst us, who says the trees chiefly want rest—(like the coffee perhaps) and that we should only shave them *once in three years or so*. A very good practice doubtless for Government, which, happily for itself, does not depend on its plantations; but a poor look out for us, who evidently do. In the meantime succirubra is taking the matter out of our hands, and retiring into a blessed nirvana of its own. The ledgers seem inclined to fight it out, and the shaving so far has done them no harm. And finally, I will conclude by bracketing our condition after the manner of Robinson Crusoe when things were not very brilliant with him, and taking comfort thereby:—

No crop ... High prices, and heaps next year.
Leaf disease ... Liberian.
Canker ... Tea.

So up come the planters—Heading the list of good things, and its no use for Dame Fortune to try and drown us out, yet a while at least.—*Madras Times.*

NOTES ON PRODUCE AND FINANCE.

THE SIZE OF TEA CHESTS.

The cry in the Lane is that some planters in India and Ceylon do not appear to pay any attention to the sizes of the chests or half-chests in which they pack their teas. The ordinary custom of the trade is to consider a chest as holding about 100 lb. of tea, and a half-chest as holding about 60 lb. It is pointed out that packages holding less than these weights are not so readily saleable, as a wholesale dealer, when he thinks he has sold say a dozen chests holding jointly 1,200 lb. is disappointed when he finds he has taken up his time in selling 900 lb. only. A large proportion of Indian and Ceylon half-chests of tea hold only from 40 lb. to 45 lb. of tea, the chests only 75 lb. to 80 lb. This involves an expenditure of much more wood in proportion to the weight contained than is at all necessary, more freight on the needless wood,

and considerably higher proportionate dock charges, as will be seen in studying the scale. These intermediate packages are also of not the slightest benefit to the retailers, who frequently have to make troublesome enquiries as to the weights and tares of parcels, now that the trade custom is depsrted from of boxes representing ahout 20 lb. of tea, half-chests 60 lb. and chests 100 lb. Larger sizes for either of these classes would also be objected to, though to a lesser degree, as they might be too heavy for the smaller buyer.

TEA RETAILED AT A SHILLING.

The competition amongst retail tea dealers is going on so merrily, that the question when and where it will stop becomes an important one. This is the description of the state of things in Wales sent by the correspondent of a contemporary :—"Any retailer, whether he does his business in a village or town in the principality, in an out-of-the-way corner or in the leading street, will tell you that tea above 2s per lb. remains a "dead stock" on his premises. There was, it is true, a period in the history of the retail trade in Wales when 3s was the average price paid for tea by the people, but now a large percentage of the people do not pay more than 1s 4d for their tea, and this is not to be wondered at when we find almost in every town 'the finest tea in the world' advertised at 1s 10s and 2s per lb. If the 'finest tea in the world,' as our large retailers inform the public can be hought at 1s 10s and 2s, one can hardly expect the public to go in for a high-priced article. The manager of one of the largest retail businesses in South Wales informed me, in reply to a question, that they sold more tea at 1s 4d than at 1s 6d, 1s 8d and 2s combined !—the one at 1s 4d being closely followed by a tea they retailed at 1s per lb." The tea retailed at 1s per lb. must be a refreshing and invigorating compound.

INDIAN AND CEYLON TEA IN AUSTRALIA.

The *Sydney Daily Telegraph* in a long article on the subject of Chinese *v.* Indian Teas in Australia says:—Indian and Ceylon planters are now making determined efforts to win this (the Australian) market, too, from what they are pleased to call the "post and rails" of inferior teas chiefly imported at present. Their efforts, at any rate as far as New South Wales is concerned, would seem to be meeting with some degree of success. Thus, out of a total import of tea in 1887 of 6,518,695 lb. only 161,584 lb. or 2 5 per cent. came from India or Ceylon. Next year 7,461,621 lb. were imported, 426,383 lb. or 5 7 per cent. being from the countries named, while in 1889, 549,535 lb. of Indian and Ceylon teas arrived, being 8·1 per cent. of the total importations of tea for the year. The significant changes which are taking place in the tea trade cannot fail to be of interest to Australians, for perhaps no other people in the world are to an equal extent tea drinkers. How deeply concerned the inhabitants of these Colonies are in all that affects the tea trade will be readily understood when it is stated that here the average consumption of tea per head of population is no less than 121 oz. per annum, as compared with 73 oz. in Great Britain, 21 oz. in the United States of America, and 1 oz. in France and Germany. Any changes, therefore, which bring to the market a cheap tea of good quality will be welcomed.

THE PREPARATION OF CEYLON TEA.

The *Grocer* calls attention to what it terms "an important defect in connection with the preparation of Ceylon teas," which has "just been discovered by the import trade," who are under the impression that this article is but imperfectly cured by the growers before it is shipped to England, and the consequence is that its commercial value is considerably less than it would otherwise be if tea were made as nearly perfect as possible while it wss in the factory near where it was grown. The chief complaint is of the overfiring of these teas, which by being deprived of their best preservative qualities are rendered more liable to depreciation, and consequently are less appreciated by those dealers who would prefer to buy them for storing away rather than for immediate use. Messrs. I. A. Rucker and Bencraft, Mincing Lane brokers, in their circular of the 15th inst., speak very strongly on the subject, where they say that "we feel called upon to warn our readers against a practice that has been in evidence lately, that of incompletely withering and partially fermenting teas, to give what is supposed in some quarters in Ceylon to be 'grip' or 'point' to teas which otherwise would be good thick coloury useful qualities. The consequence is that a good many parcels have come forward with a very mixed infused leaf, green and undesirable. These teas no doubt have a character of their own, and may here and there be useful for blending. They can, however, for this purpose only be used sparingly, for the incomplete withering and short fermentation cause an absence of 'colour' in cup. The trade don't like it, and the ultimate result will be loss to the planter. We are still of the same mind as we were when we wrote three years ago, that one general fault of Ceylon teas is that they are on the whole over-fired, and that this partly accounts for their non-keeping qualities." This "general fault," says the *Grocer*, is indeed a serious one, and ought certainly to be remedied without delay. There are persons, however, who have doubted the truth of this charge of defective curing in the manufacture of Ceylon teas, and have refused to be convinced of the alleged want of skill and judgment in preparing the different kinds for this market. To satisfy the minds of these people, and place the question beyond dispute, we are also informed by the same authority that last year it was determined to try an experiment for the purpose of ascertaining which of the two sorts of tea were really preferred by the trade here, the "over-fired" or the "under-fired;" and accordingly instructions were sent out to Ceylon to prepare a special invoice for sale, one part to consist of tea less fired than the other, and the remaining half to be treated in the same way as heretofore. This plan being adopted, "underfired" teas on their arrival in London were pronounced to be 2d to 3d per lb. hetter than those that were completely or, as it is termed, "over" fired. Further than this, the samples were carefully stowed away and sealed up for twelve months, and upon being opened and tasted the under-fired teas in each case retained the same advantage over the fully-fired portion, both with respect to their excellent keeping qualities and their colour in the cup. Nothing is easier to understand than that a delicate article like tea, when fired till it is extremely dry, is more apt than ever to absorb every kind of moisture with which it may come in contact, either in the steamer afloat or in the warehouse ashore, and if so, can it be the least surprising that deterioration should set in directly the tes is turned out of hand? It is well known that in firing their teas the Chinese do not extract the last drain of moisture from the freshly gathered leaves, but apply the heat so judiciously as to preserve all the principal virtues of the tea without impairing some or destroying others; and if there are still any individuals who doubt the efficacy of the method just described in giving the quality of the tea a more lasting character, let them hear in mind that, although China teas are none of the strongest, they will for years keep close to their original flavour and condition, even if they do not actually improve hy being kept in reserve until they are thoroughly matured. The *Produce Markets Review* on the same subject says: —Complaints as to the falling off in the quality of Ceylon teas are, however, now extremely general, and it cannot be too strongly impressed upon planters that prompt steps are necessary, either by refraining from weakening the trees by overplucking, or by judicious manuring, or other means, to maintain these teas in the high estimation in which they have been held by the public. A great deal of this falling-off in quality is said to be due to the custom of under-fermenting and over-firing, which reduces the sap, and produces thin flavoury teas, very liable to rapidly deteriorate in quality. It is the thick juicy teas which have made the present reputation of Ceylon growths, and planters should remember this.

TEA AND COFFEE FOR THE PUBLIC.

"Why," it was asked on Tuesday by the *Daily Telegraph*, "on these great holidays (*videlicet* Bank holi-

days) is so little provision made for the supply of tea, coffee, and light refreshments." The enquiry has received a remarkably prompt reply from the pecu liarly authoritative voice of Messrs. Spiers and Pond. That eminent firm of refreshment contractors have given a very plain and pertinent answer to the question of the *Daily Telegraph.* That question, say Messrs. Spiers and Pond, is not difficult to answer. "The great general public will not, and do not, when taking their holiday patronise in any appreciable number the places devoted to the supply of tea, coffee, and light refreshments only." It is sad, but it is so. And of the fact that it is so Messrs. Spiers and Pond have had very practical proof at the Royal Military Exhibition. There they have erected two large pavilions, a temperance and an intemperance pavilion, with the result that, while the working expenses of the two are exactly the same, the temperance pavilion only does about one-sixth part of the trade which falls to the share of its rival. Moreover, the tea and coffee tents of Spiers and Pond at the Zoological Gardens, which were specially commended by the *Daily Telegraph,* were chiefly crowded on account of the bottled beer to be obtained within them. The experience of Messrs. Bertram and Co., of the Crystal Palace, appears to be the reverse of that of Messrs. Spiers and Pond. They write:—On the question mooted by Messrs. Spiers and Pond in their interesting letter as to the consumption of non-intoxicating drinks by the people on days when they most do congregate, such as bank holidays, we think it will be of interest to state that our experience at this present does not coincide with that of your correspondents. Whether it is due to the conditions of the Crystal Palace or the facilities that are given there for the easy practical supply of non-intoxicants, the proportion of money received in the refreshment department on such occasions for tea, coffee, cocoa, milk, aerated waters, and light refreshments is two-thirds of the entire receipts, a notable increase on the one-sixth calculated by our friends.—*H. and C. Mail,* May 30th.

"KEW BULLETIN."—The June number, now before us, contains an article on compressed or tablet tea, dealing with the methods of its manufacture at Hankow, and at Chungking in Thibet. Timber trees of the Straits Settlements forms the subject of another paper. It contains much useful information on a great number of different species, giving the weights of a certain number of cubic inches, and of a cubit foot of each and native names of the trees. Cotton in West Africa forms the subject of another paper.—*Gardeners' Chronicle,* June 14th.

SUBSTITUTE FOR IVORY:—A commercial reportere, writing from Sheffield, says:—"The hulk of thy ivory sold at the periodical sales finds its wae here, and enormous quantities are used in thd cutlery and silver trades. The growing scarcity an-ever-increasing cost of ivory has, however, compelled manufacturers to turn their attention to the production ef various substitutes. One of these is celluloid, and thousands of tons of this material is annually worked up in Sheffield. One firm alone who made a speciality of this article last year, sold upwards of 1,800 dozen table-knives with ivory-grained celluloid handles. Great improvements have been made in the manufacture of this material recently, and certainly the prejudice entertained against it is not shared by Sheffield cutlery manufacturers, who boldly assert that it is superior to ivory in some respects, although it only costs about one-sixth the money. No amount of heat will cause combustion unless the celluloid is brought into direct contact with flame It stands hot water better, and retains its beautiful creamy polish longer than ivory, for which it seems to be a really perfect substitute so far as Sheffield trades are concerned."—*O. Mail.*

COFFEE IN THE KAREN HILLS.—A contemporary says:—"Among the attempts already being made to start the tea and coffee industries in the hilly districts of Burma, the Nancho estate in the Karen Hills seems to promise well. The coffee grown on this estate has been found to be of excellent quality and has sold at good prices, and tea could also be produced in paying quantities but for the great scarcity of labour which at present exists. In the early part of last year the prospects of the coffee crop looked remarkably bright but a calamity of an extraordinary and unforeseen kind nearly wrecked the small plantation. This was nothing else than an invasion of travelling rats, which in two nights nearly stripped all the trees of their fruit, cutting off the shoots and small branches and leaving the trees to all appearance as if severely pruned. The rats appear to have been animated purely by a spirit of destructiveness, for the fruit of the trees was untouched, but as the fruit was then only half-grown the loss was very great. The ultimate yield was only 5,400 lb. as compared with 12,000 lb in the previous year. It would be interesting to have some particulars about these migrating rats, and Mr. Cotes would do well to direct his attention to the subject, as the plague seemes to be an entirely new one. Fortunately the trees on the Nancho estate have recovered rapidly, and the blossoming this year has been abundant and has set well, so that a large crop is expected."—*Pioneer,* May 22nd.

CEYLON EXPORTS AND DISTRIBUTION 1890.

COUNTRIES.	Coffee cwt.			Cinchona.	Tea.	Cocoa.	Cardamoms.	Cinnamon.		Coconut Oil.		Plumbago.
	Plantation	N'tive	Total.	1890 Branch & Trunk lb.	1890 lb.	cwt.	lb.	Bales lb.	Chips lb.	1890 cwt.	1889 cwt.	1890 cwt.
To United Kingdom ...	38723	100	38823	3992315	23053500	6516	101920	394539	149614	3402	57070	66899
" Marseilles ...	125	...	125	12500	145	30	...	43900	2800	...	...	...
" Barcelona ...	...	...	...	...	...	...	...	22000	...	...	...	...
" Genoa ...	12	...	12	...	950	...	...	35725	11424	696	908	...
" Venice ...	71	232	303	70412	409	...	...	4000	11200	...	...	...
" Trieste ...	7825	...	7825	252	1130	...	...	3900	8848	3490	3777	...
" Odessa ...	32	...	32	...	15	...	...	...	...	99	2211	...
" Hamburg ...	296	...	296	...	26814	768	1131	126300	52772	3304	3098	19617
" Antwerp ...	12	20	32	81057	115	...	...	7000	5600	...	1492	9409
" Bremen ...	18	...	18	...	9549	751	...	14606	...	...	...	3428
" Havre ...	...	100	100	...	...	...	...	10000	...	...	4578	...
" Rotterdam & Amsterdam ...	3	...	3	21384	...	55	...	...	11200	10	...	1616
" Africa ...	16	...	16	...	17595	...	...	5000	...	...	...	...
" Mauritius and Eastward	153	168	321	...	22024	498	...	7500	...	29951	...	...
" India ...	719	708	1437	...	53122	...	80528	5000	...	35579	7607	..
" Australia & New Zealand	4525	828	5353	...	1043184	1	40	2260	...	1029	1737	242
" America ...	1755	...	1755	51409	93003	1389	617	50728	...	15028	62726	80253
Total Exports from 1st Jan. to 3rd July 1890	54285	2166	56451	4229329	24321555	9408	184236	732458	253458	92588		181464
Do 1889	36067	3799	39866	4933965	17850314	8895	157804	1148739	332154	145204		224869
Do 1888	[illegible]9513	3316	82928	6295555	11197327	8982	160584	619693	358267	166524		109797
Do 1887	115049	5169	120276	6641744	6076164	12667	184560	445064	131736	115431		114377

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, 5th June 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	Slightly softish to good hard bright ...	£7 a £8 15s
Yellow ...	Do. drossy & dark ditto...	95s a 105s
CINCHONA BARK--Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 9d
	Branch	1d a 3d
Red	Renewed	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings	2d a 5d
	Branch	1d a 3d
	Twig	1d a $1\frac{1}{2}$d
CARDAMOMS Malabar	Clipped, bold, bright, fine	1s 6d a 2s 9d
and Ceylon	Middling, stalky & lean	10d a 1s 6d
Alleppee	Fair to fine plump clipped	1s 4d a 3s 4d
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, bgt.	1s 6d a 2s 8d
Long Ceylon	Middling to good... ...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill ...	$7\frac{1}{2}$d a 1s 7d
2nds	,, ,, ,, ,, ...	7d a 1s 4d
3rds	,, ,, ,, ,, ...	6d a 1s 2d
4ths	Woody and hard	$5\frac{1}{2}$d a 11d
Chips ...	Fair to fine plant... ...	$2\frac{1}{2}$d a $7\frac{1}{2}$d
COCOA, Ceylon	Bold to fine bold ...	106s a 115s 6d
...	Medium	95s a 105s
	Triage to ordinary ...	60s a 90s
COFFEE Ceylon Plantation	Bold to fine bold colory...	104s a 110s
	Middling to fine mid. ...	101s a 103s
	Low mid. and Low grown	95s a 98s
	Smalls	94s a 97s 6d
Native	Good ordinary	90s a 95s
Liberian ...	Small to bold	85s a 93s
East Indian ...	Bold to fine bold... ...	104s a 115s
	Medium to fine	100s a 105s
	Small	93s a 98s
Native	Good to fine ordinary ...	90s a 95s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £22 10s
FIBRE, Brush ...	Ord. to fine long straight	£15 5s a £28
Stuffing ...	Coarse to fine	£5 a £18
COIR YARN, Ceylon ...	Ordinary to superior ...	£13 a £30
Cochin ...	Ordinary to fine	£12 a £36
Do	Roping fair to good ...	£12 a £16
COLOMBO ROOT, sifted ...	Middling wormy to fine...	10s a 18s
CROTON SEEDS, sifted ...	Fair to fine fresh... ...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold... ...	65s a 72s
,,	Small and medium ...	32s a 43s 6d
Rough	Fair to fine bold	21s a 34s
... ...	Small	21s a 23s
GUM ARABIC, Madras ...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	9s a 12s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES Pale, ...	Good to fine picked ...	8s 9d a 9s 6d
	Common to middling ...	8s a 8s 6d
	Fair Coast...	8s 6d
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	$\frac{5}{8}$d a $\frac{3}{4}$d
LEMON GRASS ...	,, ,, ,, ,, ...	$1\frac{1}{2}$d a $1\frac{3}{4}$d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy }	$5\frac{5}{8}$d a $6\frac{1}{2}$d
Alleppee & Cochin ,,	,, good ,, }	
Tellicherry, White ...	,, ,, ,, ...	1s 6d a 1s 9d
PLUM BAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 11s 6d
dust ...	Ordinary to fine bright ...	5s a 9s
RED WOOD	Fair and fine bold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to good flavor ...	£30 a £58
Do. chips ...	Inferior to fine	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	5d a 8d
	Fair middling medium...	2d a 4d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	15s a 16s
Do. ...	Mixed middling [bright	14s a 15s
Do. ...	Bulbs	10s a 12s
Cochin ...	Finger	10s a 11s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	18s a 25s
2nds	Foxy & reddish 5 a 8 ,,	15s a 20s
3rds	Lean & dry to middling under 6 inches ...	10s a 14s
4ths	Low, foxy, inferior and [pickings	3s a 8s 6d
FROM BOMBAY AND ZANZIBAR.		
ALOES, Soccotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	85s a 38s
	Ordinary and middling...	30s a 33s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb }	Good and fine bright ...	$5\frac{3}{4}$d a 6d
	Common dull to fair ...	$5\frac{1}{4}$d a $5\frac{5}{8}$d
Stems...	Common to good ...	$1\frac{3}{8}$d a $1\frac{1}{2}$d
COCULUS INDICUS ...	Fair ...	12s a 13s
GALLS, Bussorah & Turkey ℔ cwt. }	Fair to fine dark blue ...	52s 6d a 57s 6d
[cwt.	Good white and green...	40s a 50s
GUM AMMONIACUM per	Blocky to fine clean ...	20s a 50s
ANIMI, washed, ℔ cwt.	Picked fine pale in sorts,	£10 10s a £13
	part yellow and mixed	£9 a £10
	Bean & Pea size ditto ...	£5 a £8 10s
	amber and red bold ...	£8 a £11
scraped...	Medium & bold sorts ...	£4 a £7
ARABIC E.I. & Aden ..	Sorts	32s a 75s
per cwt. Ghatti ...	Sorts to fine pale ...	20s a 70s
Amrad cha	Good and fine pale ...	50s a 65s
	Reddish to pale brown ...	25s a 45s
ASSAFŒTIDA, per	Clean fair to fine ...	26s a 34s
cwt.	Slightly stony and foul ...	20s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 30s
MYRRH, picked ,,	Fair to fine pale ...	£5 a £6 10s
Aden sorts	Middling to good ...	72s 6d a 80s
OLIBANUM, drop	Fair to fine white ...	40s a 55s
per cwt. ,,	Reddish to middling ...	27s 6d a 37s
pickings...	Middling to good pale ...	12s a 20s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER Mozambique, }	red hard ...	2s a 2s 6d
per lb. Ball & Sausage }	white softish ...	1s 5d a 2s
	unripe root ...	8d a 1s 6d
	liver ...	1s a 2s
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per oz.	Nearly water white ...	4d a $4\frac{1}{4}$d
2nds ,, ...	Fair and good pale ...	$3\frac{5}{8}$d a $3\frac{3}{4}$d
3rds ,, ...	Brown and brownish ...	$3\frac{1}{4}$d a $3\frac{1}{2}$d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 6d
	Common foul and mixed	9d a 1s 10d
Rangoon ...	Fair to good clean ...	2s a 2s 4d
Madagascar	Good to fine pinky & white	2s 4d a 3s
	Fair to good black ...	1s 11d a 2s 2d
SAFFLOWER ...	Good to fine pinky ...	60s a 70s
	Middling to fair ...	40s a 60s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	23s a 24s
,, ...	Common & middling soft	12s a 23s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb.	Middling to fine ...	$2\frac{1}{2}$d a $3\frac{1}{4}$d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ℔ cwt.	Good, pure, & dry white }	150s a 160s
Japan ...	,, ,, pink }	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	38s a 41s
	Pressed	nominal
Block [per lb.	Good ...	27s 3d
GUTTA PERCHA, genuine	Fine clean Banj & Maca- [sar	3s 6d a 4s 6d
Sumatra...	Barky to fair	2s a 3s 4d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	1s 10d a 2s 9d
	Inferior and barky ...	1s 4d a 1s 9d
NUTMEGS, large, per lb...	57's a 80's, garbled ...	2s $8\frac{1}{2}$d a 4s
Medium ...	83's a 95's ...	2s $7\frac{1}{2}$d a 2s $8\frac{1}{2}$d
Small ...	100's a 160's ...	2s a 2s 7d
MACE, per lb. ...	Pale reddish to fine pale	2s 8d a 3s 3d
	Ordinary to fair ...	2s 4d a 2s 7d
	Chips and dark ...	1s 10d a 2s 3d
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 2d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	9d a 1s 1d
	Dark, rough & middling	3d a 7d
SAGO, Pearl, large, ℔ cwt.	Fair to fine ...	17s a 17s 6d
medium ...	,, ,, ,, ...	16s a 17s 6d
small ...	,, ,, ,, ...	12s a 13s 6d
Flour [per lb.	Good pinky to white ...	8s a 12s
TAPIOCA, Penang Flake	Fair to fine ...	$1\frac{7}{8}$d a $2\frac{5}{8}$d
Singapore ...	,, ,, ...	$1\frac{7}{8}$d a $2\frac{1}{8}$d
Flour ...	,, ,, ...	10s a 16
Pearl ...	Bullet, per cwt. ...	22s
	Medium ,, ...	17s a 18s 6d
	Seed ,, ...	16s 6d a 17s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for July :—

AGRICULTURAL THEORIES AND FACTS.

BEFORE Science and especially Chemistry lent its aid to explain the nutrition and feeding habits of plants, there was much speculation on these subjects, and a number of theories were put forward, which in the light of our modern scientific knowledge appear absurd enough, but judged with regard to the position of Agricultural science at the time they were propounded, are sufficiently plausible. We may notice among others the Excretory Theory of De Candolle, which after being long abandoned, a countryman of the author who came to this Island professing ability to cure the dreadful coffee-leaf-disease, was bold enough to revive. De Candolle founded his theory not only on a false analogy but on what we now know are fictions. Having observed that the excretions of animals were found useful and beneficial as supplying the food ingredients of plants, and that an animal will not thrive and indeed will steadily decline in health if it lived surrounded by its own excrement, he argued that certain families of plants could not continue to grow on the same land for an unlimited period owing to their excreting certain substances which are hurtful to the individuals of these families; but that this excrementitious matter would not be hurtful to other families, and in fact would be found beneficial. Clover or Beans for instance could not be grown continuously for any length of time so as to produce healthy crops, but when grown at intervals together with cereals &c. they showed no signs of deterioration. This according to De Candolle was owing to the Leguminosæ excreting certain substances which, accumulating in the soil, became a source of harm—the crop then growing in what may be said to be unsanitary conditions; but the excretions of the Leguminosæ were supposed to benefit the Gramineæ and *vice versa*. It is granted that any crop grown continuously on the same land without artificial aids, to the exclusion of all others, will eventually become less productive and more weakly and unhealthy; but what is the reason of this? The theory we are at present concerned with, plausible as it appeared in De Candolle's day, did not continue so for long; for while the Botanist would not acknowledge that plants were capable of excreting substances through their roots (as De Candolle supposed), it was further objected by those who gave any attention to the matter, or made any attempt to test the theory, that no excretions of a noxious character could be pointed out as accumulating in a soil under the conditions indicated. Thus the excretory theory was shown to be based on suppositions and had no facts to support it. It was therefore no wonder that after a little time the mere mention of it was received with ridicule

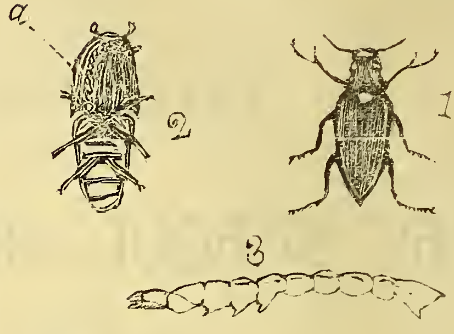
Another theory, which after being accepted with credulity inspired by the distinguished author of it, was also destined to be abandoned before long, was the Mineral Theory of Liebig. Baron Liebig held that plants got all their nitrogen from the atmosphere which was an unlimited source of this most important element of plant-food; the mineral

food which was derived from the soil was however liable to exhaustion, and hence the only manures a plant would need for its healthy growth were of a mineral nature. Liebig was so convinced of this that he went the length of preparing a standard manure which came to be most extensively sold for a time; but alas, further knowledge not only exposed the falsity of the Mineral Theory, but also blasted the prospects of a thriving trade. It was Liebig, however, who in spite of his mistakes brought home to Agriculturists the need they had for the help that science could give, and how Chemistry would be able to help them a great deal; and the year 1840 will always be remembered by Agriculturists as an important one, for in this year Liebig's great work was published. "If a person were asked," says Dr. Lawes, "what events had produced the greatest influence on Agriculture in Great Britain during the last half century, he would, undoubtedly, say the establishment of the Royal Agricultural Society of England, and the publication of Baron Liebig's work upon Agricultural Chemistry."

It is idle to theorize unless theory can stand the test of experiment, and it was only after Boussingault started his experiments in France on his own farm, followed by Sir John Lawes at Rothamstead in Hertfordshire, that the facts of Agricultural Chemistry began to be established. Nothing could have reached the perfection of experimentation but energy and perseverance such as Dr. Lawes possessed. He is essentially an experimentalist, and every statement he puts forward is the result of close observation and has stood the crucial test of careful experiment under his own eye in his outdoor laboratory at Rothamstead. Hence it is that we would rather listen to what he has to say, innocent as he is of any distinctions or honours gained by a laborious University course than those of any other man. It is only last month that he furnished us with an epitome of the results of his experiments which have been given in detail by Dr. Feam, the Botanist to the Royal Agricultural Society, in the volume he published not many years ago on the Rothamstead experiments. This epitome as giving information as to how crops feed is worthy the perusal and study of every Agriculturist. With regard to the much vexed question as to the inability of crops to grow continually, yet in a healthy condition, on the same land without artificial aids, we now know that this depends on the peculiar feeding habits of different families of plants in virtue of which one kind of plant affects certain ingredients of plant-food and takes these up in larger proportions to others; the extent to which roots penetrate into the ground and the capability they have for availing themselves of food in the soil. However fertile a soil, the resources of plant food as far as a particular crop is concerned are bound to be taxed to an undue extent where that crop is grown on the same land without the intervention of a crop of a different species or without artificial aids—especially in the case of agricultural crops that have their produce carried off the land in some form. Thus the peculiar feeding habits of plants—discovered by careful experiments—have explained those conditions which Theorists vainly endeavoured to account for by such hypotheses as those which the Excretory Theory and the Mineral Theory were founded on.

LIFE HISTORIES OF INSECTS INJURIOUS TO VEGETATION IN CEYLON.

By Aba.



1. *Elater Lineatus*, Linn. (Sin: Tokka, ටොක්කා.) 2. Underside of beetle showing the situation of the spine, *a*. 3. The grub or "wireworm."

THE WIREWORM.

The wireworms are the *Larvæ* of several species of a coleopterous insect *(Elater)* commonly known as the Skip Jack or Click Beetle from its power of regaining its position when laid on its back by a spring or skip, accompanied by a sharp click. The name *Tokka* by which it is known to the Sinhalese is also descriptive of this sound or click.

The leading character of this insect is a strong spine (*a* Fig. 2) situated beneath the thorax, which fits at pleasure into a small cavity on the upper part of the abdomen. It is by means of this that the beetle is enabled to spring up with great force and agility and regain its natural position when laid on its back.

Wireworms are so called on account of their likeness in toughness and shape to a piece of wire. They are very smooth and shining and somewhat cylindrical, and perhaps resemble bits of wire that have been compressed, more than anything else. The colour is a sort of ochreous yellow, which turns into a darker tint after death. Wireworms have three pairs of legs and have also a sucker-foot below the tail.

Miss Ormerod says that "the egg from which this grub is hatched is laid either in the earth close to the root of a plant, or between the sheathing-leaves near the base of the stem. On being hatched the grub or 'wireworm' eats into the stem just above the true root, about an inch below the surface of the ground, and sometimes eats its way up the middle of the stalk, even above the surface of the earth."

"The wireworms are said to live five years in the grub state, but the length of time probably depends on the supply of food. Where they are well fed, it is supposed that they only take about three years before changing to the pupa. But however this may be, with the exception of any temporary pause in winter (when they go down deeper and deeper into the ground as the frost increases), they feed voraciously near the surface till the time has come to turn into the chrysalis (or pupa). Then they go deep into the soil and form an earth-cell in which they change, and from which the perfect Beetle comes up through

the earth in two or three weeks, probably appearing about the first week of August; or they may pass the winter in this state, and the beetles develop from the chrysalis in the following spring."

(To be continued.)

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD. IX.

By W. A. De Silva.

Anacardiaceæ.

20. *Mangifera Indica,* L. Sin. Amba.

This is the mango tree which grows commonly in the warm parts of the island. There are several varieties of this species, and only one appears to be Indigenous, namely, M. Zeylanica known in Sinhalese as *Atamba.* This tree is seldom cultivated and grows wild, attaining very large dimensions, sometimes growing to a height of about a hundred feet, while the trunk reaches the circumference of about twenty feet. The stem is generally erect and straight with few branches and numerous twigs, the leaves being placed very near each other, and the petioles which are short having a rounded form at the place of attachment to the branch. The leaves are from eight to twelve inches long, of a dark green colour, with entire margins and of a lanceolate shape. The leaves of the indigenous variety are darker in colour than those of others. A peculiar acid principle is formed in the whole plant, particularly in the fruits and leaves. The flowers are large panicles and the fruits are in clusters, a single cluster sometimes contains no less than twenty fruits. The fruit is a drupe and in the indigenous variety is about the size of an egg. The seed is comparatively large and the fleshy portion or the mesocarp is very acid when unripe. When the fruit ripens the mesocarp softens and turns into a yellow colour. In this state it contains much sugary matter with a little of the acid property, and the mass contains much fibre.

The mesocarp of the ripe fruit is eaten; while the unripe ones are generally used for making chutneys, drying with salt, and flavouring curries. In the process of drying with salt, the fruits are first split into two and the kernel of the seed is removed, leaving the shell attached to the fleshy portion—the outer skin too being allowed to remain. After this, parallel incisions are made in the fleshy portion, powdered salt is sprinkled over, and the whole thing after being fermented for a day, is dried and put by for use. Mango thus prepared is kept without being spoilt for a long time. After the skin and stone are removed, the fruit boiled in syrup of sugar makes a fine preserve.

The wood of this tree is used for a variety of purposes, especially as planks for packages, &c., but it is not very durable, as it is easily attacked by worms.

The bark contains tan, but it is so much mixed with resinous matter and acid juice that it can't be economically extracted; still it is used for this purpose to some extent in India.

21. *Spondias Mangifera,* Willd; Sin. Embarella.

This is a tree met with in different parts of Ceylon, but not very common. The stem is round and grows to a good height with but few branches. The leaves are compound (pinnate). The fruit is green and is of the size of the mango. In taste too it is very much like the mango, but there is a peculiar flavour in it which is not very agreeable. A great deal of it is used for pickles and preserves. The outer-covering and the seed form a larger proportion of the fruit than in the mango.

The bark of the tree is used medicinally among native Medical Practitioners and is considered to be efficacious in Rheumatism.

CRUDE THEORIES REGARDING THE ORIGIN OF CERTAIN PLANTS.

By W. A. De Silva.

Under this heading I propose to deal with certain notions, still current in parts of the Island, which have been retailed to me in the villages, regarding the origin of the commonest among the food-producing plants of Ceylon. Most of these, though handed down by tradition and oft repeated, are by no means considered to be the true explanation; and I doubt whether even the most ignorant among the villagers give credit to these accounts. I should perhaps apologise therefore for electing to write on a subject of this nature, a consideration of which some would deem unprofitable. But I would urge in extenuation, firstly, that a subject of this kind would prove a not unpleasant change from those dealing with the hard scientific facts of Agriculture with which this Magazine abounds; secondly, that my paper should not prove uninteresting to those who wish to have a knowledge of all things bearing on local Agriculture, even the crudest and most antiquated notions that originated with the superstitious and ignorant tillers of the soil in the earliest times; and thirdly, that there is a certain significance about these theories which it would be interesting to trace.

To start with I will take up Paddy or the rice-producing plant, since rice is the principal food of the natives of this Island. My story relates how in the beginning of this *Kalpa* the earth was inhabited by two beings who descended to our sphere from the *Brahmaloka* (Heaven), and how they and their children had at first no difficulty in obtaining their food, as the soil itself was sweet and savory, and they ate of it gladly and thankfully. But as time went on, those qualities which made the soil palatable ceased to appear, and a growth which may be likened to an edible fungus sprung up which these early inhabitants were put to the trouble of collecting as their food; and hence, it is said, the necessity for work arose for the reason that wickedness began to appear among the members of this first earthly family, who had originally nothing but good in their hearts. And as the world grew older its inhabitants grew more wicked, and in proportion the greater was the difficulty in obtaining food. For the first growth which had merely to be collected and eaten gave place to another—a species of plant bearing naked grain—

in other words, rice, which the people were put to the additional trouble of collecting and cooking before it was fit for eating. Later on as the inhabitants grew more numerous and more wicked, the "rice" developed a covering or husk and evolved itself into paddy, thereby causing man greater trouble in having to separate the grain from the husk. But this was not the last of his troubles to the future Agriculturist, for now the paddy plant ceased to grow perennially with no help or attention on the part of man, and then came the necessity for the preparation of fields and the sowing of the grain in order to obtain the crop. This is the story of the paddy plant which as such has to my mind a charming simplicity about it. But on looking closer we will find a moral significance in it, inasmnch as it attempts to show how labour, trouble and care were the outcome of evil, and increased in proportion as the human race grew in wickedness. Again, there is as it were a scientific glimmer about the account, for it is evidently intended to indicate after a crude fashion that law of Agriculture according to which deterioration must eventually result when no attention is given to the soil, so that those qualities may be preserved upon which certain desirable effects depend.

ANIMAL PARASITES.

Another parasite of the Tæniada or Tapeworm family is the *Tænia Echinococcus* which occurs in man and the dog. In the dog it exists in the adult form as the full-grown tapeworm; and in man as the scolex, that is in the cystic form. This latter form, however, exists in other animals than man—in horses and cattle for instance. The worm itself is a small one consisting of 4 segments, one forming the head and three others the rest of the body. The eggs of the worm when taken into the alimentary canal of man gives exit to the embryo which bores its way till it occupies the position it chooses to establish itself in: here it develops from the bladder or cyst, the presence of which in man causes the disease known to medical men as "hydatids." These cysts may occur in the liver, lungs, &c. Smaller cysts may occur within a large one, which latter sometimes produces buds on its outside. Inside the bladder is found a fluid which on shaking assumes a turgid appearance. In the sediment of this fluid are found the embryo worms. In some cases a cyst when cut open is found to contain pus in which one odd hooklet or two indicate the embryo. It is needless to say that this parasite is most fatal to man. The disease is most common in Iceland, and is also known to occur pretty frequently in Victoria. Its presence in Iceland to so large an extent is explained by the close association of men and dogs, owing to the latter being so much used for sledge-drawing in the ice-bound regions of northern latitudes. The foolish habit which some persons have of kissing pet dogs cannot be sufficiently condemned when we consider that these animals lick themselves all over their bodies, and when suffering from tape-worm may carry in their muzzles the eggs of the Tænia Echinococcus which are to produce the future "hydatids."

All dogs suspected of suffering from tape-worm should be starved for twelve hours, dosed first with castor oil, and then areca-nut (dose from ½ to 2 drachms). Six or eight hours after more castor oil should be administered to remove the dead worms. The great point is that the head should be removed, for the worm will continue to grow by producing proglottides or segments. The head which is very small, appearing like a little knob at the end of a thread, should be looked for. Everything passed out should be mixed with straw and burnt. The medicine often requires to be administered once a week for two or three weeks before the desired effect is produced.

Mr. Hutcheon, C.V.S., the Government Veterinarian of Cape Colony writing on measles in the pig caused by the presence of *cysticercus cellulosus*, the Scolex of *Tænia Solium*, the adult tape-worm in man, which we were noticing in our April number, says that if salt and sulphur be given systematically, they would act as preventative remedies, attacking the tape-worm ova while they remain in the digestive organs, and before they become distributed as cysts throughout the circular tissue of the body.

With regard to measles, Prof. Cobbold recommends the removal of affected pigs from all sources of infection, and placing them in a clean sty for 6 or 8 months: at the expiration of that time all the *Cysticerci* or measles that existed in the pigs at the time of transfer will have perished, and the flesh of the animals may be then eaten with impunity.

AN ACCOUNT OF THE MATARA MARKET GARDEN.

(Communicated.)

This garden was opened in September 1887. It was not originally intended to be either a market or an Experimental Garden, but as the following short account of it will show, it has gradually developed into a combination of both.

It was started for the experimental cultivation of dholl, and about a quarter of an acre only was fenced off (with the permission of the Local Board) from the Esplanade between the Star Fort and the Police Station for the purpose.

Dholl is a sort of pea or gram which on account of its being both highly productive as a plant, and nutritious as food, was thought desirable, should be introduced as a product for general cultivation. It was no new product, for it had already been successfully cultivated in several parts of the Island, nor was it even altogether unknown as an article of food, small quantities of the imported grain being generally procurable in any large native bazaar. It was however not sufficiently common nor enough known to be as popular an item of food as it deserved. A knowledge of the case with which it can be cultivated and of the profit to be derived from it, would, it was thought, lead to its general cultivation. The only disadvantage under which it started in comparison with most chena products was the length of time that elapses between its sowing time and harvest, namely twelve months. It was not thought that this would be an insuperable objection to its extended cultivation; but experience has shown that it was a much graver

objection than was anticipated. The Sinhalese villager, whether chena cultivator or not, requires "quick returns and small profits," and to this must be attributed his failure to at once appreciate dholl at its real worth, and our consequent failure as yet to introduce its cultivation on any extensive scale. A patch of it has now thrived with very little care, for three successive years in the garden, and it is still hoped that gradually profit will overcome prejudice, and that dholl may hereafter become one of the principal garden products of the district.

Shortly after dholl was sown, it was found expedient, partly from a desire to extend the usefulness of the garden, and partly from the necessity of finding continous employment for the coolie in charge, to plant a small part of the garden with a few common vegetables. A few brinjals, bandakas and chillies were sown. These thrived so well that some common English vegetables were than tried. Lettuces, radishes and beetroot were all successfully cultivated, so that early in 1888 it became apparent that if further experimental cultivation was to be carried on, an extension of the garden was necessary. The quarter of an acre was thus extended to half an acre, and very shortly afterwards when cotton cultivation was proposed, the extent had again to be doubled.

While both Dholl and Cotton were thriving, vegetables, both native and English, continued to flourish, so much so, that early in the following year it was decided to enclose the whole of the remaining avilable space, a triangle in extent about 2 acres bounded on one side by a backwater of the river, and on the other two by the high road. A portion of this bordering the river being low swampy ground has to be raised three or four feet to be made fit for continuous cultivation. Sweepings and scavengers' collections deposited here have already reclaimed a large portion of this, and in another year it is hoped the whole extent of the garden will be available for cultivation.

The expenditure in the garden has been merely nominal, as the labour of four prisoners has almost uninterruptedly been supplied free. An orerseer at R10 a month and a garden coolie at R7·50, with the cost of seeds and tools have been the principal items of expenditure, which have been almost met by the sale of produce. The vegetables which have been found to grow best are tomatoes, lettuce, radishes and beetroot, while celery, cabbages, and carrots, though they grew fairly well, cannot be said to have been a success.

In 1889, Cotton and Dholl had both passed the experimental stage of cultivation, vegetables, both native and English, had been successfully tried, fruit trees had been kindly presented by the Director of the Royal Botanic Gardens at Peradeniya, and all that appeared necessary was to make the garden more attractive to visitors. This was attempted by the introduction of English flowers. Some of these, notably Zinias, Balsams, and Mignonette were grown most successfully, and the garden is now almost continually gaily coloured with rows of flowers edging each walk.

During the present year it has been found necessary to employ an additional coolie, and the growing importance of the garden has shown that it will shortly be necessary to appoint some superior officer to take charge of the whole. With this view, a gardener's cottage in place of the miserable shanty in which the coolie has hitherto lived, is now being built. It is a substantial building of stone, and will, it is hoped be in time, in trimness and picturesqueness the very model of what a gardener's cottage should be.

With a garden already in a flourishing condition, and a gardener's house provided, it is hoped that ere long the Director of the Royal Botanic Gardens may be able to extend his sphere of usefulness in lowcountry cultivation by taking over this as a Government Garden, or by securing for it some small portion of the Government Grant voted for Botanical and Experimental Gardens in the Island generally. Out of five gardens now in his charge, there appear to be only two in the lowcountry, namely at Anuradhapura and Henaratgoda, so that it is not much to ask that the mere pay of a gardener for another lowcountry garden, and that in a district noted for its fertility, should be granted. The Head Gardener's attention and power to do good would not be confined to this garden alone; there are in the district four other gardens, at present in the charge of Mudaliyars or some subordinate headmen, in which cotton and dholl are still being tried, and which with occasional visits from a qualified gardener could be vastly improved.

A combination of this enterprise with that of Poultry farming would not seem impracticable, and if a suitable man can be found for the post, it is proposed to construct a spacious poultry yard, enclosed by wire netting, at the back of the gardener's cottage. In both schemes there is no doubt room for profit as well as philanthropy.

NOTES FROM A TRAVELLER'S DIARY.

I profoundly regret that I was unable to send my instalment of notes for the June number, and that my promise in my May notes should have so soon illustrated the proverbial untruthfulness of Travellers. The fact is that I was much engaged last month at Nikaweratiya, and when I found leisure at Wariyapola, I also found that I was too late for the June issue, and that the Magazine must have already been in the hands of the printer.

I find that the weeding of paddy-land in the Kandyan Districts, is confined only to certain areas. It seems to be nowhere carried on in the Province of Uva, and but to a limited extent in the Central Province. But I have never seen weeding more carefully done than in Kadugannawa District.

At Tulpegoda, a village in Lower Hewaheta, about twelve miles distant from Kandy, I was shown a liedda of paddy in the midst of a large tract of paddy-land, where the difference in the plants from those in the surrounding fields was quite striking. The plants in this liedda were hardy and erect, and the ears on them were well set with plump grain. The explanation given me by the owner was that these plants had been transplanted into their present situation. This owner seemed quite proud of his successful experiment which he intends repeating on a larger scale.

I find that Saltpetre (Potassium Nitrate) is prepared from the dung of bats in some parts of the island. The process as explained to me is very simple. The dung is dissolved in water with some clay obtained from ant-hills, and the mixture is strained; after which the liquid is boiled and left to cool, when the saltpetre separates out in crystals. This is how the natives obtained their saltpetre in past times for the preparation of gunpowder.

A good many coffee lands which one time brought wealth to their owners are now thick lantana jungles, and the habitat of the wild boar and jackal. When coffee was king they say that gambling and drinking were far more common than they are now in the Kandyan villages: and an amusing story was retailed to me of these times which, apocryphal as it may seem, I was assured is a true one.

It seems that two Kandyan coffee landowners were at a loss how to dispose of the superfluous rupees which they possessed, and the novelty of the situation suggested to them an equally novel mode of relieving themselves of their useless cash, while at the same time it was intended to impress the world with an idea of the abundance of their possessions. These illustrious Agriculturists sought the interior of a hotel (which alas was a too common *rendezvous* for successful coffee planters), and after a sumptuous repast produced Manilla cigars—wrapped in silver foil? No, but in genuine "ten rupee notes." They could not, however, have been educated smokers, for they smoked their cigars with the foil round them, and even drew the attention of those present to the strange proceeding! Is there a better illustration of the height of smallmindedness? Doubtless, these two gentlemen, who I am assured are still alive, eking out an existance on a bit of paddy land, have by this learned the art of economy and —smoking!

Cotton cultivation is carried on to a large extent in Dumbara and Matale Districts by both Europeans and Natives. Lower Dumbara is well known for its rich soil, and a good deal of tobacco is also grown there. Several varieties of cotton have been planted, such as Sea Island, Kidney, New Orleans and Egyptian. Hunuketale plantation, belonging to the Spinning and Weaving Company, is also in the Matale District. The estate is 120 acres in extent, and represents several varieties of cotton. Egyptian has, however, been found best suited to the district, and there are 40 acres fully planted with this variety which grows freely and bears profusely. Two crops are obtained: the plants being pruned after the first crop, and pulled up after the second. Kidney cotton also grows well, but its yield is not so good as the Egyptian. New Orleans does not seem to do very well in these parts. Sea Island succeeds better in Dumbara owing to its humid climate, the dry climate of Matale favouring Egyptian. The seeds of Sea Island is said to deteriorate in Dumbara, perhaps, owing to the want of sufficient saline matter in the soil. Planting and pruning at the proper time seem to be the secrets of successful cultivation.

OCCASIONAL NOTES.

Mr. J. P. Lewis, in his Administration Report of the Vavuniyanvilankulam District, writes of cotton:—"Some Fiji or Kidney, and New Orleans cotton was received, and was distributed to the headmen to be sown. The results of the experiment as regards the former variety were unfavourable, a large proportion of the seed not having come up, but the New Orleans variety of cotton seems likely to do well." Mr. M. S. Crawford, in his report on the Mannar District, says of cotton:—"Several lots of cotton seed were distributed and sown, but failed from want of rain. The soil of the district is admirably suited to the growth of cotton, and considerable quantities of the native variety are grown in the island, where it is used for the manufacture of nets. No new areas of cultivation were opened during the year."

Cattle disease seems to have caused much loss during the past year in the Mannar District. It is reported that cattle suffered much from a disease called *Kaliccal* (purging), and large numbers, particularly buffaloes, died. The disease is supposed to have been introduced from India. No remedies were tried. On this subject Mr. Lewis reports from the Mullaittivu District that the total number of deaths during the year 1889 were 266 buffaloes and 107 neat cattle. During the visitation of the epidemic over 40 per cent of the cattle of the district were carried off by it.

The following extract regarding the introduction of new varieties of cotton into the island, is from the Administration Report for 1889 of the Government Agent of the Western Province:—

COTTON.—An attempt has been made to introduce cotton cultivation, and, as in the case of Liberian coffee and other products, the special patronage of Government has been invoked to assist it.

If the Government or the promoters would pay the cost of all the experiments, I think the attempt to introduce it would be very laudable; but so far as I can judge what is done is this:—The native land-owner is assured by the Government Agent or the Assistant Government Agent that cotton cultivation is a most remunerative speculation, and he is induced to clear and prepare his land. This he does at some considerable cost, which he himself has to bear. He is then furnished with imported seed, which he is told is of a very excellent variety imported at great expense. Unfortunately, such seed has hitherto generally turned out to be very bad, and often utterly unsuited to the climate. Only about ten per cent. grows and produces a crop. This has to be watched and protected from rats and other enemies at some cost, and when the cotton is picked it is taken over by the persons who provided the seed, and paid for at a rate which could not possibly repay the producer even if he had a most magnificent crop, but which under all the circumstances leaves him a certain and considerable loser. If he complains, he will probably be told that everyone regrets that the description of seed supplied to him has been found not to be that best suited to the Colony, and he is advised to try a different variety which has just arrived, and is sure to be successful, and will be given to him remarkably cheap.

In my opinion, as I have already reported, the country kapok is the best suited for the country. It will grow well almost anywhere, and if the cotton when picked is well paid for, the industry will soon extend.

It would, I think, be good policy for the promoters of the Spinning and Weaving Company to pay three or four times the value of cotton at first, in order to stimulate its cultivation. Fist attempts to grow a commodity are always the most expensive. When the cultivation is well established, the cost of production will be reduced, and the ordinary laws of supply and demand will soon operate.

If the Government wish to assist the cultivation of this or of any other variety of cotton, a fairly large grant should be made to introduce it thoroughly and in earnest into some such districts as the Bintenna or the Kolonna and Meda Korales in Sabaragamuwa, but such attempts as have hitherto been made will, in my humble opinion, always fail, and do more to check than extend the cultivation of a product which, I believe, if once established would be of special benefit to the Island.

This complaint of bad seed comes from most parts of the Island, and it is a pity some trials were not previously made to test the value of the seed before distributing it to the villagers, who having once formed a bad opinion, will not easily be made to change it. Now that reports come from Germany that a sugar fifteen times sweeter than that from the cane, and twenty times sweeter than that from beet, can be extracted from cotton seed, there is all the more reason to encourage the extention of cotton-cultivation.

The visit of Mr. Lipton to Ceylon will be remembered for the great push that will be given to the trade in Ceylon tea. "The great tea-man" as he is now called has invested many thousands of pounds in tea-estates in the Island, the produce of which will be almost literally sown broadcast over a large fraction of the earth's surface. All who have lived any time in Ediuboro' or Glasgow will be familiar with "Lipton's," where one got the best value for his money, and where business was carried on on the strictest principles. Saturday night at Lipton's used to be a great day for the poorer classes who flocked in crowds to avail themselves of the opportunity to get their groceries at reduced prices; and Lipton's monster cheese will not be forgotten in a hurry by the many who congregated at his windows in North Bridge Street to see, and read the particulars of the manufacture of, the cheese which Her Majesty was obliged to gracefully decline.

It is more than surprising that no one has started the idea of establishing dyeing and cleaning works in Ceylon, considering the extent to which such a business is certain to be patronised. What a saving in clothes there would be! If cleaning and re-dyeing of clothes be considered necessary in the West, how much greater is the need for such operations in the East, where the dust and heat do so much to soil dress material and cause it to fade. Dark clothes which have become dusty and faded, in half the time they do in a less trying climate, to a degree beyond remedy by the ordinary household methods, if sent to such an establishment as Puller's and subjected to certain chemical processes, will return with the cleanliness, freshness and original gloss of a new article. What an advantage this would be to those whose means are limited! It is high time that cleaning, dyeing, and even bleaching works were established in a growing city like Colombo.

The cultivation of new varieties of Potatoes has been attempted in Nuwara Eliya. In the case of Aberdeen Kidneys, with 56 lbs. of seed a crop of 510 lbs. was got. Mr. Le Mesurier, Government Agent, had a good return with Tasmanian seed, and is of opinion that potatoes can be grown to perfection in Nuwara Eliya. The question suggests itself as to who first attempted the growth of potatoes in Ceylon. We remember reading in a local newspaper some years ago that Mr. Lorenz, the father of Mr. Advocate C. A. Lorenz, was the first to experiment in potato growing when in Matara. It would be interesting to know the details of these experiments.

GENERAL ITEMS.

Dr. James Clarke, M. A., PH. D., lately attached to the British Museum, has been appointed Professor of Natural History in the Downton College of Agriculture. Downton bids fair to be the leading College of Agriculture in England, to judge from the successes its students are gaining at the public competitive examinations in Agricultural Science.

The copyright of the well-known series of "Hand-books of the Farm" which are acknowledged to be the most valuable collection of text-books on the various branches of Agriculture, brought out under the superintendence of the late John Chalmers Morton, has been purchased by Messrs. Vinton & Co., the Agricultural and Sporting publishers of New Bridge Street, London.

The appointment of Agricultural Instructors is not peculiar to Ceylon. A Government Commission instituted to inquire into the condition of Agriculture in the Netherlands, and to suggest the best means of improving it, advise the appointment of "special government officials to be called Agricultural Instructors."

The number of applications for protection of Agricultural inventions in Great Britain amounted for the year 1889 to 21,000.

Professor Brown writing of Influenza in horses, says that good nursing, the administration of small doses of salines—as sulphate of magnesia—occasional employment of stimulating liniments to the throat and chest, and, in the convalescent stage, liberal rations, with tonics, constitute the favourite and successful system of treatment of influenza. Bleeding, purging and blistering, he says, which are the sheet anchors of the medicine man of the old school, are means which, in this disease, only tend to increase the prostration, and defeat the restorative efforts of Nature.

The latest report on the prospects of the Indian wheat crop for the season 1889-90, states that the failure of the winter rains has told severely on

the unirrigated wheat crop of the Punjab and the North-Western Provinces and Oudh, and an indifferent harvest must be looked for in about one-half the total area sown in the two provinces. In Bengal conditions are better than last year as regards both area and outturn. In the Central Provinces an average crop on an average area will probably be secured. In Berar a smaller area than usual has to be sown, and the outturn as reported will be poor. In the Bombay Presidency there is a considerable decrease in area ; the Deccan crop will be a short one, but a fair harvest is anticipated in Gujarat and the Caranatic. In Sindh a larger area than usual has been put under wheat, and prospects are favourable.

Fruit-evaporation is carried on to an enormous extent in America, especially in New York State and California. The fruits evaporated are principally apples, but nearly every fruit is utilized. The value of evaporated fruit from California alone amounted in 1888 to nearly half a million pounds sterling. It takes 8 lb. of fresh fruit to make 1 lb. of evaporated apples. We get an idea of the work entailed in the operation of fruit drying and the scale on which it is carried out by the following particulars regarding New York State:—In 1888, 250 million lbs. of green apples and 50 thousand quarts of raspberries were operated upon, which produced about 40 thousand lbs. of evaporated fruit, valued at nearly 30 thousand pounds sterling. During the operation 19 thousand tons of coal were burnt in 1,500 drying-houses, and 45,000 hands were employed.

Babu Atal Krishna Ray, a graduate of Cirencester, has published a small work on the improvement of cattle in India. The evils caused by neglecting the principles of breeding and good feeding are, he says, so great in India, that they are almost beyond remedy.

The Agricultural Journal of Cape Colony of the 10th April contains much information under the headings of cultivation of sugar sorghum for manufacture of sugar in Cape Colony, steeping of grain in bluestone solution, measles in pig, cheese-making, phylloxera, cultivation of vines of pleuro-pneumonia, agricultural prospects, &c.

The results of experiments to test the value of woodshavings as litter for cattle have been published. They are recommended for softness, dryness and cleanliness; while with regard to manurial value, they contain more nitrogen and phosphoric acid though less potash than straw.

Dr. Weismann states that the horse and bear attain an age of 50 years at the outside ; the lion lives about 35 years, the wildboar 25, the sheep 15, the fox 14, the hare 10, the squirrel and mouse 6 years. On the other hand, whales live for some hundreds of years, and elephants for 200 years. The shortest life is found in the imagos of certain mayflies which only live four or five hours.

Horse-shoeing even in England is considered to be in a very backward state. A writer in the Royal Agricultural Society's Journal says that farriers as a body are sadly ignorant of the essential principles of their art, and valuable horses are often liable to be injured in consequence. The Worshipful Company of Farriers of London have just formulated an important national scheme for the improvement of farriery by the examination and registration of shoeing smiths, an example that might well be imitated.

The sweet potato (convolvulus batata) is a great staple in Natal, being much valued for its agreeable and nutritive qualities as food, growing luxuriantly everywhere, especially on light sandy soils. There is nothing better for livestock of all kinds than this useful root.

We have to thank Mr. Van Starrex, of Crystal Hill, Matale, for seeds of Anatto, Croton-oil plant, and the Musk plant. Our thanks are also due to Mr. H. D. Lewis, sub-inspector of schools, for seeds of Sun hemp and Cuttack paddy.

We acknowledge with thanks the receipt of the St. Thomas' College Magazine for May.

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TEA CHESTS.

THE complaint made by more than one of the most prominent among the London tea brokers, to the effect that recent arrivals of Ceylon tea had been greatly injured by having been packed in boxes made of unseasoned wood, is one of particular gravity. It is one, indeed, to which the most serious attention of our planters should be directetd: for it its cause be not removed it is likely to have a very injurious effect upon the reputation which our staple produce has now acquired.

For some years past the difficulty of obtaining in sufficient quantity thoroughly seasoned and otherwise adapted wood for the manufacture of tea chests has been generally acknowledged With the extension of tea cultivation this difficulty is certain to increase, and equally certain is it—if only to judge by the complaints to which we have drawn attention—that even with the present demand it has not at this date been fully met and overcome. The question we may well ask ourselves is, whether there is any present prospect of a greater measure of success being attained in this direction? Many localities, both in and out of the island, have been searched in the hope of finding some solution of the difficulty, but hitherto these can scarcely be said to have afforded full satisfaction, except, perhaps, in the supplies from Japan. To be told that some of our teas reach London so impregnated with a "cheesy" flavour that they have to be turned out, thoroughly aired, and re-packed in fresh chests, is a most unpleasant revelation. We are all aware how our delicate teas must suffer from being submitted to such an operation, and we cannot fail to realize how injurious to their high repute must be its consequences. Very recently, when referring to the Stanley-Wrightson chests, our London Correspondent informed us of a prospect that the strawboard of which these are made might ultimately be prepared from horse manure. Thereupon Mr. Creasy, in a letter which appeared in our columns, indulged in a plenitude of "epitaphs"—to plagiarize Mrs. Malaprop—in condemnation of such use; but we doubt much whether, even if that gentleman's anticipations of evil and tainting smells to be expected from the use of a material so produced be realized, these could be worse than those due to the exudation of acids from unseasoned wood. In the latter case, it is not bad aroma alone that has to be feared, but the action of these acids upon the lead which is supposed to exclude the tea from the tainting effect of it.

It seems to be certain, that, if those who have endeavoured to serve our island interests in this matter of tea chests, from local resources, fail so far in their object as to leave it open for coumplaints of the nature stated to be made,—our planters will have to turn their thoughts to some substitute for wood. We hesitate to say as yet how far the new chests supplied by the Stanley-Wrightson Syndicate may be found fitted to take the place of the wooden ones at present used. These chests are as yet upon their trial, and so far the trial is only in its incipien stage. A few months, probably, will either reveal their superiority or condemn them as furnishing an alternative for escape from our present difficulty. Trial shipments have already reached the island, and our London Letter informs us that the manufactures are delaying the further development of their present limited means for the production of the chests until the verdict of tea planters and shippers and of the home tea trade should be fully given. It is but natural that we ourselves, being informed of this hesitation on the part of the Syndicate, should refrain from expressing any opinion with regard to the merits of this invention as affording a solution to this importan question.

But there is one aspect in which we might well desire to express the hope that these Stanley-Wright

son chests may prove to be all that is claimed for them, quite apart from that in which our planters may regard the matter. Should it ultimately be found desirable to supersede the wooden boxes at present in use by this novel alternative, the decision may open to us another very valuable island industry, and much money which now goes out of Ceylon to pay for foreign woods and Japanese boxes may be retained in it to the great benefit of its community. It is known that the Syndicate working the patent for these chests looks forward hopefully to eventually conducting their manufacture locally. Ceylon, as does every other tropical country, possesses an abundance of almost wild growth which by means of modern machinery may readily be prepared for the production of this strawboard. We have before dealt with the prospect which is thus held out to us, and we need not therefore here further dilate upon it. But the complaint now reaching us brings this prospect nearer to us. It may be found that in its realization may lie the only road out of the difficulties which have given rise to that complaint. We would therefore express the hope that those of our friends who may now be making trial of the Stanley-Wrightson chests will favour us with as early information as to the results to their experience with them as may be practicable. We cannot fail to appreciate any new device by which the causes for the complaints we have dealt with may soon be removed. We shall deal with the good news of the successful utilisation of Maana grass reported by this mail, on another page.

THE PLANTING INDUSTRY OF THE COLONY (CEYLON) IN JUNE 1890.

The main results can now be given of the compilation of plantation statistics for our "Handbook and Directory," thus:—

Number of separate properties recorded	..1,930
Number of plantations cultivated ..	..1,452
Number of Superintendents and Assistants	..1,211

Total extent ..	..686,728	acres.
„ cultivated ..	..324,765	„
In Tea	..219,487	„
„ Coffee (Arabian)	.. 53,454	„
„ „ (Liberian)	.. 1,226	„
„ Cacao ..	.. 12,050	„
„ Cardamoms ..	.. 5,060	„
„ Cotton (on plantations)..	293	„
„ Tobacco „ ..	477	„
„ Rubber „ ..	678	„
„ Pepper „ ..	215	„
„ Arnatto „ ..	419	„
„ Timber and fuel trees planted	1,589	„

In Cinchona,—19,677,000 trees over two years old.

This last piece of information may appear rather startling to those who have been crying out that there is no cinchona left in the country; but the figures really mean that 16 millions of cinchona trees have been cut down and uprooted since July 1888—no bad rate of harvesting. We have already dealt with tea. Poor old coffee has run out by 25,000 acres in the two years and what a change since 1877—thirteen years ago only—when coffee stood for 272,243 acres! Liberian coffee and cacao show little change; but the area under cardamoms has slightly increased. Of the minor products, there is no need that we should speak today. But it is interesting to note that while the total number of plantations cultivated has not increased (a number of old places "abandoned"), but is rather less, the total number of planters has gone up from 1,136 to 1,211 in the two years. Our highest number was 1,389 in February 1881, and then it went down to 1,079 in December 1885. In rather more than four years therefore, we have gained 132 additions to the list of managers and assistant superintendents or at the rate of 34 per annum.

IMMIGRANT AND NATIVE LABOUR IN JAMAICA.

The negroes and their friends in Jamaica have generally opposed immigration at the cost of the State on the ground that native labour is abundant and would be available for the planters if they gave equal wages and advantages to natives as to immigrants. The complaint of employers in Jamaica is in regard to negroes the same as in Ceylon is preferred against the Sinhalese,—unreliability: the absence of steady perseverance in work. The report of a recent committee on immigration seems to have dealt very fully with the whole question, as the following extracts prove:—

That they have duly considered the Messages of His Excellency the Governor and the several Petitions relating to Immigration and have heard all witnesses who have tendered their evidence on the subject.

They accept the statement that in many Districts of the Island there is an absence of that supply of continuous and reliable labour which is indispensable to secure the investment of capital and the development of the great resources of the Island.

Your Committee are of opinion that for the encouragement of the investment of capital on agricultural operations, a certainty of continuous labor is a necessity, and that in a country so sparsely populated as this is the establishment of a system by which such labour can be secured on fair terms to the employer and employed must work greatly to general prosperity. They attach considerable importance to the assertion of those who oppose Immigration that if the same facilities, terms and advantages now given to imported labourers are given to native labourers, the uncertainty now attending the supply of labour would be lessened. They therefore recommend that power should be granted to the Protector of Immigrants to enter into contracts with native labourers on behalf of employers and that only a sufficient number of imported labourers should be introduced as will with the native contract labourers meet the wants of employers. To encourage the native labourer to work under the protection of the Immigration Department your Committee recommend that an indenture fee of 50s a year for each native adult labourer entering into an annual contract should be paid to the Executive by each employer and that of this sum £2 should be paid as a bonus to the native labourer on the expiry of each year's faithful service under contract, and the remaining 10s should be available to yards reimbursing the Government the cost of carrying out the system. This would give the native contract labourer an advantage over any imported labourer.

They further recommend that no employer should be supplied with imported labourers who refuses to receive such contract labourers (native or second term Coolies) as the Protector is able to allot to him, or who after receiving, breaks his contract to them.

Your Committee are of opinion that as priority of employment would, under the system they recommend, always be given to native labourers who are willing to work under annual contracts which the Government would be responsible to see duly carried out as well by the labourer as by the employer, the public interest requires that any deficiency in the supply of labour necessary for the continuance or development of agricultural operation should be met by importing a sufficient number of labourers from elsewhere.

It must be borne in mind that if by the arrangement suggested there be a sufficiency of native labourers, willing to work under Government Supervision on yearly contracts—so as to ensure to capital a reliable supply of labour—no imported labourers will be required or introduced and that if enterprise and capital are driven away from Jamaica, because neither native nor imported labour is obtainable, it will be not only impossible for the Colony to advance but on the contrary it will retrograde.

Your Committee do not think there is any question of competition between the native and imported labourer because they cannot believe that an employer will ever resort to the employment of imported labourers if he can obtain reliable native labour.

Your Committee in closing their Report call attention to the fact that if it be, as maintained by many a ainst the assertion of others, that there is a sufficiency of native labour, and if that labour will declare it elf and avail itself of the machinery afforded by these suggestions general prosperity will be secured at no cost to the State beyond the maintenance of the Immigration Department for the benefit of native labourers.

One member of the committee in a separate statement said :—

Individually, I go beyond its recommendations and would urge upon the Government the necessity for taking immediate steps to meet the demand for labour not only on Estates—which now exists—but the demand which, in my opinion is certain to arise in carrying out the very extensive public works already decided on, and in contemplation and which must to a great extent deplete the present supply of agricultural labour. I also think that the Government ought to offer inducements to skilled laborers and tradesmen to settle in the Island who could teach their handicrafts (now nearly extinct) to the rising generation under a proper system of apprenticeship.

In my opinion it is idle to assert that native labour is now available on the terms given to the Coolie immigrant. Employers cannot expect to control continuous native labour—even on ruinous terms—while the labourer can become a freeholder with a facility unsurpassed anywhere and there are other well known reasons which account for the decreasing supply of labour, notably, the smattering of elementary education given to our youth, which has the tendency in the present transitional condition of the bulk of the population to disqualify them for field or other manual work.

DOMESTIC GEMS AND PRECIOUS STONES.

The following is from the New York *Sun* : "While it is a fact that nearly all the precious stones are to be found in the United States, the deposit of most of the varieties, so far as we know, are too meagre to warrant the application of capital and systematic labor to their production. In two States only, Maine and North Carolina, has a systematic search for gems been carried on. Of diamonds, for instance, 95 per cent. of the current supply comes from the Kimberly mines of South Africa. Over nine tons of diamonds, valued after cutting at $500,000,000, have been taken from those mines since their discovery in 1867. The South African mines are all contained within a radius of a mile and a half. The deposit is concentrated and its working profitable. Since Brazil, India and Borneo are to be included among the contributors of the remaing 5 per cent. of the world's diamond supply, it will be seen that the share of the United States as a producer is hardly recognizable. A few years ago a very lively hope was started of the existence of diamond fields in Kentucky. It was based upon a striking resemblance between certain earthy formations in Kentucky and those at the Kimberly mines. Theoretically, there is strong reason to believe in a Kentucky diamond bed, but the theory has not yet developed into fact. Less reason but a more brilliant plausibility was given to the promise of a diamond mine in Arizona some twenty years ago. Representations were made in San Francisco of the discovery of an immense treasure of diamonds and rubies in one of the neighboring territories. In confirmation there were exhibited so called rubies amounting to 80,000 carats, and numerous diamonds, one of 108 carats weight. The stones were deposited in the Bank of California, and the news spread across the continent. Capitalists became interested. A bill in the interest of diamond miners was passed in Congress. A great combination party from the east and from the west went prospecting. They carried along an expert from the Royal School of Mines, in Freiburg. They found the promised spot. Everybody picked up gems. In a week the party secured 1,000 carats of diamonds and something like 7,000 carats of rubies. Then Mr. Clarence King, director of the United States Geological Survey, went out and proved that the mine had been 'salted.' The rubies were shown to be ordinary garnets, and the 108-carat diamond a piece of quartz. Part of the salting had been done with a large quantity of rough diamonds bought by an unnamed American in London. The swindlers made by their venture $750,000, the greater part of which was contributed by California capitalists. Of corundum, the mineral which, in some of its varieties, bears the names ruby, sapphire, Oriental amethyst, Oriental emerald and Oriental topaz, we have some specimens, but the country is not rich in stones of this order. The North Carolina corundum excels in variety of color. Many specimens have been cut and mounted, especially of the blue and red shades, and make good gems, though not of the choicer quality. The chief locality for gem sapphires in the United States is near Helena, Mont., where they occur as loose crystals, usually small but often transparent and of good colour. Turquoise we get from New Mexico, Arizona, Nevada, Colorado and California."—*Bradstreet's*, 10th May.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.G.S., F.L.S., &C.,

Editor of *Science Gossip*.

SUGAR-CANE.—A most interesting and highly important paper was read before the Linnean Society in March by Mr. D. Morris. Mr. Morris is one of the younger school of botanists, and is well-known for his extensive knowledge of economic botany, for which his training in Jamaica has well fitted him. He is now assistant director at Kew, and it is there he has made the discovery announced in the paper above referred to. It is concerning the growth and development of the sugar-cane. Hitherto the plan has been to propagate it by slips or cuttings and few planters knew or cared anything about the seeds. Mr. Morris had succeeded in obtaining seeds from the sugar-cane, and he believes he can

raise from them a great variety of improved canes. He showed by cross-fertilisation and artificial selection of the best seeds a richer sugar-yielding cane might be produced for growth in tropical plantations.—*Australasian.*

COFFEE AND COCOA TRADES SECTION:—LONDON CHAMBER OF COMMERCE.

The annual meeting of the members of the Coffee and Cocoa Trades Section of the London Chamber of Commerce was held on Monday afternoon at the offices, Botolph House, Eastcheap, E.C., Mr. Robert Wales presiding.

The Coffee Committee was re-elected, with Mr. Game in place of Mr. Larner, deceased, and Mr. H. Flower (of Messrs. J. Cook & Co.) in place of Mr. Major, also deceased. The Cocoa Committee remained as before, and the president and vice-president of the Section were also re-elected.

Mr. RUCKER then brought forward the question of the liability of fire insurance offices to the merchant and thence to the broker, who may have advanced money on the sale previous to prompt, and it was decided to fully discuss the matter at a future meeting, notice of which should be given.

It was further decided to accept the offer made on the part of Mr. Pasteur of a paper on the interesting subject of "Coffee Cultivation in Bechuanaland and Natal." It was stated that the paper would be read about the middle of June, on a date to be selected by Mr. Pasteur himself.

This concluding the business, a vote of thanks to the Chairman was carried, on the motion of Mr. W. W. ASSER, seconded by Mr. E. A. RUCKER.—*Grocer,* May 24th.

HOW PERFUMES ARE MADE.

Those dainty, delicate perfumes which the superfine and the vulgar alike enjoy are obtained in a very prosaic way. They are produced in a land where the flowers are perennial, but the processes of manufacture include not only distillation and fermentation, but even boiling in fat. Consul Harris, writing from Nice, where the manufacture is carried on extensively, describes the processes. In distillation the flowers are boiled in an hermetically-sealed copper vessel. The steam as it condenses in its passage through a spiral coil exudes the volatile essence drop by drop, and it is collected in a small glass vessel. The water in the copper retains a small portion of the scent and becomes the rose water or orange flower water of trade. All flowers are not susceptible of this treatment, and those that are produce but a minute quantity, the orange flower, for instance, giving but one gramme of essence for one kilo. of flowers, or but one-thousandth part. The following table will show the proportionate yield of the different flowers:—

Neroli	1,000 kilos.	of flowers	1 kilo.	of essence
Rose	25,000	do	1	do
Geranium	1,000	do	1	do
Mint	1,000	do	0.750	do
Orange leaf (bitter)	1,000	do	1	do
Lavender	100	do	0.500	do
Eucalyptus	100	do	0.500	do

The volatile essences thus obtained, combined and mixed together with a certain quantity of alcohol, are used in the preparation and as the basis of eau de Cologne, toilet vinegar, lavender water, &c.

The perfume from flowers which do not contain the volatile essence is extracted by two processes. In the first or cold process, cassie, jessamine, jonquils, tuberoses, violets, and some other flowers, freshly gathered, are placed upon a layer of pure lard, a quarter of an inch in thickness, spread over glass trays. The flowers are changed every twelve, eighteen, or twenty-four hours, according to circumstances, until the lard is sufficiently charged with perfume. Jessamine and tuberose are changed as often as fifty times, and the other flowers from twenty to thirty times. When the hot process is resorted to grease is placed in a copper vessel, together with the flowers, and the compound is boiled. Additional flowers are added from time to time until the fat has absorbed the requisite amount of perfume. By another process the perfumes are extracted from the fats, and, by blending these with the different essences, the numerous scents are obtained. Certain perfumes which are of great use in the manufacture of scents can only be obtained by the fermentation of fruits, flowers, and roots.—*P. M. Budget.*

A RAILWAY FOR EAST AFRICA.

Lieutenant Weiss, who, together with the late Dr. Juhlke, explored the country from Pangani to Mount Kilimanjaro in 1885, discusses in the German *Colonial Gazette* a scheme for laying a railway in East Africa from the coast to the neighbourhood of that mountain. He points out that Usambara is very fertile and healthy, so that the construction of a railway there would be a splendid factor in the development of German East Africa. The line as proposed would start from the German station of Tanga, and touch at the following stations:—Amboni, a plantation of the German Planters' Company; Umba, an English mission station on the Ubumbine, a tributary of the Mkulmusi, which flows into Tanga Bay; and Mtangate, 4½ miles from the great English mission station of Magila. The line will then pass to the south of Lewa, the great tobacco plantation of the East African Planters Company, and will strike the Valley of the River Pangani, where it is 476 feet above the sea level. Korogwa (951 feet), a deserted station of the East African Company, and Masinde (1,679 feet), the residence of Limbodja, the chief of Usambara, will be touched, and the line will then be continued to the west along the Pare and Ugueno Mountains to Aruscha (2,421 feet), at the foot of Kilimanjaro. The total length of the line from Tanga to Aruscha is given as 223 miles. Lieutenant Weiss estimates the cost of building such a railway at 500,000*l.*,* and the yearly working expenses at about 56,000*l.* He asserts that the country at the foot of Kilimanjaro is so salubrious, in consequence of its altitude, that German peasants could settle there. He recommends also that a sanatorium should be built there for those Germans stationed on the coast who may suffer from fever.—*O. Mail,* May 30th.

* Absurd: the sum may be multiplied by 4.—ED. *T. A.*

THE BURMA RUBY MINES.

The following memorandum, drawn up by Sir Lepel Griffin, the Chairman of the Ruby Mines Company, on his return from visiting the mines, has been issued:—

At the request of the Board of Directors of the Burma Ruby mines, and some of the largest shareholders, I visited the mines at Mogok in March last in order to ascertain what were the prospects of the undertaking, the difficulties to be overcome, and to settle any important questions which might be under discussion between the Company and the Local Government.

I have returned within the last few days, and having spent a sufficient time at the head-quarters of the Company—Kyatpyin and Mogok—to make myself thoroughly acquainted with the state of affairs, pending the calling of a general meeting, the board consider that it is desirable to circulate a brief memorandum to inform shareholders of the existing position, and what and how near are the prospects of success. I may say at once that I have returned with a firm

conviction that the eventual prospects of the Company are exceedingly good. There is no doubt that rubies are being found in large quantities by the native miners who have an hereditary right to work under certain conditions.

The reason that rubies of high value and in large quantities have not yet been obtained by the Company are two :—the non-arrival of the machinery required to develop the mines, and the wholesale smuggling of stones in defiance of the regulations under which the Company have the right of purchase of all stones found by the native miners.

Mogok is situated in a mountain region covered with dense forests, approached by 65 miles of exceedingly difficult country, over which a road has only been completed for a few months. Even now this road is unmetalled and only suitable for fair weather traffic.

It has been almost impossible to convey heavy machinery to the mines, and scarcely anything at the time of my visit had reached there in a complete and working condition. This state of things is being rapidly improved. Large quantities of machinery had arrived at Thabetyin, the terminus on the river, and at Khabine, midway between the river and Mogok, and were being pushed forward with all speed. It is a matter of regret that the arrival of the machinery has been so long delayed, but it has depended on physical considerations beyond the Company's control.

The second reason for the failure of the Company to obtain rubies from the natives was the universal and practically unchecked system of smuggling. The native miners were bound to produce their stones and dispose of them to the Company at a reduction of 30 per cent on their declared value. Smuggling was however so easy that the effect of this tax, which formed one of the rules framed by the Government under which the lease was taken by the Company, was that miners brought in no valuable stones for sale to the Company's agents; all such were smuggled and sent down country for disposal at Mandalay, Rangoon or Calcutta, and it is asserted that 20 lakhs of rupees' worth of rubies are annually disposed of in the town of Mandalay alone. These inefficient rules, which were absolutely inoperative to prevent smuggling, and which only caused loss to the Company instead of benefit, I have with the full concurrence of the Local Government and with the approval of all officers acquainted with the situation, abolished, largely increasing the tax which individual miners pay to the Company. The sale of rubies found by the native miners is now free, and it is expected that they will bring a large proportion of the best stones to the Company's agents for purchase.

It is estimated that the tax paid by them, will commence at the rate of R100,000 per annum, rise to R140,000 when the full complement of miners is employed, and may hereafter largely increase by the general raising of the tax. This system will, it is hoped, give the Company an assured and increasing income, and also secure to them a large proportion of the most valuable stones found.

Great progress has been made in the erection of houses for the staff and officers, and workshops, and the machinery is being erected as it arrives in suitable places, especially at Kyatpyin, which is the engineering head-quarters. The river which runs through the Mogok valley has been diverted, in order that the bed may be mined to a greater depth than the native workmen were able to go without pumping machinery.

The slow progress in development is partly due to the malarious character of the climate; almost the whole of the staff have suffered from fever, and some have resigned in consequence of continual attacks; even in March when the climate seemed excellent, I found several of the employés suffering. This difficulty will decrease as the staff become acclimatised, and as better food is procurable, for which arrangements have now been made. The town of Mogok has about 3,000 inhabitants, entirely supported by the ruby trade; it is a flourishing settlement and the great wealth of many of the inhabitants testify to the richness of the industry. Many of the wives and daughters of the miners wear valuable jewellery, and the houses are substantial and well-built. The country around is however most sparsely inhabited and the labour, which is expensive, is mostly drawn from the Chinese frontier, and has only hitherto been available for a few months in the year. The staff at Mogok are thoroughly sensible of the necessity of exerting themselves to the utmost to obtain favourable results, and there is every reason to hope that this will ere long be attained.

The head of the Local Government, Sir C. Crosthwaite (accompanied by the Financial Commissioner), was with me at Mogok during my entire visit. From them, as from the local officials, the utmost assistance has been received, and the Government are warmly interested in the success of the Company's operations.

In conclusion, while it would be unfair to look for immediate returns from an undertaking to which so many unfavourable conditions are attached, I have no doubt whatever, that before very long, when our machinery is in operation and as the staff become acclimatised, satisfactory results will be attained, and the anticipations formed respecting this property be fully realised. I am convinced that the rubies are to be found in the Company's concession in large quantities; and energy on the part of the Company's officials in Burma will ensure their being found, when approved machinery has been set up and sufficient and reasonable time has been allowed for the development of the property. An early meeting of the shareholders will be called, and any further information which may be desired will be fully furnished.—*Pioneer.*

MISNOMERS.—The Providence "Journal" calls attention to some curiosities of misnomer. Blacklead is not lead at all, but a compound of carbon and a small quantity of iron. Brazilian grass never grew in Brazil, and is not grass—it is nothing but strips of palm-leaf. Burgundy pitch is not pitch, and does not come from Burgundy—the greater part of it is resin and palm-oil. Catgut is made from the entrails of sheep. Cuttle bone is not bone, but a kind of chalk once enclosed in the fossil remains of extinct specimens of cuttle-fish. German silver was not invented in Germany, and does not contain a particle of silver. Cleopatra's Needle was not erected by the Egyptian queen, nor in her honour. Pompey's pillar had no historical connection with Pompey in any way. Sealing-wax does not contain a particle of wax, but is composed of Venice turpentine, shellac, and cinnabar. The tube rose is no rose, but a species of polyanth. The strawberry is no berry, but only a succulent receptacle. Turkish baths did not originate in Turkey, and are not baths, but heated chambers. Whalebone is not bone, and is said not to possess a single property of bone.—*Medical Record.*

ANOMALIES OF POISONOUS PLANTS.—The *Cicuta virosa*, or Cowbane, is poisonous to oxen but wholesome to sheep, goats, and horses, as Lucretius long ago recorded. White-ants feed with impunity on opium. The landcrab feeds upon the mancikeel tree, one of the most deadly of trees. The *boxia*, or grosbeak, of the Bahamas, eats the fruits of the *Amyris toxifera*, or poisonous ash. The berries of the spurgelaurel, *Daphne laureola*, are poisonous to animals, but birds eat them freely. The young buds of *Kalmia latifolia* speedily kill cattle if they browse on them, but afford abundant food to pheasants in early spring, and although the birds do not suffer, persons who partake of such pheasants show alarming symptoms of poisoning. A similar result is observed from bees feeding upon other plants of the same natural family as the Kalmia (*Rhodoraceæ*). In the celebrated retreat of the ten thousand, the soldiers of Xenophon suffered severely from eating honey near Trebizond, collected from the *Azalea Pontica*. The darnel, *lolium temulentum* (the *infelix lolium* of Virgil, the tares of Scripture), injures all animals, yet chickens eat the seeds with greediness. Horses feed with avidity and thrive on the *agrostis arundinacea* (Linn.), or reed bentgrass, which is destructive to goats. Many similar facts are noted by botanists, and they show the futility of defending cruel experiments on animals by appealing to the effects of substances on other organisms. What is food to one is often poison to another.—*Ibid.*

TEA AND CINCHONA IN CEYLON.

THE TEA AND CINCHONA ENTERPRISE OF MESSRS. KEIR, DUNDAS & CO. ON LOOLE CONDERA AND MR. JAMES TAYLOR'S MERITORIOUS PART THEREIN.

The discussion regarding a testimonial to Mr. James Taylor justifies the publication of the following letter. It was put into type and our note written in Feb, 1878, that is *twelve years* ago last Feb. (!); but it was held back, we think, because Mr. Taylor feared his employers might object to the publication of the details. Now, we consider that the document is an important contribution to the History of the Tea and Cinchona Enterprise in Ceylon.

Loole Condera, February 16th, 1878.

A. M. Ferguson, Esq., and J. Ferguson, Esq.

My dear Sirs,—I have to thank you kindly for your very favourable notice of our Loole Condera tea in a late *Observer*. It is now being made of a better average quality than before. But it will not be all it should be till we get it in larger quantity so as to require a European or good conductor to constantly supervise the manufacture. I can see only very little of it, and beyond that it is left to a kangany and the coolies. But such a notice of it in the *Observer* is very valuable. I must explain to you, however, that bad tins have been got by people frequently, not from any fault on the estate but by a mistake in Kandy. I used to send a lot of it to Kandy, to Messrs. Keir, Dundas and Co.'s office, in large caddies, not soldered up; understanding that they were selling it by the lb loose or untinned. But they took to putting it in tins and soldering these up in Kandy. I supposed that this would not do, and stopped it as soon as I heard of it, or heard of tea being so spoiled. It soon gets damp in the caddies, and I fancy got more damp still in being transferred from them to tins where they had no firing places to dry it first. Not only this, but they apparently tinned up "red leaf" too; and that also damp. I send several caddies of "red leaf" at the end of each year's crop, with special explanations of its inferiority and instructions to keep it apart and dispose of it in any way or at any low price they choose. Some of these tins it would seem were still in their hands recently, and may be yet. They themselves sent out three of them that had been returned by Dr. Thwaites, of Peradeniya, *quite recently*, and asked me to explain the matter! Two of these tins were red leaf *purely*, and perfectly mouldy; the other tin being proper tea but also perfectly mouldy. Seeing I never tinned any red leaf, I had no difficulty in saying that it was tea tinned in Kandy and spoilt in being so. But it is long since I stopped sending them any loose tea now, excepting the little "red leaf" collected during the year at the end of each crop, which will still go forward open. All of it is tinned on the estate now. I have also got the tins made so that they must be destroyed in the opening, as I found that people kept their tea in the tins, or let their servants do it, and consequently the tea got spoiled and often mouldy and musty before the tin was finished; especially in damp weather. This made some people believe that we put bad tea into the bottom of the tin and good tea on the top! K., D. & Co., too, stopped taking back our first style of tins with hinged lids, as they were generally returned filthy and stinking of oil and onions and salt fish, &c.

But now, I am going to be down on you! Although you have publicly given us credit for various things connected with tea and cinchona, some of which were no fairly due to us, yet you have never given us credit for the main things that are our due. I claim that both the tea and cinchona enterprises were first successfully started on Loole Condera. I do not admit the Messrs. Worms' old tea experiments into the matter, as they were failures; and long ago given up when we began. The plants were allowed to remain, but there were many tea plants in gardens, and so on, over the coffee districts besides them. The starter of the present tea enterprise was, to the best of my knowledge, Mr. G. D. B. Harrison, who, in 1865, gave me orders to get all the tea seed I could from Peradeniya and grow it so as to have a supply of seed from it by-and-bye. I began in 1866, to plant out tea plants along the roadsides here. At that time I knew nothing of the Assam indigenous and hybrid varieties. Our first tea clearing of twenty acres was felled in the end of 1867, a year before the Ceylon Company felled any land of their estates for tea. Our clearing was mentioned in the *Kandy Herald*, at the time it was felled. The Ceylon Company felled small pieces on several of their places the year after, perhaps as much, or may be more, acreage than our clearing altogether. However, our first year's importation of seed from Assam completely failed to grow. We got our second importation of seed next year at the same time as the Ceylon Company got their first and both grew. So that they and we both began the actual planting out of *hybrid* tea at the same time, or same season. Then as for making tea I was making it from old bushes in the garden and from roadside planing years before Mr. Jenkins, the Ceylon Company's tea manager, came to Ceylon. Some of what I made then was fairly good tea though I could not believe it was right because it did not taste like the China tea of the shops. I gladly confess that Mr. Jenkins, after he came, showed me how to do it better and gave me confidence in the article. But a sample made by me before he came, sent along with a sample of his making, was valued in Calcutta at only 3d a lb. less. Before Mr. Jenkins gave me confidence that the tea was correct, I spoiled large lots of it experimenting, trying to make it taste like the tea I bought in Kandy from shops.

You will see from this that a statement in one of your Directories of tea acreage planted is wrong for the earlier years. There was more planted than you state; but I cannot find that statement in the Directory now, else I would help to correct it. But on this place there were twenty acres planted, besides roadsides equal to a good few acres, before the end of 1869.

Then, as regards Cinchona: we were not the first to plant a patch of it, though we planted five or six acres of it pretty early. But the small lot mentioned in Howard's big book as the "first instalment from the Ceylon plantations" was peeled on Loole Condura in July 1867, both Succirubra and Officinalis. But so little did K., D. & Co. trouble themselves about it that it only got into the market in April 1868. It was mentioned in several papers that I saw about the time and I knew it was our sample they referred to from the remarks made, being the same as Howard's report on it that I had got, and from dates and the quantities corresponding, and the words of Howard's report being quoted. One paper or magazine put it down as from the Ceylon Government experiment. Our first extensive peeling was in April 1870, of considerably over a ton of dry bark, partly succirubra and partly officinalis. Long after this was sold in the London market, the *Observer* mentioned that it had discovered the fact from a Home paper and asked how such a thing could have happened unknown to it. We sent home further lots in 1871 and 1873. As a result of the sale of the first lots, we got all the officinalis plants out of the Hakgala nurseries, even the old stock plants, about three hundred thousand altogether, and got them for nothing, as there was no demand for cinchona by anyone else. We then went in for planting cinchona extensively; but we had considerably extended our cultivation of it before that on the strength of the sales and Howard's report on our original sample. Not very long after cinchonas planted at Hakgala were being sold at high prices, but the demand was mostly for succirubra plants, of which we had taken none. So that our having cleared out the stock of officinalis plants did not, I suppose, much matter. What we have done here has been a guide and a warning to others all along, and is so still, and a great deal of cinchona and also tea, I believe, has been planted on the strength of it. What we have learned here has been freely communicated to all who have asked information. If you will allow me to say it without thinking that I have any selfish object in view, I consider that, if the Ceylon Government had any sort of soul in it to encourage

European enterprise instead of simply existing to take advantage of it, Massrs. Harrison and Leake ought to get a free grant of a block of land for cinchona and tea, or be offered it.*—Yours very truly,

JAMES TAYLOR.

AUSTRALIAN PRODUCE FOR CEYLON.—We can testify that the cheese, bacon and butter consigned to Messrs. Auwardt & Co., as advertised, from the farfamed Illawara district of New South Wales is specially deserving of attention here. Each article seems good in its degree—good valuo for the price charged—and planters especially will favourably bear in mind that the proceeds of the sale of this produce is to be re-invested in Ceylon tea for the benefit of the Illawara farmers and other residents.

BRAZIL COFFEE.—The coffee crop now in course of shipment from Santos to the markets of Europe and the United States is estimated to reach 2,000,000 bags (132 lb. each) by June 30th, 1890, the end of the crop year. This is a falling short of over 1,000,000 bags on the production of last year, due to the fact that a small bearing generally succeeds a heavy one, the previous harvest of 1888-89 having been the largest on record. Although the present crop is a small one, its monetary value is in excess of the last, in consequenco of the higher prices obtained.—*H. and C. Mail.*

THE SOURCES OF BEAUTIFUL COLOURS.—The *American Druggist* has formulated a list of the choicest colours used in the arts, as follows:—The cochineal insects furnish a great many of the very fine colours. Among them are the gorgeous carminc, the crimson, scarlet carmine and purple lakes. The cuttle-fish gives the sepia. It is the inky fluid which the fish discharges in order to render the water opaque when attacked. Indian yellow comes from tho camel. Ivory chips produce the ivory black and boneblack. The exquisite Prussian blue is made by fusing horses' hoofs and other refuse animal matter with impure potassium carbonate. This colour was discovered accidentally. Various lakos are derived from roots, barks, and gums. Blue black comes from the charcoal of the vine stalk. Lamp black is soot from certain resinous substances. Turkey red is from the madder plant, which grows in Hindostan. The yellow sap of a tree of Siam produces gambcge; the natives catch the sap in cocoanut shells. Raw sienna is the natural earth from the neighbourhood of Sienna, Italy. Raw umber is also an earth found near Umbria and burnt. Indian ink is made from burnt camphor. The Chinese are tho only manufacturers of this ink, and they will not reveal tho secret of its manufacture. Mastic is made from the gum of the mastic tree, which grows in the Grecian Archipelago. Bister is the soot of wood ashes. Very little real ultramarine is found in the markot. It is obtained from the precious lapis-lazuli, and commands a fabulous price. Chinese white is zinc, scarlet is iodide of mercury, and native vermilion is from the quicksilver ore called cinnabar.

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* And certainly Mr. James Taylor ought to get one of the best blocks in the country. Messrs. Harrison and Leake deserve credit for their enterprise, and it is much to bo regrottod that they suffered so greatly the usual fate of pioneers. But as regards both tea and cinchona the intelligent, energetic and persevering Superintendent of Loole Condera was the first man "to teach the English how to do it." Much of what Mr. Taylor now communicates reached the senior editor long ago and has been tied up with a mass of other matter on tea and cinchona to be worked wheu time could be got. But each day brings more than its work. One small fact will show how conscientiously careful Mr. Taylor is in his work. Strict cleanliness is of much importance in the preparation of tea; and when coolies are seen dressed in specially clean clothing, the remark made is, "Some of Taylor's tea coolies."—ED. *T. A.*

FINE PRICES FOR COCOA.—Ceylon cocoa is now one of the most valuable products sent out of the island, and is in great request. Some cocoa from one of Mr. J. H. Barber's estate has just been sold, we hear, for R58 per cwt. This is a fine price considering the high rate of exchange at present, and should encourage all those who have suitable land for this very remunerative product.

MINERAL RUBBER.—The *Bulletin du Musée Commercial* gives currency to a report from an American source that an American has discovered a means of producing, by distillation from coal, a bituminous substance possessing all the qualities of rubber, and which may be equally well used in the manufacture of submarine cables. The cost of this article is said to be much less than that of vegetable caoutchouc.

COFFEE.—There have lately been frequent calls for Mr. W. B. Forsyth's report on coffee, and as the number of the *Monthly* which contained them is exhausted, it is reprinted in this issue with Mr. Kinney's—both of which are valuable to those intending to engage in coffee planting. Among all the minor industries adapted to our climate, there is none whieh will pay better than coffee cultivation. Kona coffee is worth to the grower twenty cents a pound, and probably will command that price for many years, as it has no equal.—*Planters' Monthly*, (Hawaiian).

GEMS FROM GAS REFUSE.—To make precious stones from gas-refuse is indeed—says the *L. & C. Express*—to squeeze out the romance which should cling to "pearls from the ocean and gems from the mine." Mr. Greville Williams, of the Gas Light and Coke Company, has made a perfect emerald from the refuse of a gas retort. That this was possible has been known to science for two generations. But although there is nothing new in this ingenious play with science—despite, too, that the cost of making the gem was ten times its highest value—the news has caused some alarm among possessors of fine emeralds.

PLANTING IN NORTH BORNEO.—At the ordinary general shareholders' meeting of the Labuk Planting Company at Hongkong on the 5th instant, the report presented was passed after the Chairman had said that he could add very little to it, except that the latest accounts from the manager were very encouraging, and although there must be numerous difficulties met with the first year he hoped they would vanish as time went on. The trouble in starting a plantation was getting labour—it was the case with all new estates. He admitted that the item of $15,717 in the accounts under the head of "labour" meant squeezes to coolie brokers, but pointed out the impossibility of getting coolies without paying for them. He was hopeful of getting the money back in the form of labour.—*Straits Times*, May 18th.

DENDROBIUM MACCARTHIÆ.—In copying the following paragraph from an American periodical, *Garden and Forest*, we may state that this plant was named in honour of Lady MacCarthy by the late Dr. Thwaites, who was the first to describe it:—

This magnificent plant is now flowering freely at Kew. It is one of the least common in gardens from the fact of its being bad to cultivate. It is found only in Ceylon, where it is much less plentiful now than it was a few years ago, owing, probably, to the visitations of the Orchid-collector. The Kew plants have this year made pseudo-bulbs over a yard long, and they bear near the top pendulous, three-flowered racemes, each flower being four inches across when fully expanded; the colour is pale rosy mauve, with a large blotch of maroon-purple on the lower part of the lip, and streaks of the same color on the front portion. The Kew plants are grown in a very hot, moist stove, where they are kept saturated at all times save when the leaves are falling. It grows all through the winter, the flowers pushing immediately after the leaves have fallen.

HOME CRITICS ON CEYLON TEAS.

It may be relied upon, we think, that, as a general rule, the verdict of the public is the most satisfactory test of the quality of any article of food consumption. If that reliance may be accepted, we may say that our teas have stood this test for they have received the warranty of public taste. It is, however, constantly the case that papers published at home offer to their readers comments upon the method of their manufacture which would seem to imply that there yet remains much room for improvement in that method. We are not at all disposed to offer objection to this. In the first place, whether what is advanced is or is not to be justified, there can be no doubt that the articles written bring our production well before the public and so constitute for our teas a valuable advertisement. In the second, if there be truth in the old proverb that "in the multitude of councillors there is wisdom," we are afforded by them an opportunity of discriminating for ourselves amid such diverse advice.

Nevertheless we must bear well in mind the character of the sources from which many of the comments referred to emanate. What may be termed trade journals are, we think, not unfrequently biassed by the interests—or the supposed interests—of their chief readers, the retailers of tea. Among these there must be many who are influenced by a variety of causes in favour of promoting the sale of some particular kind of tea. One such dealer, we will assume, has a large constituency among whom he has hitherto distributed chiefly the teas of China growth. Another may be so influenced mainly to support Indian teas. Such men have probably resorted to long established agencies for their purchases, and have secured by their long custom exceptionally favourable terms. They will have no pressing desire, therefore, to force the introduction of a new growth which, if successful, must disturb the even course of their trading arrangements. For men so situated the Trade Journals must purvey sympathetic matter, and for the reasons we may perhaps believe that much that appears in the columns of such papers may be the result of a concealed bias. The arguments that we have thus applied in the case of the retail-dealers are not wholly inapplicable to a higher grade of the distributing agencies. Among the brokers of London there are firms who, equally with the retail grocer, have long made a speciality of certain teas. When firms coming within such a category issue their circulars, they are just as likely to have their advice tinctured by preconception as are the grocers in their dealings with their old-established customers. Of course we would except from brokers liable to such an influence, many well-known firms whose advice may always be accepted with confidence and whose comments should command our fullest attention. But even when such exceptions are made, there remains a residuum of the often-repeated complaints which should, we think, always be accepted with reserve.

But whether this caution may or may not be justified, one fact is certain, and that is that the constant and very often contradictory advice given is very perplexing to our planters. A very well-known firm of high standing has once more made public a statement that Ceylon teas are as a rule over-fired, and that statement has formal support by one of the trade journals to which we have referred. Our tea planting industry is now by no means a thing of today, and its production has stood the test of a good many years. The result of that test has been to secure the suffrage of an enormous number of tea drinkers throughout the world. If we are to accept the counsel now tendered to us and alter our methods of preparation, is it certain we shall still retain that suffrage which has been accorded upon the experience of our present methods? We do not say that we feel confident that no better method is open to us; but for the reasons we have above stated we would advise caution in placing implicit confidence in the soundness of the counsel which is so constantly given to us by the distributing agencies at home.

Indian Soapstone.—Steatite or soapstone is rather extensively used by gas manufacturers at Home, but at present their requirements in this respect are met from Germany principally. Some time ago the value of Indian soapstone attracted attention, and experiments were made and promised successfully. A more extensive trial is now to be given to the Indian product, and the Madras Government are sending some tons of the material home, where the India Office will cause it to be experimented with and reported on.—*Indian Engineer.* [Steatite, we believe, is amongst our Ceylon rocks.—Ed. *T. A.*]

Bricks Superseded.—A Madras contemporary makes the announcement that bricks are to be superseded. A composition called petronite has been discovered which, besides being cheaper than bricks, is of snowy whiteness, and of the hardness of granite. It is made of sand and silica, burnt, ground up, moulded with moisture under great pressure, and then re-burnt. As it shows neither expansion nor contraction after burning, and as it is capable, when in its moist condition, of being sculptured to any desired extent, it will be of high value for decorative as well as for ordinary building purposes.—*Indian Engineer.*

Tea in Japan.—The *Japan Weekly Mail* of 31st May says :—

The tea trade goes on apace; 20,009 piculs of leaf were taken during the week, and some firms have been firing almost incessantly. As remarked as probable last week, the estimated weight of the first crop was somewhat erroneous, and this is now admitted, as the shortage, if any, will be comparatively slight. Second crop leaf will be on the market by the 5th of June, but as to quality nothing can now be said, though the weather reported from the principal districts is not unfavourable to good cup.

The same paper in its issue of 7th June says :—

Tea has fallen off somewhat in demand, though firing is still general. Parcels of second crop have arrived, and are reported good both in leaf and cup, and in another week a large quantity is expected to be on the market.

Prevention of Scale in Steam Boilers.—The *Chemical Trade Journal* recommends that water used for boiler purposes should be so treated before entering the boiler, that all formation of scale shall be prevented, and deprecates the use of substances which merely prevent the scale from adhering to the boiler. As an example of how various precipitating agents may be used in conjunction with one another a water which contained 5·2 grs. of calcium carbonate, 24·3 grs. of calcium sulphate, 0·15 grs. of magnesium sulphate, 4·27 grs. of magnesium chloride, 17·27 grs. of magnesium nitrate per gallon, was treated with a mixture of 17 grs. of caustic soda—77 per cent.—17 grs. of sodium carbonate, 5 grs. of tribasic phosphate of sodium, with the result that of 12·9 grs. of lime only 0·78 grs., and of 6·6 grs. of magnesia only 3·78 grs. remained to enter the boiler and this at a cost of 3½d per 1,000 gallons. The precipitate amounted to 25 tons semi-dry sludge—or nine tons dry—from 5 million gallons of this water per week.—*India Rubber Journal.*

ASSAM AND CEYLON AND THEIR TEA CROPS.

Assam-proper and Ceylon will this year be very nearly matched in the tea crops likely to be harvested within their bounds; and it should be extremely interesting to watch henceforward the development of each country under tea production and export. We are apt to regard "Assam" as if it really represented the great Indian tea enterprise altogether; but of 115 million lb. expected to be harvested in 1890-91 for all India, less than half—or 48,295,344 lb.—is put down for "Assam" proper. Now against this Ceylon may ship 47 millions in the present year—or possibly more? Already up to 19th June, the return is of 22 millions,—say 24 millions to 3rd July,—and the larger shipments have uniformly been in the latter half of the year.

The Indian Tea Association as we have indicated treat "Assam" separately from "Cachar and Sylhet," the current tea crop of the latter being given at 33,385,650 lb.; but unfortunately they do not give us the acreages of cultivated land on which their estimates are based; and when we turn to the official records we invariably find that "Assam" includes "Sylhet and Cachar." One official return, for instance, gives the area under tea in Assam in 1889 as 227,249 acres:—196,689 acres mature and 30,560 acres young tea. Another Indian Bluebook return makes the total for 1888-89 as 216,676 acres, but this extent, we find on going over the detailed statements is made up as follows:—

		Acres.			*Acres.*
Cachar	equal to	55,401	Sibsagur	equal to	47,377
Sylhet	,,	44,145	Lakhimpur	,,	32,144
Goalpara	,,	367	Naga Hills	,,	——
Kamrup	,,	6,227	Khasa and		
Dairang	,,	20,012	Jaintia Hills	,,	30
Nowgong	,,	10,973	Garo Hills	,,	——
				Total acres	216,676

Deducting 99,546 acres for Cachar and Sylhet, we have only 117,130 acres for "Assam-proper" to represent the estimated current crop of 48,295,344 lb. and this shows an average outturn of over 400 lb. per acre. In the case of Cachar and Sylhet, the crop estimated is equal to 340 lb. an acre, and that without making allowance in either case for immature tea. Ceylon on the other hand will gather her 47 to 48 million lb. from a considerably larger area nominally; for even leaving out all tea planted within the past three years, we cannot reduce the area below 150,000 to 160,000 acres. Of course the Assam tea fields are on the whole much older than ours, and if we suppose that 105,000 acres represent the mature tea yielding 48 million lb., we may get a fair idea of the difference in yield. The explanation of course, is that Assam was all planted on virgin land (forest or otherwise), whereas the greater proportion of Ceylon tea is found on old coffee plantations varying from those that scarcely yielded any coffee crops to others so long heavily cropped with the fragrant berry that 200 lb. of made tea per acre is a liberal estimate of their yield in this new era. Although therefore, Ceylon may steadily compete with "Assam" (in the limited sense) in her total crops, it must be borne in mind that our harvesting will be from a considerably wider area in tea. The total extent in tea in Assam districts, Cachar and Sylhet, —whether 216,676 or more likely 227,249 (including 30,560 acres young tea)—is singularly close to the present return for Ceylon of 219,487 acres; but the difference is that the former is to give nearly 81¾ million lb. tea this season against not more than 48 millions for Ceylon.

CROCODILE AND LIZARD LEATHER.

It has been said—and, doubtless, with full truth—that there is nothing in created nature which does not serve, or cannot be made to serve, some useful purpose to man. We confess that with regard to the crocodiles, or, as they are often popularly but incorrectly termed, alligators, which swarm in our inland waters, we have often found it difficult to recognize the part they have been destined to play in nature's economy. As scavengers they certainly exercise a useful function; but their wonderful fecundity carries them beyond the sufficient fulfilment of this object, and the enormous numbers of them, which may almost be said in some parts, such as the neighbourhood of Mullaittivu, to thicken the waters of our lakes, pools and tanks, constitute an undoubted nuisance as well as a considerable danger to many of the native community. Some time ago we made reference to the demand which had sprung up in all European countries for the skins of these saurians; and having then drawn attention to the possibility of Ceylon usefully meeting that demand, we should have hesitated to have again advanced the subject, were it not for a further "craze" arising in those countries which might, we should say, be met with advantage from this colony.

We allude to the very extensive adaptation of lizard and even snake skins, in many articles of personal adornment. The category of these is almost an endless one; but we may specially instance such items as ladies' waist-belts and watch-bracelets, purses, whip handles, cigar and cigarette cases. In fact, a walk now through the principal streets of London or Paris reveals in their shop windows a vast variety of instances of the application of the skins of these reptiles to such and similar articles. We may be sure that these would not be exhibited in the profusion that may be witnessed were it not that they meet with a ready sale indicating a strong appreciation on the part of the public. Now Ceylon abounds only too profusely, not only with the crocodiles first referred to but with a great variety of many-colored lizards, and with the inducement now offering of a profitable market for their skins, why should not some of our native people undertake the collection and shipment of these?

We shall probably be told that the art of proper preparation is at present unknown in the island. But every civilized Government makes it one of its chief duties to stimulate new industries; and in tropical countries, in which the local authorities stand almost *in loco parentis* towards the natives, this duty assumes a special weight. We have but to read the reports of the consular agents of European countries to realize how important a part they are called upon to perform in suggesting new openings for trade or fresh industries likely to benefit the nationalities they represent. Ceylon, of course, has no such official representatives abroad. The duties therefore that are cast upon those to whom we have referred must naturally in our own and similar cases devolve upon the resident authorities. We can conceive of scarcely any case calling more strongly for the preliminary aid the authorities alone can afford the people than the one we are now dealing with. We have among us what, while unavailed of, is both a positive nuisance and a danger. It is possible to diminish this, and at the same time by doing so to place within the reach of a population not too well supplied with the means of earning a livelihood what promises to be an easily learned and profitable industry. What greater inducement could there be

to incite to action a Government which, as we have said, stands in almost a parental relation to the people over which it rules?

In this particular case the assistance to be asked for is light, and the cost of it must be trifling. We want instruction as to the right method of utilizing the supplies so ultra-liberally provided by nature. This it should be neither difficult nor costly to obtain. But perhaps it may be said that before seeking such instruction we want enlightenment as to the prices such skins as we have referred to fetch in the markets of Europe. This, however, we think, might probably be dispensed with, for we may be perfectly sure that those markets would not be supplied as they are unless a paying price was obtainable for the commodities. We may be equally certain that no country in the world produces these saurians and reptiles in more lavish abundance than does Ceylon, as also that their capture can scarcely anywhere be effected with a less expenditure of labour or at less cost than it could be among our own people here. There is *prima facie* evidence therefore that the systematic collection, preparation, and shipment of these skins should prove remunerative. What is wanted is only the knowledge of how to prepare them to suit the requirements of distributors at home. A reference through the Crown Agents to those engaged in the trade in London would secure all the preliminary information necessary and at the same time the services of an instructor competent to impart the required knowledge to selected individuals among the natives, through whom again such training might be distributed throughout the island. We may be told that if the prospect of success be so assured as we hold it to be, it should rest with our mercantile community to inaugurate and be at the expense of the earlier trials. But it will be recognized, that a novel departure of the kind referred to requires some initiatory fostering, and we think this might well be officially given, at any rate to the extent of seeking information through the Crown Agents upon which further action might be based.

THE CEYLON ESTATES INVESTMENT ASSOCIATION (LIMITED).

Report by the Directors to the Sixth Ordinary General Meeting, to be held on Wednesday, the 11th day of June 1890, at 12 o'clock noon, within the Accountant's Hall, 106 West Nile Street, Glasgow.

The Directors beg to submit herewith the Accounts for the year to 31st March, 1890, and they are glad to be able to report such very favourable results.

The most of the Coffee Crop was, this year, sold in London, the average price being 101/8 per cwt., which the Directors consider very satisfactory. The Crop was, Glencairn 1,404 bushels, MacDuff 1,123 bushels, or more than double the estimates.

This year only 22,235 lb. Cinchona was harvested, on account of our only having taken the bark from dying trees. The good trees were not touched as recommended by the Company's Agents in Ceylon.

The Tea Crop has again been very satisfactory, and the prices realised have been considerably better than those obtained the previous year.

In consequence of the great increase in the Coffee Crop, and the high prices realised therefor, and also the increased prices obtained for the Tea, the balance at the credit of Profit and Loss Account, including £55 4s 5d brought forward from last year is £3,515 8 8

The Directors think it advisable to reduce the sum appearing at the Debit of the Tea Machinery and Factory Account, and they propose to apply the above Profit:—

1. In writing off that Account ..	£1,000	0	0
2. In payment of a Divident of 7½ per cent free of Tax, ...	£2,306	5	0
	£3,306	5	0
Leaving a balance of	£209	3	8

to be carried forward next year.

The addition to the Glencairn Factory, and the putting in of the Steam Engine and Boiler have been completed at a cost of £571 13s 11d, and the Directors anticipate considerable benefit will accrue to the Company therefrom, as working by water power was during the dry season very unsatisfactory, the supply being altogether inadequate.

The Directors authorised the conversion of the buildings on Macduff into a Tea Factory. The alterations have been completed and the necessary machinery put in at a cost of £447 5s 9d. The Tea, manufactured and sent home, has brought very good prices, and the Directors expect that this will also prove of great advantage to the Company, as a considerable sacrifice had to be made when the Tea was sold green.

From the Balance Sheet it will be seen that the outstanding Debentures amount to £2,850. These all fell due at Whitsunday last, and have been repaid, so that the Company is now free of Debenture Debt. It will also be seen that the Loans over property in Ceylon have been reduced during the year by £1,798 5s 9d.

The prospects for the coming year are not so favourable. Owing to the exceptionally large coffee crop this year, the Directors are advised that they need not look for much of this product during the current year. The estimate of the tea crop is, however, very satisfactory, and the Directors are hopeful the coffee crop may yet improve, and that a better yield than that now anticipated may yet be obtained.

The Directors have to record, with regret, the resignation of Mr. Nathaniel Spens, on account of his having left Glasgow for London. Mr. Spens was appointed Chairman on the death of Mr. Brooks Wright, and all along took a deep interest in the affairs of the Company. The Directors elected Mr. Hugh Brown Crum, Stock-broker, to succeed Mr. Spens on the Board.

The Directors who retire at this time, in conformity to the Articles of Association, are Mr. Robert King and the Rev. Dr. Grand. They are eligible and offer themselves for re-elcetion.

The Auditor, Mr. Moore, C. A., also retires, and he is eligible to be re-appointed.

J. B. MACBRAYNE, *Chairman.*
BROWN, FLEMNIG & MURRAY, *Secretaries.*

163 West George St.,
Glasgow, 2nd June, 1890.

BALANCE SHEET AS AT 31ST MARCH, 1890.

Liabilities.

		£	s.	d.
Capital Account— 15,000 shares of £4 each, £60,000 of which paid up £2 per share		30,000	0	0
Debenture Account		2,850	0	0
Interest on Debentures, &c., accrued but not due		55	19	11
Sundry Creditors		1,272	17	5
Profit and Loss Account		3,515	8	8
		£37,694	6	0

Assets.

		£	s.	d.
Glencairn and Macduff estates owned by the Association taken at cost price ...		25,078	2	6
Loans over Landed Property in Ceylon ...		2,114	10	0
Tea Machinery and Factory		1,460	14	0
Interest accrued but not due		45	11	3
Sundry debtors including outstanding Account Sales of Produce		1,672	3	6
Produce on hand		2,064	8	6
Cash on Deposit and with Bankers at Home and Abroad	£5,194 18 10			
Due by Secretaries ...	63 17 5			
		5,258	16	3
		£37,694	6	0

PROFIT AND LOSS ACCOUNT FOR YEAR TO 31ST MARCH, 1890.

Expenditure.

		£ s. d.
To Ioterest on Debentures paid and accrued ...		142 0 1
,, Salary of Foreigo Agents ...	£199 12 8	
,, Do Secretaries ...	150 0 0	
		349 12 8
,, Law and Audit Charges		36 10 7
,, Books, Stationary, &c.		8 2 10
,, Charges		15 12 6
,, Telegrams		23 7 6
,, Income Tax...		32 8 2
,, Postage and Petties		9 2 7
,, Directors' Remuneration		120 0 0
,, Directors' Travelling Expenses		12 12 0
,, Advertising		0 11 6
,, Depreciation		49 1 6
,, Balance, being Profit on year		3,515 8 8
		£4,314 10 7

Revenue.

		£ s. d.
By Balance from last year		81 9 5
Less : Income Tax on Dividends ...		26 5 0
		£55 4 5
,, Profit on Year's Working of estates—		
Produce sold and on hand	£8,000 18 5	
Less : Expenditure	4,072 12 11	
	£3,928 5 6	
Less : Loss on Realisation of 1888-9 Produce	20 10 10	
		3,907 14 8
By Exchange		28 5 7
,, Interest on Investments		281 4 10
,, Commission		39 13 7
,, Registration and other Fees		2 7 6
		£4,314 10 7

BROWN, FLEMING & MURRAY, Secretaries.

THE LIBERIAN GOVERNMENT CONCESSIONS AND EXPLORATION COMPANY, LIMITED :

INDIA-RUBBER.

The prospectus informs us that "this company has been formed for the purpose of purchasing the valuahle India-rubber concession, granted by the Government of the Republic of Liberia, West Coast of Africa, for the sole right of collecting the India-rubber grown on all the government lands and forests, and the sole right of exporting all India-rubber grown within the territories of the Repuhlic of Liberia, such concession further granting the concessionaires 2,000 acres of land, to be selected by them, for the purpose of erecting warehouses, stores, residences, and establishing depôts, wharves, and trading stations, or for such other purposes in connection with the ooncession as the concessionaires may from time to time deem necessary or desirahle, and to be held free of any chargo whatever; and if hereafter thought desirable, work such concession, or to sell or lease the whole or portions there of to companies or individuals; and also to take over, work, sell, or lease to companies or individuals, at the discretion of the directors, any other concession or concessions which may now or hereafter be obtained by the company from the Government of the Liherian Republic. The rubber concession covers the whole area of the government lands on which the gum elastic rubber tree is found, producing rubber of the best West African quality, and the Government estimate that a minimum of 2,000 tons can bo collected annually, (and also the sole right of exporting all other rubber grown withiu the territories of the Republic of Liberia) which, delivered in Loudon or Livorpool, including the ro yalty to be paid to the Government of Liberia, will it is estimated show a profit (if only realising 1s per lb.) of £112,000 per annum. Labour is cheap and plentiful, and the natives of this part of Africa are industrious. The use of rubber is being very largely extended, and is being brought into general use for manufacturing purposes, and is now being extensively nsed in Berlin, Hanover, and Hamburg, in connection with other materials, for paving the streets, and no doubt will soon be applicable for many other similar purposes."

The area of the Republic is estimated to be about 150,000 square miles, or about 96,000,000 acres, most of which is of the richest character, yielding almost every known kind of tropical produce, whilst the value of its mineral wealth can scarcely be estimated.

But besides trading in India-rubber, the company propose also to procure further concessions for getting and workiug minerals; for cultivating fibre-producing plants, &c.; for collecting palm oils, indigo, timber, and dyewoods; for trading in ivory, &c.; and also for a chartered State Bank, and various public rights. The Liberian Government has undertaken not to grant these concessions without first offering them, through Mr. Ellis Parr, to this company.

The price to be paid to the vendor (Mr. Ellis Parr) for the India-rubber concession, and in respect of his interest in the other concessions whioh have been applied for, has been fixed by the vendor at £70,000, payable as to £7,000 in cash, and as to £23,000 in fully paid ordinary shares, £3,000 in deferred shares, and the balance in cash or fully paid ordinary shares, or partly in cash and partly in shares, at the opinion of the directors; the deferred sbare ranking only for dividend after the company has earned sufficient to pay a dividend on the ordinary paid up capital of twenty-five per oent, when the deferred shareholders, after receiving a dividend of twenty-five per cent, will be entitled to one-half of the balauce of the remaining profits.

It will be seen that the proposed operations of the company are varied and extensive, and the prospects, as set forth by the promoters, are certainly sufficiently alluring. The capital asked for is £110,000, and if this is promptiy supplied, and if the right men are put in the right place, and wise methods of prooedure are adopted, we do not see why the glowing results anticipated should not be largely realised.—*Electrical Trades Journal.*

TEA GARDEN COOLIES IN ASSAM.

To the Editor of the *Indian Agriculturist.*

Sir,—Many of your readers are no doubt interested in this vast tea district where so many labourers from Bengal are employed, and would like to hear of their condition, and the treatment they receive from the *brutal planter*. First, as regards their pay; women receive on enrolment R4 per month, and men R5 ; after the expiry of 3 years of their 5 years' agreement the pay of women is inoreased to R5 and of men to R6 per mensem, besides which they earn on an average from R 4 to 5 per month during the six most busy months of the year by doing task work after their daily allotted work has been performed. The day before yesterday I found that the coolies on one garden had finished their morning's allotted work by 9·30 a. m. they were consequently free to do what they liked uutil 1 p. m. These rates of pay compare most favorably with the rates receivod during the past year by ablebodied agricultural labourers, as published iu the *Englishman* of 16th May 1890, in Jeypore and Rajpootana, where the average rate was from R2 to 3 per mensem, where rice was selling at 8 seers per rupee; whereas up here it is selling at from 10 to 12 seers, but the coolies are supplied by the planters with that necessary of life at the uniform rate of R3 per maund, or 13⅓ seers per per rupee, although it invariably oosts the planter more. According to the *Englishman* the highest wages paid to able-bodied agricultural labourers in Oudh was R4 monthly; in the North-West Provinces from R3·12 to 5·8, with a tendency to the lower figure; aud in Bengal proper from R3·12 to 5·10. The coolies in Assam are well housed, and much attention

is paid to the sanitary condition of their lines and houses. When sick, the greatest care is taken of them and kindness shown them. In most of the tea gardens in North Lukhimpore an hotel system of feeding the coolies is carried out* by which, R3 per mensem per adult, and R1·8 per mensem for working boys (children too young to work are fed free) they obtain three meals per diem and as much at each meal as they can eat. In the early morning before commencing work each man, woman, and child is served out with a *chupattee* fried in *ghee*, a quantity of parched rice, and tea at 11 a.m., at which hour work ceases, until 1 p.m., they get a meal consisting of rice, *dhal*, vegetable curry, and tamarind chutnee, which is repeated at 7 p.m.; work ceases for the day at 5·30 p.m. Once a week they get mutton, and one chittack of mustard oil each, with which they *shampoo* themselves. I had the pleasure of seeing yesterday, 500 coolies men, women, and children, assembled in a capacious hotel building eating their mid-day meal; The waiters went round serving out the rice, dhal, curry, and chutnee until all had had sufficient, and refused further helpings. All seemed contented and happy, and on the manager asking them if they had any complaint to make about the food, he received a smile and reply from each man or woman he interrogated that everything was very good. The native doctor, who is much respected by the coolies, is present at each meal. I have noticed that on wet days most of the coolies turn out with good substantial grey blankets, and when working in the sun many of them wear large mat hats protecting their heads and a great part of their bodies. They own cows in great numbers,† and in the lines numbers of fowls and pigeons are to be seen. Without doubt the tea garden coolies are a happy and contented lot, particularly well cared for, and the greatest interest is taken in their welfare by the managers. After the expiry of their first five years' agreement an average of about 90 per cent enter upon a second agreement, which in itself is a sufficient proof of their contentment. Many time-expired men obtain grants of land from Government and open out on their own account. Influenza has been, and is still, rife among them; in one garden 400 were ill with it at one time; few deaths have occurred, and I am happy to say the epidemic is on the decrease. The greatest consideration is shown to the sick, and those in hospital are supplied free with fish, milk, sago, Liebig's extract of meat, &c. On one garden employment is given to two blind boys, and one man who is a cripple. These notes are made, Sir, from my personal knowledge and observation during a visit to North Lukhimpore, and I trust your readers will from a perusal of them consider that the adjective *brutal* does not apply to the Assam tea planter.‡ It is certainly not the opinion of the coolies as can be judged from the following incident. One night a few months ago a manager's house was burnt to the ground through the bursting of a lamp; he lost everything to his name. All his coolies came forward offering him money; he was presented with a watch, wearing apparel, numerous other articles. With these facts before them surely Government can see its way to modifying Act I of 1882, which quadruples the cost of the passage of coolies up here; but for this Act coolies could be comfortably landed at Dehrughnr at from R20 to 30 per head, whereas they now cost the planter from R80 to 100. The planters could then no doubt recruit in Jeypore, Rajputana, and the N. W. Provinces and thus help to ameliorate tho condition of the nnderpaid and undorfed labourers of those provinces.—VETERAN.

* We have frequently suggested some such system for Ceylon estates, but we suppose the curso of caste stands in the way. In Government hospitals, however, the obstacle is overcome, high caste cooks being, we believe, employed.—ED. *T. A.*

† This could not be managed on Ceylon estates, where only the conductor and a few kanganies generally have cows. The Indian estates are sometimes of large area, including grass and rice fields.—ED. *T. A.*

‡ The whole class suffer in reputation from the undoubtedly brutal conduct of a few "black sheep." Of the latter Ceylon has known some.—ED. *T. A.*

PROSPECTS FOR A NEW LOCAL INDUSTRY:

MAANA AND CITRONELLA GRASS FOR TEA BOXES.

Referring yesterday to the deterioration of our teas due to packing in chests made of unseasoned wood, we touched upon the prospect of an efficient alternative to the use of such wood afforded by the patent now being worked by the Stanley-Wrightson Syndicate. We said that this patent was still awaiting approval or condemnation, and we are not even to date able to say what the nature of the verdict upon it is to be. But intelligence conveyed to us in our London Letter to the effect that mana grass has been successfully applied to the manufacture of the board which forms the main constituent of the new chests must make us desirous to learn that the character of that verdict, when given, may be a favourable one. For, if it be so, there seems to be every chance, according to what our London Correspondent writes, that we may see established in this island two factories to undertake the making of the new material from what are now almost entirely waste products of native growth. With these would of course also be included workshops for the manufacture of the chests, which have as yet been made only at the trial factory near London.

The two items among our local products which have as yet received special mention are the mana grass which grows so freely in Ceylon and the citronella stalks which are now left as refuse after oil has been expressed from them. The first of these has already been subjected to successful trial at home, and our Correspondent has forwarded to us a small sample piece of the thick fibrous paper, resembling millboard, which has been the result of that trial. We are assured that so good an authority as Dr. P. Norman Evans, the expert of the London Paper Makers' Association, has declared as the result to his experiment that mana grass offers a more than efficient substitute for wheat straw; that it is, in fact, owing to its containing less of the silicate which is so potent a factor in producing brittleness, much more suited to the manufacture of the boards required than is the last-mentioned material. One has only to handle the specimen of the outturn to Dr. Evans's experiment to realize how far more flexible and homogeneous it is than anything we have yet seen produced from straw. Further trials, we are told, are to be made by Dr. Evans, and if these result in confirming first impressions and an official report to that effect is made by their conductor, it will be determined upon—contingently of course upon a favourable opinion being expressed as to the general suitability of the new tea chest to the needs of our tea planters—to establish factories for the manufacture of the board both at Galle and Nawalapitiya; the first to undertake the working up of the waste from the citronella oil mills, and the second that of the mana grass which is to be found in such abundance in its neighbourhood.

We shall naturally be well-disposed to welcome the establishment among us of these two new factories, with, we should presume, their included industry of the making up of tea chests of the

material they are to furnish. All work of the sort contemplated requires the employment of great power. This could doubtless be obtained very economically by the use of the almost unlimited water power which can certainly be obtained in the neighbourhood of Nawalapitiya, and possibly also near to Galle. Mr. Stanley assured our correspondent that, given favourable results to the two experiments now proceeding, all arrangements were well forward to start the industry in this island, and we therefore look forward with very great interest to receiving the subsequent report which will doubtless soon be forwarded to us. It appears that the present cost of carriage of each box from London to Ceylon is sixpence, and therefore on this item alone a very considerable saving will be effected if the chests can be locally produced. But it is confidently anticipated, that beside that economy, a further one of very considerable amount will attend the local production of the strawboard This has hitherto been obtained from Holland, but experts consider it to be of imperfect manufacture, and it is besides relatively too expensive. The change contemplated will therefore, if carried out, probably render it possible for the chests to be supplied at a cost considerably below that of the wooden boxes at present used.

We have referred above to what is termed the imperfect manufacture of the strawboard at present used. We are told that in order to obtain the required stoutness—*i.e.* thickness—of board several layers of the straw paper have to be pasted together. It is presumed that the siliceous character of the straw used opposes itself to the production of thick material. This difficulty, it is said, will not present itself in the case of manufacture from mana grass, and that, given sufficient power, it will be possible to make from it board of almost any required thickness. Although as yet the prospect of this new industry being established among us is still subject to conditions which may possibly not be fulfilled, there certainly appears to be very strong ground for hoping that before very long we may be able to welcome its advent.

It will certainly be a remarkable change, if the tall, course, lemon-scented grass which covers so large a portion of our upland prairies, instead of being burnt periodically to obtain cattle feed in the shape of the young tender shoots, should be cared for, cultivated and utilized for an interesting and profitable manufacture.

HOME CRITICS ON CEYLON TEA: OVERFIRING AND FERMENTATION. TEA CHESTS.

Having asked Mr. F. F. Street's opinion on this subject he is good enough to write as follows:—

"In regard to the firing of tea, of course you allude to Messrs. I. A. Rucker & Bencraft's recent circular on this subject. I can only say that I entirely agree with their remarks as far as the fermentation and firing of Ceylon teas is concerned. My estate reports during the past five years would give you ample evidence that what they assert is perfectly true, and they confirm what I have repeatedly written on the subject during that period. During the past six months alone I may mention that I have reported on something like 1,200 estate samples, so that I have had ample opportunities of judging. This does not, of course, include teas that have come under my notice in other ways, and as a buyer and seller of tea on this market, I am perfectly convinced in my own mind that insufficient fermentation and overfiring in a great measure, if not entirely, account for the non-keeping properties of Ceylon teas—of which we have heard so many complaints. I am however glad to say that the number of cases of overfired teas coming under my notice in the way of business are much less numerous than they were—this is largely due to the firing now being done at a lower temperature than formerly, especially the final-firing—which in most cases is where the damage is done. It appears to me that tea is exactly on a par with any other article of food that requires roasting before it is fit for consumption : it may and often is cooked to such a point of dryness that the sap or juices are more or less burnt out of it, leaving a dry juiceless article, deprived of all its quality and goodness. It is a noteworthy fact that under or short fired teas are invariably full and generally pure in the cup, while overfired teas are always more or less impure, thin or comparatively so ; clearly proving that the additional firing has dissipated some of the juices of the leaf that would have remained in the leaf with slower and lower firing.

"*Tea Chests.*—I have not the smallest doubt that the 'cheesy' flavour complained of from home, originated from the use of some unseasoned and unsuitable Ceylon wood. Some two or three years ago I had some shelves put up in my office made of a cheap Ceylon unseasoned wood, the smell was perfectly offensive (I can only liken it to 'rotten game'), and made it most unpleasant to sit in the same room.

"Japanese 'Momi' are undoubtedly the best packages we have, being free from smell, light of weight and for make and finish rarely equalled in Ceylon-made packages."

We can understand underfermenting leading to absorption of moisture, but how over-firing can lead to such a result, we find it difficult to conceive.

MAURITIUS HEMP MACHINES.

(From the *Kew Bulletin.*)

The subject of Mauritius hemp has been discussed already in the *Kew Bulletin* (March 1887, p. 8). Since that time considerable interest has been taken in India and the Colonies in the production of fibres suitable for rope and twine making, for which of late years there has been a considerable demand. In connexion with this interest numerous inquiries have been addressed to Kew respecting the best machines for cleaning the leaves and stems of plants yielding such fibres. The plants in most cases have been various species of *Agave*, *Furcræa*, *Sansevieria*, *Karatas*, *Bromelia*, and other monocotyledonous plants whose fibre bundles yield the particular kind of fibre in demand.

It is well known that certain fibre machines, more or less effective, are in use in Yucatan in the production of Sisal hemp, yielded by one or more varieties of *Agave rigida.* It is very probable that some of these machines could be successfully introduced into other countries where Agave plants are grown for fibre [*see* Kew Bulletin, March 1887, pp. 3-8; March 1889, pp. 57-61; and October 1889, p. 254].

In the case of Mauritius hemp we learn that the fibre machines, locally known as *grattes* or scrapers, which have been generally in use in that island for many years, are manufactured in the Colony. These are exclusively engaged in extracting fibre from the leaves by the *Aloès vert* or fœtid Aloe (*Furcræa gigantea*). The leaves of this plant are very similar in size and character to those of *Agave rigida* var. *Sisalana* received lately at Kew from the Bahamas. There is little doubt that the *grattes* or fibre machines as now used in Mauritius, or with some slight modifications, could also be used in the treatment of Agave leaves. In any case it was very desirable to obtain exact particulars of

the constrnction and capabilities of the Mauritius machines. They appear, so far, to fully meet the requirements of the Mauritius planters, and moreover, they have been adopted after careful trial with other machines which have been ultimately discarded. The particulars desired in regard to the machines in use have now been furnished in an exhaustive manner by the Government of Mauritius, and they are published in the *Kew Bulletin* with the view of placing the information within reach of a large class of people interested in the subject.

* * * *

Answers to queries respecting machines in use at Mauritius for extracting fibres from leaves of *Furcræa gigantea.*

1. The machine in general use in this Colony is a drum of 2 feet in diameter by 1 foot in width, upon which are bolted blades in 2-inch L steel, and which revolves at a great speed, the blades passing close to a guide in cast iron ("servante.") The machine is called a ("gratte") scraper. It is manufactured in the Colony by all engineers' shops, but chiefly by the "Forges and Fonderies de Maurice."

2. The weight of the drum is about 4 cwt., the cost, including the driving pulley and belts (exclusive of framework, masonry, and setting,) is about R250 per "gratte."

3. This gratte has been in general use in Mauritius for the last six years.

4. The machine is worked by steam or by water power.

5. The registered horse-power to drive one gratte is 3 h.p.

6. One gratte is served by two men who stand on each side of the gratte, and who work alternately. One of them must be left-handed. One carrier will bring in sufficient leaves from the yard to the gratte, and another man will suffice to remove the wet fibre produced by two grattes and to carry this fibre to the weighing machine and thence to the cleaning pits.

7. The out-turn of wet fibre for each machine per hour is, on an average, 42½ kileg., that is taking eight hours' work per day, which is as much as the men can do, the work being very fatiguing.

8. The out-turn per day of eight hours is per machine (gratte) 340 kil. wet supplying on an average 97 kil. of dry fibre (or 28½ per cent of the wet fibre.)

9. The average cost in labeur, fuel, &c. in cleaning a ten of dry fibre, packing, and transporting to the place of shipment is ...	R 150
If to the above we add other charges, viz., collecting leaves, carting, mill management, interest on capital, &c., say about	75
The total average cost of one ton of fibre ready for shipment is	R225

(Signed) A. VANDERMEERSCH,
Acting Surveyor-Genl.

17th February 1890.

SUMMARY OF A NOTE ON THE FIBRE MACHINES GENERALLY IN USE AT MAURITIUS FOR ALOE CLEANING FIBRE, BY M. REGIS DE CHAZAL.

1. *Description of Machine.*—The machine generally in use in Mauritius for extracting fibre from the leaves of the green Aloe *Furcræa gigantea*) is known under the name of *gratte.* This gratte consists of a drum about 2 feet in diameter and 1 foot wide. On the circumference of this are bolted 2-inch L-shaped blades parallel to the axis. These blades are generally of iron, but steel is preferred. They are firmly fixed to the drum by means of bolts and nuts. The drum is mounted upon an axle and made to revolve with great rapidity close to and against the front or edge of a feed table (*servante*). The feed table is adjusted by means of screws so as to approach the revolving drum within a distance of quarter inch to an inch, as required. It is composed of a stout brass plate and lip fitted firmly to a piece of hard wood by means of bolt. The plate and wood are themselves fixed to two wooden bars, 6 inches by 6 inches, which serves as guides in the movement of the feed table backwards and forwards.

The most difficult task in connexion with working the gratte is the exact adjustment of this feed table. It is most necessary that the blades on the drum and the edge of the feed table are so adjusted that they work freely and evenly and at the same time bring every fibre in the leaf in contact with the beaters. The proper adjustment of the feed table in regard to the beaters is stated to be the secret of the success of the *gratte* as a fibre machine. This adjustment should be performed with the utmost care before the machine is started. When once adjusted it is important to maintain the feed table in its proper position and prevent any displacement during the process of working.

The drum should be turned at an average rate of 700 revolutions per minute, while a higher rate of speed may be maintained without injury, it is found not desirable under any circumstances to fall below 620 revolutions per minute. The best and most economical work is that done at 700 revolutions per minute.

Method of Working.—The Aloe leaf is presented tip first along the feed table, and is drawn down between the latter and the drum. It is thoroughly beaten by the grattes to about three-fourths of its length. By these means the pulp is removed and the fibre is left. The leaf is then withdrawn and the other end presented to the beaters until the whole is cleaned.

Two men usually work at each machine. They stand one on each side of the feed tablo and work alternately. It is desirable for rapid work that one of the men should be left-handed. Each man in turn presents his leaf to the machine and withdraws it as soon as possible. In a regular and efficient working of the machine it is arranged that one man or the other should always have a leaf in the machine in course of being cleaned. To avoid accidents the feed table is now provided with a wooden guard. This guard prevents the hands of the workpeople from being caught by the beaters.

Mounting the Machines.—The machines are generally mounted in pairs both working on the same axle, and driven by steam or water power. The driving wheel fixed midway on the axle between the two machines should have a minimum diameter of 18 inches, with a strap 6 inches wide. A single adjustment of the feed table should last from eight to 15 days. At the end of that time it is generally found necessary to readjust the parts to ensure good results.

The framework of the machine is securely attached to substantial masonary work by large bolts about 5 feet long. The machines must be thus firmly secured or the vibration during the process of working would soon cause them to be come detached. The arrangement of the machines in pairs on the same axle could be extended in the same line indefinitely, provided the necessary distance is preserved between the centre of each machine. One of the largest fibre factories in Mauritius contains 12 machines, that is six pairs arranged as already described.

Out-turn of Fibre.—As already stated each machine is served by two men standing on each side of the feed table. One carrier supplies them with fresh leaves while another is engaged in receiving and removing the wet fibre. The task of a man, which can be easily accomplished in six to eight hours, is 250 lb. (or 125 kilos of wet fibre). The wage paid for this is one rupee. Sometimes, however, by extra work (for which the werkman is paid at the rate of 50 cents per 100 lb). as much as 800 to 900 lb. of wet fibre have been produced in a single day. This amount amount, however, is quite exceptional.

The proportion of dry fibre to the wet fibre as it leaves the machine varies from 22 to 30 per cent.

The yield of dry fibre in relatien to the weight of green leaves varies according to the age of leaves and the characteristics of the season. The riper the leaves tho larger the yield of fibre; a wet season producing leaves charged with moisture will also affect the result. To produce a ton of dry fibre ready for shipment requires from 80,000 to 150,000 leaves, varying according to the size and age of the leaves and character of the season. The cutting of the leaves costs from 50 cents to one rupee tho 100 bundles of 25 leaves each. The higher price is paid when labour is scare, or when the

ground is rough and difficult to traverse. The cost of baling the dry fibre costs from 40 to 50 cents the bale of 150 kilos. It may be assumed that a set of 10 to 12 fibre machines properly installed and attended by men accustomed to the work will turn out on an average about 1,200 kilos (2,645 lb. avoir.) of dry fibre per day.

Difficulty is sometimes experienced in obtaining pairs of right-handed and left-handed men for each machine. Right-handed men are, as may be expected, in excess. As already shown, it is necessary for economical working to have a right-handed and a left-handed man to attend to each machine.

Treatment of the Fibre.—When the fibre first leaves the scraping machine it is covered with mucilage possessing corrosive properties which dries on exposure to the air. The tendency of this mucilage, if left on the fibre, is to turn it of a yellow colour, and even sometimes of a reddish colour. To prepare the fibre with a bright attractive appearance the best plan is to place it, as soon as it leaves the machine (or as soon as it has been weighed, to check the amount produced by each man), in warm water of a temperature of 60 deg. to 80 deg. Cent. (140 deg. to 170 deg. Fah.), and leave it there for about two hours. It should then be washed in two waters, and finally exposed to the sun to be dried.

A treatment recently employed consists in washing the fibre in cold water only. In the first washing soap is used at the rate of 2 to 3 per cent. of the wet fibre. After being thoroughly washed with soap the fibre is passed through pure water until all the soap has disappeared, then exposed to the sun and dried. By these means a beautifully white fibre is obtained. When thoroughly dried the fibre is afterwards scutched, to get rid of pith and dust. This process is usually performed by a machine constructed on the plan of an ordinary *gratte*, but fitted with four blades instead of 12. These also turn away from the feed table instead of towards it. The fibre is inserted at an opening about 6 inches higher than the centre of the axle. It is carried away by the movement of the beaters, and remains on the top of the drum, where, exposed to the repeated blows of the beaters, it is cleaned of all dust and impurities.

It may be mentioned that, owing to the corrosive nature of the juice of the Aloe leaves, the workpeople are compelled to wear strong leather gloves. The gloves are fastened to the wrist by leather bands. As the gloves are provided by the proprietor, and they wear out very quickly, they constitute quite an appreciable item in the cost of working a fibre factory.

ADDENDA.—The upper half of the gratte is covered with a semicircular wooden cover, to prevent the "pulpe" from being splashed about the place; this "pulpe," which is semi-liquid, falls on an inclined plane standing about 1 foot below the gratte, and upon which it slides into troughs, wherefrom it is gradually removed and spread to dry.

There is a considerable quantity of this "pulpe" produce for one ton of dry fibre (about 20 tons), and large areas are required to stack it. The smell from the decomposing "pipe" is anything but agreeable.

During the first years of Aloe fibre manufacture in Mauritius no use was made of the residue ("pulpe"), as it was found to burn the plantations when used as manure. Of late, however, it has been extensively employed by mixing it with other manure, and it has given good results in the cane fields.

(Signed) A. VANDERMEERSCH, Acting Surveyor-General.
February 17th, 1890.

STATEMENT of WORK executed at ST. ANTOINE HEMP FACTORY, in District of RIVER DU REMPART, MAURITIUS.

Year 1889.

February ...	15 days' work	with	9 grattes.
March ...	18	,,	11 ,,
May ...	20	,,	11 ,,
June ...	7	,,	11 ,,
	60 days.		

Equivalent to 630 days' work of one gratte.

The produce has been 213,371 kilos. of wet fibre, which have given—

401 bales of dry fibre, 1st quality.
6 ,, coarse fibre, inferior quality.

407 bales, weighing 61,050 kilos.

Mean day's work = 10,175 kilos.
Proportion of dry fibre to wet fibre = 28·61 per cent.

A true copy of note supplied by Manager. (Signed) A. VANDERMEERSCH, Acting Surveyor-General.
17th February 1890.

BRAZIL AND THE RUBBER TRADE.

"So the swooping down of the new Republican Government upon the rubber exporters at Para, has given the trade rather a twinge," said one of our representatives to a leading London importer the other day. The air was redolent of rubber, and before our reporter had had time fully to enjoy the flavour, the broker answered:

"No; say rather a spasm. But it is all over now. The Central Government at Rio has stopped the action of the Provincial authority which gave the monopoly to the Companhia Mercantil."

"You did not have to wait for the memorial to Lord Salisbury to take effect. Diplomacy is at the service of the City. Fifty or sixty firms importing yearly 6000 tons of rubber from Brazil always have ambassadors and ministers plenipotentiary at their beck and call."

"No doubt the Government would have acted in the question. But it is not necessary now. The French claim the credit for the abolition of the monopoly. That really does not matter. What we feared was that the new movement would not stop at caoutchouc. It might have treated coffee in the same way."

"Still, prices have been affected but very slightly by the monopoly."

"That is so. But the principle of the Republican Government's action was most unfair. All exporting houses in Para were compelled to pay a large percentage to one company, which in its turn was favoured with the monopoly by paying a very small tax per pound on exports. One of our chief complaints was that the additional taxation was payable not to the Government but to a private trading corporation which competed with the payers of the tax in the rubber trade. It was not business. It was sheer barbarism."

"So the new Government has not made a good impression!"

"No; but it has been taught a lesson, and may be expected to do better in future. It will reflect before it attacks the mercantile interest again."—*British Trade Journal.*

CONCRETE QUARTERS FOR NATIVE CLERKS, GUARDS, AND MENIAL STAFF ON INDIAN RAILWAYS, ETC.

BY T. KER, M. INST. C. E.,
Executive Engineer, P. W. D.

The excessive cost of housing the Native Staff, owing to the necessarily, and by comparison with European Railways, large number of native employés required, has long occupied the serious consideration of Railway Administrations in India. The above difficulty, in effect, has led to temporary structures being resorted to in many instances, the repairs to which, every monsoon, cost in a few years more than permanent quarters could be erected for.

The author having had some experience in the designing and construction of various descriptions of dwelling houses in India, has, with the object of meeting the exigencies of the case, designed, a class of quarters suitable for native clerks, guards, platelayers, pointsmen, gatemen, &c., the lower state generally, for which he claims the following advantages:—

1. The quarters being built of concrete throughout, walls and arched roof, can be erected almost anywhere.
2 The materials, lime, sand, broken stone, or brick or kunkur, are nearly everywhere procurable locally.
3. Very little skilled labour is necessary.
4. The cost is one-half that at present paid for the same area of stone or brick-built accommodation.
The quarters are water-tight and, if properly constructed, should never require repairs; those erected some years ago having withstood every test. The natives prefer the above, as being cooler than stone-built houses.
The style of construction adopted is specially suited to the natives, who are accustomed to light work, progressing by easy stages; it has also this advantage that, with the usually scanty supervision available in India, the due inspection of each course laid, is rendered possible, less opportunity of inferior materials being passed and a better guarantee secured that the work will be substantially carried out, than would result if European methods were pursued.—*Indian Engineer*.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, June 5th.

CINCHONA.—The auctions held here on Tuesday were the smallest which have taken place for many months, the total weight of the bark offered being less than two-fifths of what is announced for sale in Amsterdam on Thursday. The assortment of bark offered was rather a good one, one or two catalogues offering several very handsome parcels. The tone prevailing at the auctions was a very strong one indeed, and though it cannot be said that there was any actual alteration in value, the lots sold were well competed for, and holders showed no inclination to accept lower rates.

The following was the assortment offered:—

	Packages.		Packages.	
Ceylon bark	...562	of which	...243	were sold
East Indian bark	...312	,,	292	,,
Java ,,	... 11	,,	11	,,
South American bark	...634	,,	122	,,
Total	...1,519	,,	668	,,

The unit is generally placed at 1⅝d to 1¾d per lb.

The following were the principal buyers:—

	Lbs.
Agents for the American, French, &c., works	...28,314
,, the Brunswick works	...19,819
,, the Frankfort o/M. and Stuttgart works	...11,580
,, the Auerbach factory	...14,390
Mr. Thomas Whiffen	...18,410
Agents for the Mannheim and Amsterdam works	...22,215
Messrs. Howards & Sons	...26,109
Sundry druggists	... 2,560
Total amount of bark sold	...153,397
Bought in or withdrawn	...276,000
Total quantity of bark offered	...429,397

It should be well understood that the mere weight of bark purchased affords no guide whatever to the quinine yield represented by it, firms who buy a small quantity of bark by weight frequently taking the richest lots, and *vice versa*. Analysis of the catalogues gives the following prices for sound bark:—

CEYLON BARK.—Original.—Red varieties: Fair to good quilly chips 2d to 3d; rather dusty, but bright shavings 3½d; bold and dusty mixed root 2½d to 3d per lb. Yellow varieties: Good bold quilly chips 7d to 8½d; small branchy chips 5d; bright, but dusty mixed chips and shavings 7d; dull, but rich root 7½d to 9½d; low pale quillings 3d per lb. Small and dull grey chips 2½d to 3d; dusty to bold root 4½d to 7d per lb. Hybrid chips, small and dusty to good strong 3½d to 6d per lb. Renewed.—Red varieties: Sall woody chips 3d to 4d; good bright and mixed with small quill 4½d to 6d; fine bright shavings 7d per lb. Grey: Good chips 6d to 7½d; fine bold bright quilly ditto 8½d to 9d per lb. Hybrid chips 5d to 7½d per lb.

EAST INDIAN BARK.—Orgnl.—Red varieties: Small to fair quilly mixed chips 2¼d to 3d; fair bright shavings 3½d; dull weak branch 1¾d; dusty root 2½d per lb. Yellow chips, dull and small 3½d to 4½d; good bold bright ditto 5d to 6d; good bright quilly shavings 5d per lb. Grey quilly chips 4½d to 5d per lb. Hybrid chips 4½d to 5d; fine bright shavings 6½d per lb. Renewed.—Red varieties: Small and dull to fair quilly stem chips 3½d to 5½d; good bright, but small shavings 5½d per lb. Yellow chips good quilly to fine bright strong 6½d to 10d per lb.

SOUTH AMERICAN BARK.—Of 32,336 lb. cultivated Bolivian Calisaya 12,110 lb. sold; good strong brown and grey quill 9½d; medium ditto 7d to 7½d per lb. A parcel of 34 serons old dull dusty Pitayo sold at 3½d per lb., and of 321 packages Cuprea 47 bales imported in 1883, sold at 2½d per lb., the remainder being held for 3d to 4d per lb. The imports here are rather heavy, 1,316 packages having been entered from all quarters since our last report. We understand that over 200 packages bought in at Tuesday's auctions have since changed hands at full prices.

QUININE.—The speculative business has continued during the early part of this week on a moderate scale, about 50,000 oz. B & S and Brunswick bulk, first-hand changing hands at 1s 1¾d for November-December, and 1s 1¾d per oz. for August-September delivery. The A & S agents now say that they do not care to sell any more, and quote 1s 2d per oz. nominally. Meanwhile the market has become inactive, and the position today is about as follows:—Spot: Buyers 12¾d; sellers, 13d; August-September, buyers, 13d; sellers, 13¼d; November-December buyers, 13¼d; sellers, 13½d per oz.; no business.

THE AMSTERDAM CINCHONA AUCTIONS.

(*Telegram from our Correspondent.*)

At today's auction 3,082 packages were offered for sale, and these were all disposed of with the exception of 5 packages. Holders offered freely, and the result of the heavy quantity thus pressed upon the market was a decline of fully 10 per cent as compared with the previous Amsterdam sales, and some slight fall on the last London prices. The average unit value was fully 8 cents per half-kilo, or a fraction below 1½d per lb. The following prices were realised: manufacturing barks in quils, entire and broken, and in chips, from 4 to 78 cents (= ⅝d to 1s 2d per lb.); manufacturing root 11 to 64 cents (= 2d to 11¾d per lb.) Druggists' barks, chips and quills, broken and whole, 11 to 78 cents (= 2d to 1s 2d per lb.); ditto, root, 12 to 25 cents (= 2d to 4½d per lb.) The principal buyers, in order of their purchases, were Messrs. Mathes & Bormeester, of Amsterdam; Messrs. O. L. Schepp & Zonen, Rotterdam; the Auerbach Quinine Works and the Amsterdam Factory.

In addition to the analyses of the bark offered today, already given in last week's issue, the remaining 48 tons of bark were found to contain about 2 tons sulphate of quinine, so that the whole quantity of manufacturing bark offered today, viz., about 246 tons, contained about 335,000 oz. sulphate of quinine, or about 4 percent of the average.

ARTIFICIAL GUTTA-PERCHA.—We are informed by Dr. Purcell Taylor that he has succeeded in making a new insulating material, having all the properties of gutta-percha. The new substance is very tough and elastic. A piece of iron covered with this "Purcellite" was, he states, hammered out flat, then bent and twisted until it broke, without even cracking the covering. The cost is said to be considerably less than that of gutta-percha.—*Electrician.*

THE CULTIVATION OF CINCHONA IN SOUTHERN INDIA.

We call attention to Baron von Rosenberg's long, racy and practically interesting letter addressed to the "Editor of the *Tropical Agriculturist*" given in another column. We have not seen a copy of Mr. Lawson's report, which our correspondent so trenchantly and so ably criticizes; but before reading this letter we had written a note on the reference to Mr. Lawson's starvation theory in the report of the Wynaad Planters' Association, to this effect: "Surely stiff, damp, clayey, soil is a largely operatively cause?" In our own experience, which has been extensive, we have traced canker in cinchonas to soil mechanically hard more than to any other source. The taproot of cinchona cannot pierce soil in such a condition, but curls round in the pit, and such roots we have found covered with liverworts. Through similar soil the much hardier tea plant forces, its robust taproot, to a depth of many feet, and we have frequently mentioned that in land thus opened up and drained by tea we have thriving (for the tea far too luxuriant) groves of cinchonas. If, therefore, it were commercially worth while to continue to cultivate cinchonas in Ceylon, we should advise putting the plants out amongst tea at least four years old. Even so, no doubt, many of the plants would gradually canker and die, as in the case of cacao, the zone for cinchonas seems limited, and amongst all that is worthy of attention in Baron von Rosenberg's remarks, and that is the whole of his utterances, we attach special importance to his advice that cinchonas should not be planted under 5,000 feet elevation. But if any new plantations are to be formed in Ceylon at and above that elevation it must be on grass-land, for the Ceylon Government will not, now, sell forest land above 5,000 feet altitude, lest, forsooth, the rainfall (dependent upon monsoon winds and mountain masses) should be diminished by forest clearing! All the clearing as yet effected has not diminished the rainfall a thousandth of in inch.

PLANTING IN THE SOUTH PACIFIC.

We have a letter from a New Zealand mercantile house inquiring about planting requisites in various forms, and from their manager—an old Ceylon planter—resident on an out-of-the-way island of the Pacific, who writes:—"I have recently arrived here on behalf of the firm of ——— to look after their coffee plantations. The island is a very small one and grows coffee luxuriantly, but it is almost all old and, like the native coffee of Ceylon, never touched by pruning knife. The firm is about to put some land under coffee after the Ceylon method of cultivation. I think of introducing some other products here which I think ought to succeed,—cacao, Liberian coffee, cardamoms and pepper. I should like also to introduce the jak tree."

TIMBER FOR MINE PROPS.

In view of the probability that large demands on our forest resources may ere long be made by gemming and plumbago companies in the shape of props for mines, the following details from the *Indian Engineer*, of experience in coal pits at Warora, may be interesting and useful:—

All the timber used is in the shape of props cut in the Government preserved forests, near Chanda, about 30 miles south from Warora. Timber in India is very expensive; teakwood costs 3½ rupees a cubic foot, and is the only timber available for ordinary work. Before 1883 very few props were used, and it was only on the introduction of a regular system of working and commencing the broken mine that the getting of timber on a large scale was gone into. In January 1884, the Government Forest Department sent six sorts of timber, in the shape of props, for trial, the principal variety being Garrari (Lepidopteris orbicularis), of which the props upto that time had been. The others were Thendu (Diospyros melanoxylon), Dhaora (Anogeissus latifolia), Mohka (Schrebera Swietenoides), Aouli (Phyllanthus emblica), and Seena (Lagerstroemia pariflora). Of these, Garrari was given up later, after trials with it in the pit; its wood is too fibrous, and it was found too flexible, and very often hollow. Thendu was found to be the best; it has as heart wood, ebony, and was found to answer well as a prop in the broken. Dhaora was found to be the next best, but its curious structure, in which the fibres looked like the twist of the strands in a hemp rope, made it less fit to stand pressure. Mohka was found to be a fair timber, while Aouli and Seena was pronounced bad. Unfortunately a large number of Garrari props had already been ordered, and they became of use by being split and used as lagging; Garrari is also more plentiful than other timber, being a quick growing tree. After this, two sorts only were ordered—Thendu and Dhaora with a little Garrari. Then the Forest Department complained that at the rate of consumption, the timber preferred could not be supplied without endangering the existence of the plantations, and asked that some other kinds of timber be tried for pit props and accordingly, a further assortment came and were tried. They were:—1.—Rohan (Soymida febrifuge). 2.—Saj (Terminalia tomentosa); locally known as Ain or iron wood. 3.—Mohka (Schrebera swietenoides). 4.—Suria (Xyla dolabriformis). 5.—Bahera (Terminalia bellerica), 6.—Kahu or Argun (Terminalia arjuna); rather rare. 7.—Kini (Albizzia procera). 8.—Bhirra (Swietenia chloroxylon). 9.—Chichwa (Albizzia odoratissima); not recommended by the Forest Department for pit work. 10.—Mohwa (Bassia latifolia), not recommended by the Forest Department for pit work. Of all these specimens, Saj was the only additional timber recognized as good for mining, and accordingly from that date (1886), two sorts of props only were indented for Thendu and Saj. In 1888 the Forest Department complained again that if the colliery would still insist on being supplied only with two sorts of timber in such large quantities—about 5,000 props per annum, from 8 feet to 14 feet long, by 8 inches to 12 inches in diameter—they would be unable to keep up the supply, and again asked that other timber should be tried, and in November, 1888, eight samples were sent, of which three had already been tried, the others being—Bhirra or satinwood (Chloroxylon Swietnia), Kate or Kase i (Briedelis retusa), Hiwar or Kinj (Acacia eucophlea), Siras (Albizzia lebbak), Keni or Gorarh (Albizzia procera,) and here the question stands. There is no doubt that the panel system of working, and the careful seeing to that no more than 8 feet of coal is worked in the whole mine, and the galleries kept their ordered width, and the narrowing of the boards of the headways, will still reduce the cost of timber per ton, especially when the broken is commenced in the large 60 feet pillars. The cost could be brought down to 1½as. or 1¼as. per ton. The timber for props should be cut in or before the rains, and after barking, allowed to lie two or three months in the jungle.

THE CHINA TEA TRADE.

The *Shen Pao* attributes the decline in the Tea Trade to the following causes. First foreign competition and secondly, the machine-made tea of India and Ceylon besides being nearer to the tea-consuming countries, cost far less to produce than China tea. Several large hongs engaged in the tea trade lost heavily on last year's crop, but for all that there were in Kiukiang alone, something like 33 hongs engaged in the trade on the year's first crop, no doubt with varied luck,

But in the second crop there were only 6 or 7 hongs engaged. The question is why is there this great dropping off in the second crop. The answer is to be found in the above reasons. But there is still another, and the greatest reason of all. It is the heavy duties levied by the Government on the article. The dealers are compelled by the enormous taxation to abandon the trade. Formerly when a picul of tea cost Tls. 50 or so, the duty was fixed at Tls. 5; but in consequence of the lowering of prices a picul of tea of the ordinary kind costs only Tls. 8 or 9, and of course on this the traders cannot afford to pay a duty of Tls. 5. There is no proportionate lowering of the duty with the lowering of prices, and unless the authorities take timely measures to redress this, the trade that has for so many centuries been the staple of China will be utterly ruined.

It is rumoured that on her last trip the *Whaon* carried a lot of fire bricks and all the necessary plant of tea manufacturing machinery destined for Kiukiang. It is to be hoped that by this the Chinese may be enabled to compete in the trade with other nations.—*China Mail*. June 12th.

PLANTING IN FIJI.

Alpha, Fiji, May 15th.

We escaped a blow this past season, for which everyone is thankful and feels more hopeful for the future. The plantations, coconut, have not yet recovered from the disastrous effects of the 1889 hurricane, and it will take some 2 or 3 years more ere they will give any return to speak of and even then they will not give the crops they used, as such a large percentage of the trees have died. The Colonial Sugar Co. are talking of putting up a mill in Vanua Levu on the Labasa. They have been taking levels of and surveying the land. Most probably they will first try 100 acres of cane, and if it grows and turns out well then launch out further. That old Ceylon planter Cottam has been up this way and spent some time with me. The country was not go-ahead enough for him, so he has cleared out to New Zealand.

Tea is looking A 1, but the crop has not been up to expectation on account of incessant rain for 5 months. I am hoping for better things this season. Prices of tea in the Colonies are very poor. Lanyon, an old Ceylon man, has gone to Sumatra to try and learn all about tobacco. He will return here, *i. e.* Fiji, to show us all how to do it. The colony grows good tobacco, but no one knows the secret of curing. Coolies can now be got for about £18 to £19 from India instead of costing £25 as formerly. The introduction of Polynesians is still heavy, £15. The Government is now prepared I hear to lease out land at a cheap rate and for lengthened periods. I am in a hurry to catch the mail, so must defer writing to you more fully on the labour and land questions till some other time. Wishing the Old Colony all prosperity.

A. J. S.

THE JAVA TRADE.

Though Java grows rice, tho quantity raised does not meet home consumption, and yearly importations, more or less considerable, have to supplement local crops. The importation of petroleum has increased five-fold within the last fifteen years in Netherlands India. There, the average consumption per head of the population comes to four times the percentage in British India. The extension of steaminnavigation and railways of late years takes effect in steadily arger arrivals of coals from foreign lands. The export of sugar has fallen off a good deal. The coffee totals come to 370.000 piculs, which compare favourably with those for 1888. The figures for indigo mark steady and growing increase, a feature common to few Java export articles. It has doubled within the last twelve years, and commands so much favour that many planters put that staple above sugar. The exports of tobacco remain stationary owing to the low prices ruling in Holland, and very little of the article finds its way to Singapore. Hides present the same state of matters but nutmegs and mace show a decline, hardly any being grown in Java. The same may be said of pepper, the quantities figuring in the trade returns coming for the most part from the Lampong districts, where its cultivation is a leading industry among the people. Jungle produce makes little show, gum dammar lessening in importance. and india rubber and gutta percha steadily figuring less and less. The yield of tea grows slowly compared with the leaps and bounds characterising its production in Ceylon and India. Cinchona shows more than 40 per cent increase, and kapok compares favourably with the figures in the returns of ten years ago. Decrease is noted under the head of rattans but the article comes from Sumatra and Borneo, Java itself being a non-producer. As will have been seen Java still holds a commanding position in the market, and may be trusted to recover ground when the times mend.—*Straits Times*, June 11th.

MAANA AND CITRONELLA GRASS FOR STRAWBOARD—TEA CHESTS—FIBRES.

A good deal was written you in my last letter about the prospect of successfully substituting mana grass and citronella stalks for the straw which is now worked up into strawboard, and the possibility arising from that prospect of the establishment of factories in Ceylon to give effect to it. Since writing you to that effect Dr. Evans and Dr. Wirtz have conjointly sent in a report upon further experiments conducted by them which opportunity has been afforded me to read. Analysing this report, it appears that when boiled under pressure with water alone mana grass yields about 50 per cent of fibre; but as of course these experiments have been made with grass that has parted with nearly all its moisture during its conveyance to this country, this percentage would not represent the proportion that could be obtained from the grass gathered wet for local manufacture. The addition of certain proportions of lime during the boiling process appears to have been possessed of but little value; while an experimental admixture of soda, made with the view of bleaching the outturn, proved to have the effect of seriously diminishing the amount of pulp obtained from any given weight of the grass.

Summing up the results to these experiments, the experts above-mentioned give it as their opinion that the grass is "well suited" for making into millboard, but that it would be useless for white papers from the fact that the admixture of soda above referred to largely diminishes the amount of pulp obtained, and that the material is, under other conditions, exceedingly difficult to bleach. However, what it was desired to ascertain has been definitely confirmed by this report,—viz. that in the mana grass—as probably in many other of your fibrous plants and grasses—Ceylon is possessed of admirable and abundant material for coarse paper making.

You will naturally be desirous to hear what result this report may be expected to lead up to. As yet, and until the success of the shipment of the Stanley-Wrightson tea chests to Ceylon has been confirmed, it is impossible for anything definite to be decided upon. But so far as discussion has at present proceeded, it would seem as if the syndicate manufacturing these chests was desirous of erecting a small factory here with the object of working up mana grass to be imported from Ceylon, before undertaking the establishment of manufactories in that island. Certainly, should that undertaking establish the value of the new substitute, it must ultimately find location in the land of natural produc

tion, but the undertakers will probably do wisely to restrict their first attempts to such as may be conducted under their own immediate supervision. To carry out this scheme the existing syndicate must form an allied company, and as to this we should say there would not be any difficulty experienced. But the whole matter must be held to be in suspense until it is pronounced whether or no the new chests can successfully supersede those of wood.

It caused me surprise to hear this week that the reply to the foregoing question is to be expected rather from the home traders in tea than from your planters. The verdict is dependent upon the opinion expressed on *this* side as to how the teas shipped in the new boxes have arrived in this country. It is not likely this verdict will now be long deferred, for advice of the first 200 chests shipped has already been received. Of course, as I told you, experimental chests have before been received from the Mariawatte estate, the contents of which were delivered in perfect order and with the boxes themselves as sound as when sent out from the home makers to Ceylon. If equally satisfactory results are obtained with the first shipment made on any extensive scale, you may expect to see all the anticipations I have mentioned to you realized before long. The opinion hoped for has been somewhat strongly anticipated by a London firm of tea dealers, which was so pleased with the boxes that it purchased the first 400 obtainable for rebulking and distribution to the retailers throughout the country. This purchase certainly justifies to a large extent the very confident hopes felt by the members of the Syndicate.

The specimens of the grassboard forwarded to you with my last letter had not, you must bear in mind, been subjected to pressure. When that has been applied, as it is to all millboards, by hydraulic power of an extreme character, the soft, pliable paper will become harder than wood itself. A specimen of the material made from waste newspapers was shown to me this week which was so hard that the surface could hardly be scratched. It is expected that the mana grass will yield an equally dense board, and be so superior in this respect to straw, that ⅛ inch in thickness will suffice for tea boxes instead of the ¼ inch strawboard now used. It is estimated that, whereas the latter now costs the syndicate about £6-10-0 per ton, the mana grass board will cost even when made in this country, under £5 per ton, and of course materially less when worked up on the site of its growth. The board made from old newspapers that has been mentioned is sold in London, it has been told me, at £5 per ton.

During the week the pleasure chanced to me of meeting with Mr. Charles Shand after an interval, probably, of some 25 years. It would be absurd to pretend that during that period no observable change was to be noticed in him, but if signs of increased age may be omitted, there remains but little apparent to indicate any effect from his long residence in a tropical climate. Mr. Shand tells me he had not been many days in London before he managed to catch a chill owing to riding outside of an omnibus, but he recovered quickly through the immediate use of quinine. He recognises the danger of his residing here during the winter, and proposes, if he can conclude the business for which he is paying his present visit to us, to return to Ceylon before that season commences here; having also before his view the object of releasing his son after his twelve years of work in Ceylon for a much-needed holiday and run home. I discussed with Mr. Shand the question of pulp from Ceylon fibres, a subject so cognate to the matter above discussed, and he tells me that the result of experiments made by himself was to prove that the grass or plant growing in your island which can be made to yield the largest amount of fibre is the *Yucca gloriosa*, which gives about 12 per cent of finished fibre out of the grossgrown weight. Other plants and grasses, Mr. Shand told me, would not furnish above 2 per cent. Perhaps therefore it would be as well to send some of this *Yucca gloriosa* home for trial at the new board mill when established. It may be mentioned that Mr. and Mrs. Shand, with their son and daughter-in law, are living in the Comeragh Road, West Kensington.

Tea has hitherto not afforded any food products save in the form of an infusion, but it has reached me that a patent has now been taken out for a beverage termed "Sparkling Tea." Indeed the manufacture of this has been commenced, but as yet my knowledge of it is confined to a sight of emptied bottles and the result of my smelling them three days after their contents had been drunk. Even after that interval the scent of tea was quite apparent. The new drink is said to class as one of the many so-called temperance drinks, that is to say that it is quite non-alcoholic, while it is so briskly effervescent that it is said it might delude a reformed toper into the idea that he had relapsed from his bettered principles and gone back to the days of champagne drinking. It appears that the patent has been taken out by Mr. Wrightson of St. Olave's Warehouse, who is also a co-patentee of the new tea chests. Probably opportunity will be afforded me of learning more about this "sparkling tea" before next writing, and of being able to record for your information my own tasting of and verdict upon it. We hear that it can only be produced satisfactorily from teas of a high class, those hitherto used having been of Ceylon growth.—*London Cor.*

CEYLON TEA IN 1889-90:

ANNUAL REPORT OF MESSRS. WM. JAS. & HY. THOMPSON.

We extract the portion of the Annual Report of the above well-known firm of Brokers, referring to Ceylon. They deal with the twelve months ending 31st May 1890 for India and Ceylon, corresponding to the Indian Tea Season closing in Calcutta on 30th April, which ought to be the date adopted by the Colombo Chamber of Commerce. Here is the Report on Ceylon:—

CEYLON.—The rapid progress made by this branch of the Industry is again the feature of the year. Notwithstanding temporary checks and disappointment, caused at one time by drought, at another by excessive rainfall, the estimated increase in Production has practically been realized. It has been accompanied by an almost equal increase in Consumption, to which the stimulus was imparted by the low prices ruling last summer; when quotations rose in the autumn the high standard of quality then reached kept the movement going, which has been steadily maintained ever since.

A noticeable modification in the scale of values has occurred, not in the average result, but in the direction of a narrow range of quotation—which seems to be the expression of a feature which marks the Ceylon Tea of today, viz.: a more uniform character predominating throughout than used to be the case. There is now less tea of specially fine quality than was at first made, and a scarcity of the rich mellow liquoring varieties peculiar to Ceylon. On this and other points, what we have written under the head of Indian is equally applicable; and Ceylon, being a younger industry, can still less afford to risk the reputation

which real merit won for it. So long as that is maintained, there is every reason to think it will keep its position in the Home market; while, as regards its introduction elsewhere, prospects are encouraging in Russia, where price is no object, as well as in America and Australia. Export from London is now at the rate of 1$\frac{1}{4}$ million lb. per annum: and steady progress should follow the persistent efforts being made to attract buyers in other markets.

In their own interests producers should do what they can to lessen the number of separate invoices and breaks, for it is becoming difficult even for the most industrious buyer to examine all the samples offered. While estates are giving a small yield unsorted leaf might be shipped, but not where crops are large. Retailers like to select and blend for themselves: and demand from different parts of the country calls for tea of such different grade and type that it could not be fully met by unassorted leaf, devoid of distinctive character in cup. The great variety of Indian has been of primary aid in extending its use; and this will almost certainly be the case with Ceylon Tea.

The probable effect of the reduced duty on values has been much discussed. Judging from the active demand, coincident with the reduction and the advance in prices, the result has been favourable to the best teas, *i.e.*, to Indian and Ceylon, not to China. This tends to confirm the opinion held by some who are in close touch with consumers, that the public may take advantage of reduced retail prices to buy better tea; which agrees with our observation, often recorded, that tea-drinkers are learning to appreciate the benefit of using good qualities.

TRANSACTIONS IN CEYLON TEA AT AUCTION.
Twelve months ending 31st May,

	pkgs.		lb,			per lb.
1890	...450,000	equal to	31,500,000	Av. pr.	about	11d
1889	...381,500	,,	26,500,000	,,	,,	10$\frac{1}{2}$d
1888	...227,000	,,	13,600,000	,,	,,	1s 0$\frac{1}{2}$d

INDIAN, CEYLON AND JAVA TEAS.

Having quoted above that portion of Messrs. Wm. Jas. & Hy. Thompson's annual tea review which referred to Ceylon tea, we now—see page 93—give the more extended remarks on Indian teas, to which readers of the review of Ceylons were referred. Planters will, no doubt, give due consideration to the advice proffered and the information afforded. Some of the figures appended are interesting. Out of 36,107,000 lb. exported in the season ended 31st May, the vast bulk was China, the proportion of Indian seems to have been about 3 millions and of Ceylon 1$\frac{1}{4}$ million, or 4$\frac{1}{4}$ millions of Indian and Ceylon kinds against nearly 34 millions China. It is, of course, a testimony to the better qualities of the Indian and Ceylon teas that so much should be taken of them for home consumption and so little left for export. But as production increases, so will the quantity available for export *from Britain.* The italics are used to remind our readers that the exports of tea direct from India and Ceylon to markets other than that of Britain are considerably in excess of the figures we have quoted. Altogether this year we suppose about 8 millions Indian teas and fully 4 millions Ceylon will be diverted from British consumption, by being consumed in the countries of production or sent direct to Australia, America and other countries. The exports from Britain for 3 seasons have been:—

1888	...	35,200,000 lb.
1889	...	39,500,000 ,,
1890	...	36,107,000 ,,
	Total	110,807,000 ,,
	Average	36,936,000 ,,

or close or 37 millions, of which, probably, for the 3 seasons, 34 millions have been China, against an average of 3 millions Indian and Ceylon. The figures for home consumption for the 3 seasons are *not*, as Messrs. Thompson say, altogether satisfactory, even if we take into account Mr. Goschen's statement that 7 lb. of Indian or Ceylon tea leaf are equal to 10 lb. of China. The progress in the 3 seasons has been as follows:—

1888	...	183,000,000 lb.
1889	...	185,250,000 ,,
1890	...	187,940,000 ,,

The increase in the 3 seasons has been only 4,940,000 lb., or not quite 5 millions of pounds. While the *home consumption* of Indian has increased steadily and that of Ceylon rapidly (from 12$\frac{1}{2}$ millions to about 32* in the 3 seasons), and while Java shows a slight decrease, China has gone down as rapidly as Ceylon has gone up, the decrease on the tea which had once the monopoly of the world having been from say 85 millions (home consumption) to 55, a decrease of 30 millions, against an increase in its ousters of

Indian	...	16,000,000 lb.
Ceylon	...	19,000,000 ,,
Total	...	35,000,000 lb.

—the equivalent of 50 millions of China, on the principle enunciated by Mr. Goschen. With the reduction of duty, let us hope that our British friends will henceforward drink as much of the stronger infusion as they formerly did of the weaker, and *more*; the abominable custom of putting the teapot on the "hob" being abolished, so that tannin may be imbibed in moderate and useful quantity and not at a rate which is injurious.

The figures for the course of prices in the three seasons are interesting. As deduced by the eminent brokers the figures for Indian teas show a commencement with 1s; a rise to 1s 0$\frac{1}{20}$d; and finally a fall to 10$\frac{3}{7}$d per lb. Ceylon began with a higher figure 1s $\frac{1}{2}$d, but instead of rising fell next season to 10$\frac{1}{2}$d, recovering to 11d, which is 4·7ths of a penny higher than the average of Indian for last season. Ceylon is likely for several years to go on gaining on India in total produce; but no matter what aggregations may be made in the formation of companies in our island, it is difficult to suppose that any one "concern" in Ceylon will ever approach the old Assam Company with 7,520 acres of land and a production equal to 2,674,000 of tea. The Joktai follows with 4,922 acres and 2,309,000 lb., while the Assam Frontier Company, although its acreage is only 3,300, shows an outturn of 2,380,000 lb. Besides these 3 above 2 millions, there are 3 more above 1 million, and quite a considerable number with between 500,000 and close up to 1 million. The average yield per acre for the Indian estates is 408 lb., against, for our much younger Ceylon estates, an average of between 200 and 300 lb. If, as in the case of India, "mature" tea only were counted, our average is quite equal to that of India.

In 1889, out of 34,346,000 lb. of tea exported from Ceylon, we find that 1,689,000 were diverted from Britain. This quantity added to 1,250,000 exported from Britain makes up a total of 2,939,000 lb. Local consumption will certainly more than make up the round 3 millions, perhaps 3$\frac{1}{2}$ millions? Our chief export was to Australia, 1,162,783 lb., against only 87,664 in 1885. Next to Australia we have, strangely enough, British possessions in India 383,544 lb. against only 5,000 in 1885. The United States come in a very poor

* Approximate figures for exports deducted from total deliveries.

third with 24,000 lb. This is an increase on 366 in 1885, but a great fall from 42,000 in 1888. But we are only feeling this market. To Mauritius we send nearly as much as to the United States, and not far behind is France, while Germany, with 33,000 lb. to the two ports of Hamburg and Bremen, is even in advance of the United States. The Straits Settlements are down for over 7,000 lb., while over 8,000 for Suez are not all for consumption in Egypt. Over 5,000 lb. actually went to Hongkong, to compete with China tea. Russia took 3,700 and Austria 5,300, Italy contenting herself with 2,281. A quantity equal to 2,884 went to Bushire, and 1,315 to Malta, while besides the quantity already credited to Hongkong 1,105 are down for "China"! Japan also took 450 lb. Who could have predicted such a reversal of trade, even ten years agol In moderate quantities, at present, our teas find their way to every part of the world, and we may hope that thus a taste for what is pure and good in the shape of beverage may be created or extended.

Java teas have been hitherto of but little account for quantity or quality, but last sales show a wonderful spring upwards in prices. There can be little doubt that the improvement is largely due to the increase in the production of Assam kinds, which, grown in Java at low elevations, come rapidly into bearing. Java is likely to take a more important position than it now occupies.

INDIAN TEA: ANNUAL REVIEW.

MINCING LANE, June 1890.

The record of the season, completed by the figures for the year ending 31st May, is a satisfactory one, from whatever point of view it is regarded.

Production has increased, but not at the cost of quality, for the crop as a whole has been rather above the average in merit—if we except the want of flavour which characterized a portion of it—and to this we attribute the fact that *a great increase in consumption has been attained, without the incentive of lowered prices*, notwithstanding the growing competition of Ceylon.

The question of quality is, indeed, the most important matter which can engage the attention of those concerned in production; for while there is evidence that Indian tea has taken a hold upon popular taste, so firm that it will not easily be shaken, there would be risk of reaction if quality were lowered in pursuance of a policy having for its principal aim a heavy yield. That some, attracted by the prices lately paid for the lowest grades, will adopt such a policy must be expected—and there are no doubt, many estates so situated that a large crop can be secured with more certainty than a fine one—but for those who have proved their capacity to make good tea, without unduly limiting the out-turn, it would be a hazardous experiment, and one affecting not themselves only, but the general interests of the industry. Reputation counts for much—and a crop is apt to be reputed good or bad, as a whole, from the character of those leading brands with which every considerable trader in the kingdom is familiar. This especially applies to Assam and Darjeeling teas, because the difference between their fine and common qualities is marked by a wider range of quotation than in tea produced elsewhere; but the principle is of general application, and operates with more and more advantage every year, as supplies increase, to those who have succeeded in establishing a high character for their brand. To those who have hitherto been less successful than others in this respect, it should be an encouragement to know that the season has afforded instances of teas rising to a high place in the market's estimation solely on their merits.

The inferior character of the China crop has contributed to the progress of the Indian trade at home—indeed, the point has been reached at which the buyers scarcely account the low current price of China congou a matter affecting the value of Indian—but, on the other hand, the rapid growth of supplies from Ceylon, and their popularity operate in the other direction. Good medium Indians,—especially pekoss and braken pekocs–have unquestionably suffered from this competition, but not the finest qualities, which are too distinct in character to be displaced, whereas good Ceylon teas can be substituted in a bleod for Indian of average quality whenever price ersinoff-ucemodnt,

The quality of the coming China crop, and the general character of Ceylon teas, remain the factors of uncertainty; but we have, so far, no indication that the conditions which have shaped the course of the market in the past are likely to be largely modified.

Matters of detail are so fully grasped by those who have the management in India and at home, that it is only needful refer to them briefly. The necessity, and the advantage, of putting large breaks upon the market have led to a gradual abandonment of factory bulking. From many points of view this is a retrograde movement; but on the whole we do not think it prejudices value. Careful observation of results in the case of large concerns which have resumed London bulking, shows that tea is brought to market in the highest condition, provided that no considerable period intervenes between bulking and sale. This of course implies that tea deteriorates after bulking here—and it may be asked how does that affect the buyers' estimate of value. As a matter of fact the "keeping quality" of what they buy is not studied by the trade so much as it was when they carried heavy stocks: the opposite policy now prevails, and is fostered—by the unbroken inflow of supplies. This necessarily tells against sellers in the months when pressure is heaviest—or when the crop is a poor one, as in 1888-9—but it has made the general position of the article sounder, and imparts an elasticity to the market when supplies are curtailed, unknown in former years. Prolonged periods of depression such as were experienced in times past, are now infrequent, and the reason is that the distributors, holding small stocks are constantly buying.

A subsidiary question, but one of the deepest concern to producers, is that of finding fresh outlets. Towards the 190 million lb. probably required for home use during the coming year, India and Ceylon together will contribute fully 150 millions; and the time is approaching when the combined crops may equal the total Home Consumption. As it is not likely that China tea will be entirely displaced, the contingency of a supply eventually heavier than can be taken at home must be faced. Taking as a basis the figures for the five months of this year recorded by the Board of Trade, the annual export of Indian tea is only about three million lb. Russia, the largest European outlet, will probably remain closed to us so long as it can get the China congou which popular taste demands. There remain Australia, Canada, and the United States. Good progress is being made in the former market from Calcutta: and systematic work, originating in London, is being done in the States and Canada, but much more would be effected if producers as a body applied themselves to it: meanwhile, we must hope that the enterprise of those who are advertizing and pushing the sale there may bear fruit. Unfortunately the American market does not yet see the merit in our finest tea, and demand is so limited by price that business is checked by any advance here; it will therefore be necessary to come into closer contact with consumers, in order to cultivate the taste for our tea.

The following figures for the past season, kindly supplied to us by proprietors, cover nearly 73,000 acres yielding 29,800,000 lb., an average of 408 lb. per acre, realising an average sale price of 11⅛d per lb.

Previous tables showed the following results :—

	Acreage.	Quantity. lb.	Per Acre.	Price per lb.
1888-9......	66,000	27,200,000	412	0 10 -37
1887-8....	60,000	22,664,000	377	1 0 1-20
1886-7....	56,300	21,500,000	382	1 0

W. J. & H. THOMPSON Brokers.

MINERALS AND GEMS.

The total value of minerals and gems produced in the Madras Presidency during the year 1889, was R8,14,528. Gold is not returned by the Nilgiris, the total being 2,186 oz., valued at R96,944. Iron was chiefly obtained in the Bellary and Malabar Districts. The total for the whole Presidency was about 119 tons, valued at R11,614. Of quarry stones, granite and limestone are the chief sources of revenue, the former contributing 402,396 tons, valued at R2,59,656 and the latter 1,421,752 tons, valued at R1,83,605. Of other items laterite is returned at 178,592 tons, valued at R86,094; sandstone 62,000 tons, valued at R22,255; trap 228,412 tons, valued at R77,002; 315 tons of clay, valued at R495; 58 tons of slate in the Kistna District, priced at R140; and other quarry stones 63,703 tons, valued at R67,377,729 cwt. of corundum or balpum were quarried in the Anantapur district,

the price being R154. Of ochres, there were 1,026 cwt. valued at R336; six cwt of plumbago in Vizagapatam, valued at R15; and 1,954 cwts. of soapstone at R8,840. The largest amounts are contributed by the districts of Nilgiris (R1,51,870), Salem (R1,44,198) and Kistna (R1,09,482). In Kistna and Salem large quantities of granite and limestone are quarried, while gold is the chief item in the Nilgiris. Trap also forms an inconsiderable item of revenue in Salem and the Nilgiris.—*Madras Times.*

DURABILITY OF FENCE-POSTS.

To the Editor of "Garden and Forest."

Sir,—I am told, though not authoritively, that a fence-post will last much longer if put in the groued upside down. Can you let me have either a confirmation or refutation of this? B.

Mount Airy, Philadelphia.

[Some years ago Dr. W. J. Beal, of the Michigan Agricultural College, selected sticks of thirteen different kinds of timber. Each stick was cut in two in the middle, and each of these was split, making four sticks from each one. One set was placed in sandy land, and the other in clay land; in each place putting near each other a stick "top end up," and its mate "bottom end up." In some cases those with top down lasted best; in some the reverse was true, while in others there was no perceptible difference. The conclusion reached was that, so far as durability goes, it made no difference which end of the post was set in the ground.—Ed.]

THE WONDERFUL SLAG WOOL.

Slag wool is formed by causing a jet of steam to impinge upon the stream of molten slag as it issues from the furnace. This has the effect of dispersing or breaking up the slag into countless small bead-like particles, each of which, as it flies away, carries behind it a delicate thread of finely-drawn or "spun" slag. In order to collect the slag filaments thus created, and to separate the fibers from the bead or heavier portion of slag, the steam jet is arranged at the mouth of an open cylinder of sheet-iron, in which a strong air current is induced by means of additional jets of steam. The tube or shaft is furnished with a shield or striking plate which detains the heavier particles, the lighter slag-wool being carried by the draught upward and onward into a large chamber like a gigantic meat safe, having its walls formed of wire netting with about sixteen meshes to the square inch. Here the steam condenses and escapes, and the slag wool, which has the appearance of flakes of snow, is deposited on the floor and round the sides; the lightest portions being carried to the greater distances.

The filaments of slag formed this way, though of considerable length, are of such delicacy and fineness that they are broken up into numerous fragments and felted together into a substance much resembling cotton wool. This mineral wool is extremely light, and absolutely fireproof; it is a marvellous non-conductor of heat and of sound, and it is so porous that it will absorb large quantities of water and retain the same for a considerable time.

It has been found extremely valuable as a covering for boilers, water pipes, and such like—owing to its relatively low conducting powers—and for fire curtains for theaters, its lightness and resistance of fire and sound rendering it an excellent substance for such a purpose. It is, moreover, an antiseptic, and this property, along with its extreme porosity, renders it applicable for medical purposes.—*Newcastle (Eng.) Chronicle.*

Mr. Thomas Christy has again come back into our midst from his Eastern travels. He has collected a wonderful variety of new and interesting drugs during his visits of exploration to the Constantinople bazaars, and may by-and-bye favour the drug trade with some notes concerning these.—*Chemist and Druggist,* June 19th.

COFFEE PLANTING IN TAVOY, BURMA: PROSPECTING IN THE HOLIDAYS:

By a Searcher for New Pastures.

On arrival at Tavoy my first step was to possess myself of such information as papers in the Deputy Commissioner's office afforded, both with repect to lands where planting enterprise had already been attempted and available lands in the district in general. The situation of the former I found to be at the extreme southern end of the district, and the history of their election, demarcation, attempted cultivation, and abandonment is instructive. It would appear, then, that about the year 1882 Mr. Smeaton, Director of Agriculture of British Burma, happened to visit Johore, and there made the acquaintance of a gentleman from Ceylon who had been instrumental in opening out various coffee estates on lands leased from the Raja of Johore. Mr. Watson was invited to look at the lands in Tavoy, and proceeded thither. He was taken to a locality known as the Natyaydoung Range, which he pronounced as suitable for coffee; and, with the promise that he would come again, left after a brief stay of only a few days. Upon this encouragement a notification was issued by the Government inviting settlers, and orders were issued for the demarcation of a number of uniformly sized allotments, the provision of a couple of rest-houses, and the construction of a roadway leading from the town of Tavoy. There is evidence that the authorities were zealous in the matter. A base line five miles in length nearly north and south was cut, and a rectangular area marked off for plantations. The total area of this rectangular tract was thus 12 square miles, comprising twelve concession blocks of one square mile each, and in due course a topographical survey was furnished. At this time the ruin of coffee had driven many promising young men out of Ceylon, and two of these, Messrs. Dixon and Theobald, were endeavouring to obtain contracts for earthwork on the railway to Tongoo which was then being made. They came under the attention of the Chief Commissioner, and at his instance were induced to embark for Tavoy. They had little or no means, but they brought the promise with them of being assisted in all that it was possible for the Government to do.

On their way down they seemingly fell in with a Polish skipper, a Mr. Schwalky, possessed of some money, and who had had experience of tobacco growing in Sumatra. The two established themselves in adjoining blocks for a brief while only, and no vestige now remains of their work except a clump of caoutchouc trees planted by Schwalky, which have attained a good height and look remarkably fine. Incidentally it may be mentioned that the Pole came by his death in Sumatra shortly after leaving Tavoy. One of the visitors who came, and has stayed ever since, a Mr. James Watson from Ceylon, refused to take up any of the demarcated blocks, and was allowed to select a plot close to the town of Tavoy.

Mr. Watson has been 17 years in coffee in Ceylon, and has been endeavouring for now five years in Tavoy to turn his experience to profit. His difficulties have been many, arising from an absolute want of means to extend his cultivation. In his home plantation he has successfully reared many species of products, which evidence what can be grown in the district at a profit if undertaken on a large scale; and it is to Mr. Watson's credit that he always manages to keep on good terms with the natives, and is able to command ample labour, had he the means to employ it. Government have encouraged Mr. Watson by the payment of a handsome bonus for coffee grown by him, and have otherwise recognized his claims to consideration by the grant of a tract of 400 acres rent free for a period of twenty years. Mr. Watson has all this land upon his hands just at present, not having the means to work it, and Government have declined to help him with any money advance. This completes the history of planting enterprise in Tavoy up to date.

A great deal of money has been spent by Government, and some by private individuals upon the advice of the gentleman from Johore. Naturally, I went in this direction, first of all, to see for myself. I had the good fortune to be accompanied by the Deputy Commissioner, who was attended by an Extra Assistant Commissioner, a Burmese gentleman of many years' residence in the district, and who had accompanied Mr. Watson to Natyaydoung. We traversed the tract which had been aligned in 1882, which may be described. There is a good driving road from Tavoy to Thatyatchoung, 18 miles, which is the anchorage of the mail steamers. This was our first stage, halting for the night in a Public Works Department resthouse. The second day's journey was a bridle path through forest 11 miles to Pywehoogyee, 28 miles on to Sousin, on the Mindat river. We passed the night in the house of a villager. The next day commenced with the business of getting ferried over the Mindat river, which in this part is a broad stream. On the opposite bank the path runs over raised earth through paddy fields, and winds its way through the village of Yayngai across one or two nullahs, one in particular large and deep, the haunt of alligators, to Khedive. From hence the most direct way would be onwards along the course of the old military road known as the Alompra Road, but the path here strikes to the coast.

At Boktaung, literally on the sands, we breakfasted at midday. The track from here turns inland over slightly rising ground, and is entirely obliterated by numerous water channels impassable in the rains, and in which event at this, the most favourable season of the year, the water was sometimes up to the saddle. The last few miles of this stage run over open ground, offering poor pasturage from the inferior seed-bearing grass, and extending by a gradual slope to the base of the Natyaydoung range. The prospect is very picturesque. There is a perennial stream of good water dividing the lands which lie quite at the base of the range from the hither side, Kayinchoung, where we encamped for the night. This made three days' journey from Tavoy. On the following morning we visited the site of Mr. Schwaiky's and the other plantations, and made the ascent of the hill side. The soil at the base I found to consist of clay and sand, each occasionally predominating, and at small depth the soil becomes gritty or gravelly. This arises from numerous concretions similar to kunkur some of a brick red, some of a black colour, forming strata running in wavy lines through the soil. It was on land of this character that Mr. Schwalky attempted to raise tobacco, and Messrs. Dixon and Theobald coffee. The ascent of the hill and the existence of a large tank of water at the highest point, evidenced that the character of the rock was igneous. The forest growth was so dense that with a number of coolies cutting the way ahead we were unable to ascend beyond 1,600 feet (registered by the aneroid) without being belated or having to spend the night on the mountain side. But we obtained a sufficient view of the prospect to make it incomprehensible to my judgment how it should have been fixed upon as suitable for planters There is no hill side, but a series of stony ridges as it were buttressing the hill with steep declinations in narrow gorges between the ridges. The blocks have a general westerly aspect, exposing them to the force of the S. W. monsoon and a saline breeze all the year round. Again, if the soil were of the finest, the absence of properly maintained communication places the locality quite out of touch with the town of Tavoy, 60 miles distant, where the settler must occasionally proceed for the transaction of business and for supplies. Supposing a party of coolies were sent down from Matyaydoung—the journey would take three days, and if they had to return with loads, not less than four or five days to get back. For four or five months in the year under existing circumstances it would be impossible for coolies to get down without many risks from the flooded state of the streams. Ten out of 20 coolies would never return, some would assuredly bolt, and others would be stricken down with fever. The coolie difficulty in a wild region where the coolies were alien to the soil, and where they could not get their currystuffs and accustomed food, and where the climate is tropical, would occasion, in respect of labour imported from Behar, a certain failure. The latitude is exactly that of Jamaica, capable of producing coffee and various remunerative products, such as indigo, which I found to be growing wild on the land skirting the base of Matyaydoung. There is no doubt that it is indigenous, and could be cultivated with profit. But the prospecting of land requires special knowledge of the character of the soil and of the most suitable crop to be planted thereon; and in this connection the experienced planter will not so much regard the surface of the land in growing coffee and other fruit trees as that the subsoil must be friable and drainable. Clay land and rocky land is always water-logged, and especially detrimental to the cultivation of coffee and cinchona.

I have stated that the Burmese Extra Assistant Commissioner who piloted Mr. Watson accompanied the Deputy Commissioner on the occasion of my visit to Natyaydoung; and from this gentleman, who has resided in the district for more than 30 years, I was able to gather a mass of valuable information with regard to culturable lands elsewhere in the district. From what he told me I am inclined to the supposition that some confusion in two very similar names led to Mr. Watson visiting Natyaydoung in place of Nawadoung. At any rate, Moung Pet, the Burmese gentleman alluded to, was very pressing that I should visit Nawadoung, which lies in a valley at the head of the Mindat stream on the eastern side of the Oxhump or Nawalabo range. There are said to be miles of rich undulating land, the produce of which might be carried away by the water carriage afforded by the Mindat river. The journey to this spot, however, involved three days by boat and canoe, and I was anxious to prospect the more central part of the district and the land at the head waters of the Tavoy river in a northerly direction. But still, in view of the Nawadoung valley affording culturable lands accessible by the Mindat river, we proceeded to the mouth of that river, where it empties itself to the Tavoy river, as a likely site for the disembarkation of coolies and stores, and for the establishment of a depot. The channel here is stated to be six fathoms, and navigable for some 14 miles. We encamped on the river bank for the night, and returned to Tavoy by water in time for Christmas. It is noteworthy that there is an almost entire absence of roads, and the interior portions of this district, which covers an area of 7,150 square miles, have apparently rarely if ever been visited by Europeans. No Deput Commissioner in recent times has been here sufficiently long to go much into the district, which is impenetrable during the rains, and malarious on their cessation. In these circumstances it cannot be too distinctly made known to the intending visitor desirous of prospecting for land, that he should provide himself with a complete camp equipment of furniture and cooking utensils, a cook, pony, and stores, and a well filled bag of rupees for the hire of elephants and coolies.

I have pointed out that the demarcation of a prescribed area for the location of intending settlers was a blunder from the unsuitableness of the site fixed upon, and a double barrelled blunder in the sense that, while the varying soil of the district invites every description of cultivation congenial to the latitude and altitude, coffee cultivation would seem to have been alone contemplated. The moral of it is that, in a district the area of which is 7,150 square miles, the responsibility of selecting land should rest with the settler. The district officer is not in a position to help him, at any rate much. Frequent changes of the Deputy Commissioner have not allowed of the officer in charge gaining that knowledge of the district only to be acquired by personal visitation. It is an absolute fact that the greater part of the Tavoy district is *terra incognita*, and portions of it would seem never to have been visited by any European within the memory of local tradition. The absence of roads, the dense forest growths, and the consequent unhealthiness of the interior certainly do not invite the district officer to penetrate the country, and the obligation of his executive duties

as Chief Magistrate, unassisted by any competen- European subordinate, chains him at headquarters. The district officer, furthermore, however ubiquitons cannot be accepted as an authority on the suitableness of lands for planting purposes; and the Government can do no more than mark down the locality of waste lands and leave it to the intending settler to prospect for himself as to their suitability for his purposes. At the same time the difficulties in the way of an individual planter prospecting the district are almost insuperable, unless he is prepared to rough it very considerably and to pay heavily for every step he takes.

Only the magic influence of authority is able to command elephants and coolies and boats without vexatious delay and overcharge. All these difficulties, were smoothed to me, and there was, so to speak, only the bill to pay; but what money may not purchase was the wealth of information elicited on the questioning of villagers and headmen summoned to the Deputy Commissioner's presence in the evenings of our halts. Here I learnt many interesting particulars in regard to the nature and position of lands which my time did not allow me to visit. I have alluded to the waste of money naturally incurred by the mistaken demarcation of allotments for planters on the Natyaydoung range, and the construction of a road thereto from the town of Tavoy, 60 miles distant, all arising from an insufficient knowledge of the district and of the lands most suitable for varieties of cultivation, points which planters alone are capable of determining; and I would throw out the suggestion, although Government has little enough money to spare for such a purpose, yet that for just once in a way the Government might make up a party of three or four practical planters and send them all round the district on a cold weather tour with the Deputy Commissioner. The outcome of this might confidently be regarded as something practical. To my own observation I have seen thousands of acres of splendid lands lying in valleys and on the slopes of hills, forest grown, and inaccessible for want of road communication with a main track such as a systematic survey by planters would indicate to be both natural and convenient. The longest open route in the district is along the alignment of the telegraph line running from the town of Tavoy, 40 miles, to Muttra in the centre of the district and along the valley of the Tenasserim river for 40 miles more, until it strikes through a pass in the hills leading into Siam. This is commonly known as the old trade route, but as a matter of fact it has never been a trade route, old or new, and there never has been or is there any trade passing by this or any other way into or from Siam. As I am informed, there was of yore a track through the forest directly over the hills in the wondrous straight line of travel marked out by natives for themselves in primeval tracts where the D. P. W. is yet uncreated, which struck the Tavoy river some few miles above where it empties itself into the sea. This route presented many dangers by flood and field, from wild beasts, and hardly less dangerous now if the traveller escaped drowning from broad rivers and swollen streams. It was the known highway, but was rarely travelled on, and came to be altogether abandoned upon the construction of the road along the telegraph alignment. This road, which has cost a great deal in construction, and which involves a heavy maintenance charge to keep it in repair, serves no trade purposes. There are not, perhaps, 100 travellers passing along it in the year. It is purely for the quick repair of the international telegraph line communicating with Bankok. The utility of this road for any trade purpose is problematical, seeing that Tavoy, which is capable of being made a port as good as Moulmein, at present offers no outlet or ingress for goods or produce, there being a wretched steam service supported by the mail subsidy. It is capable of tapping the district in various parts along the course of produce which might be grown; but for more than half its length, after crossing the water at Mitha at the confluence of the three rivers which unite here, it pursues its way along the bank of the Tenasserim river, overhung by a steep hilside.

The Tenasserim river runs due south from Mitha, where it takes a bend and runs parallel to it under the name of the Bainchown, which has its source in the hills at the Natyaygoung end of the district. It is up the valley of the Bainchown that the principal road would have to be made. Here on both banks there are fertile lands sloping to the water and breasting the hills. It is here that the familiar expression of thousands of acres of rich lands lying uncultivated may be rightly applied. The valley is broad, open, and wide, and yet is shut in until at its southern extremity the mountain track already mentioned as the ancient highway to Siam shall have been adapted to wheeled traffic. But it is not here alone that thousands of acres offer, but all along the valley of the Kamounthway which is the name of the third river uniting at Mitha. The Kamounthway runs due north, finding its source on the hills which are as a wall between Tavoy and the adjoining district of Amherst, and from which the River Tavoy also derives its origin. At the head waters of the Tavoy river the Government has its principal Forest-reserve which is rather of the nature of a prospective reserve, not yet supplying timber in any quantity. Indeed, the two forest reserves, one in the north and the other in the south, appear to me to have been marked out in localities from which the timber can only be got out at greater cost to Government than it can be worth while to incur, viewing the proceeding in the light of an ordinary profit and loss transaction. Obstructions in the river necessitate blasting on a large scale at several points; and the art of timber felling by the employment of machinery has yet to supersede the rude methods practised by the Forest Department.

All down the Tavoy river there are lands suitable for the planter, that is to say, at various points, and standing back from the river almost until the town of Tavoy is reached, where the country is lowlying and alluvial, and for the greater part only capable of paddy cultivation. I have been asked what Tavoy is capable of growing besides paddy that would be profitable to the settler. The enumeration of crops and economic products is emphatically endless. All that the fertility of Ceylon and the Straits Settlements may produce is concentrated in Tavoy, with the advantage of latitude, and with the peculiarity that here will be found in more luxuriant growth, the flora of considerable altitudes on the Coromandel or opposite coast, and elsewhere in India. The *Quercus fenestra*, a species of oak common to the mountains in the vicinity of Sylhet, grows indigenous in Tavoy, not fifty feet above the level of the sea. The gamboge *garcinia pictoria*, which grows on the highest parts of the Wynaad, is found at the foot of the hills in Tavoy, which border on tide water. The *Ardesia humilis* is a common shrub at Tavoy, growing down to the plains, but its habitat on the other coast is the eastern slopes of the Neilgherries in sub Alpine jungle. Indigo is seen growing in wild profusion all the year round. The flora reads a lesson as to the climate of the country which cannot be mistaken, notwithstanding the unfortunate conditions of heavy rainfall. There is not the least doubt that, with temperance, and avoiding unnecessary exposure, Europeans may live in Tavoy longer than in Assam, if, be it noted, an extensive clearing of forest, and drainage so as to divert flood waters, were systematically undertaken. This rich and great tract of country has never been opened out by private enterprise in the whole course of the 60 years that it has continued under British rule, and its head quarters or principal town comprises an inconsiderable village. The town of Tavoy stands in alluvial ground, and is hidden in the distance by tall palms and glossy-green jacks, and yellow-flowered cassias and twenty other flowering trees which overshadow its humble dwellings. From a neighbouring eminence the prospect is of undescribable beauty, a plain of encircling paddy fields intersected on the south by a silver stream fringed with the dark foliage of wild fig trees and the thick struggling bushes of a species of trihiscus covered with large yellow and red flowers. On the east "hills peep over hills" like the seats of a vast amphitheatre, bounded by Ox's Hump, rising in

a most picturesque ontline four thousand feet above the plains. In the distance is seen a foaming cascade making a fearful leap from a gorge halfway up the highest mountains. Green forests aro diversified with rugged rocks, while here and there a whitened pagoda lifts its conical head above the summit of an isolated hill, or the smoke of a solitary hamlet is seen curling upwards on the still air. It is beautiful, when seen on the coast, with the picturesque beauty of Scottish hills; but it is still more beautiful when seen around its mountain streams. The traveller's path often made up the middle of one of these streams, and every turn reveals something new and pleasing to the eye:

" Ferns, flowers, and grasses creep,
Fantastically tangled; The green paths
Are clothed with early blossoms; through the grass
The quick eyed lizard rustles, and the bills
Of summer birds sing welcome as ye pass;
Flowers fresh in hue, and many in their class,
Implore the pausing steps; and with their dyes,
Dance in the soft breeze in a fairy mass;
At every door the odorous jasmines rise,
Kissed by the breath of heaven, seem fragrant for the skies.

—*Englishman's Overland Mail.*

EAST AND WEST INDIAN SUGAR MAKING.

There is much scope for the establishment of large Sugar plantations in this country in places where the soil is good, labour cheap, and an ample and certain supply of water available. Land in Northern India, in the vicinity of the canals, would, I should say, be admirably adapted for this purpose. There the soil is good, with a perennial supply of water for irrigation, and a redundant population.

The soil and climate of certain portions of the Central Provinces where there is, or could be, considerable irrigation from tanks, as in the Sambalpur and Bhandara districts, and in some of the Feudatory States of Chattisgarh, would also be suitable. The former would probably be more suitable than the latter, for while the Canes might occasionally suffer from frost in Northern India, in the Central Provinces the supply of tank water might fail in years of insufficient rainfall.

For the formation of a plantation after the model of those in the Mauritius and in the West Indies, the action of Government will, at any rate, in the first instance be necessary.

The small cultivators of India have neither the means nor the inclination for undertaking such a task. It would never occur to a large landholder in this country to make money by growing Sugar on a large scale by new and improved methods, and by the expenditure of a considerable capital. By the trading classes the whole thing would be regarded as entirely beyond their sphere of action. The only persons who would perhaps have the requisite enterprise and means to undertake such an industry on a large scale are European planters, who can command the necessary land and capital, but they have already profitable crops, like indigo, which do not involve the same expenditure, and which can be carried on without extensive irrigation. It would be impossible for a West Indian planter, supposing he could command the necessary capital, and was prepared to make the venture, to provide himself with the requisite land. There are, it is true, extensive waste lands in this country, but they are quite unsuited for such an undertaking. They are either far removed from inhabited tracts, or are situated in unhealthy countries, where no European could live, and even if accessible, they are rocky and barren. The natives of this country are only too ready to appropriate all land, which is at the same time fit for cultivation and fairly accessible, and they have already absorbed all such land as is available or worth appropriating. No native will willingly part with the land he cultivates, and if the whole area of an ordinary village could be purchased, a large portion of it would be in the cultivation of ryots, with occupancy and other beneficial interests in their fields, who could not, in the ordinary course of law, be rejected to make room for Sugar cultivators. Under these circumstances, a Sugar-planter, who, whether he came from Barbados or the Mauritius, would be a stranger in this country, would find it difficult, if not impossible, to make satisfactory arrangements for the establishment of a plantation.

It will be necessary, therefore, for Goverument to take the initiative in this matter, and by means of the Land Acquisition Act, or other appropriate procedure, to acquire land sufficient for the establishment of a Sugar plantation of 500 or 600 acres. This might be offered rent-free or on easy terms to a practical planter under certain conditions for a term of years, and he might also be given a subvention to aid him in providing the necessary machinery for the manufacture of Sugar.

There must be many enterprising planters in the Mauritius accustomed to Indian coolies who would be glad to accept an offer of this kind. By making success dependent on the efforts of the person chiefly interested in the project, there would be a guarantee that everything would be done to make the scheme a success. But in the event of no practical Sugar-planter being willing to undertake the responsibility of a Sugar plantation on the above terms, it would be well for Government to establish a few model plantations of its own in different parts of India. I understand that some years ago the services of a Sugar-planter were obtained from the West Indies for the diara lands of the Khedive, and that a vast improvement followed the introduction in that country of the West Indian method of growing and manufacturing Sugar. With a plentiful supply of water, such as would be afforded by our canals and large tanks, a good soil and cheap labour, no great difficulties would be encountered in the establishment of a Sugar plantation. If the scheme were once shown to be successful, it is probable that many persons who can command large areas for Sugar Cane cultivation and the necessary capital would adopt it. The greatest difficulty to be encountered would be the securing of an adequate supply of manure. Much of the cowdung of this country is used for fuel, and consequently, good farmyard manure in large quantities is not readily obtainable. But if Sugar cultivation by the West Indian method were shown to be profitable, mineral and artificial manures would be available in India as they are in Barbados and in the Mauritius.

The value of such a plantation would not be confined to improving the production of Sugar. It has often occurred to me that in establishing model farms and placing at their head men trained in England and having a practical knowledge of the agricultural methods only of countries with a temperate climate, that we have somewhat overlooked the fact that the conditions of agriculture in the greater portion of India resemble those of the West Indies or the Southern States of America much more closely than they do those of Europe, and that it is in these former countries that those Indian crops which are most susceptible of improvement, such as rice, cotton, tobacco, Indian-corn, Sugar, tropical roots, vegetables, and fodder crops, are cultivated with the greatest success.

The West Indies, like Mauritius, import the greater portion of their food, but a good deal of Indian-corn and vegetables are also grown in these Islands. A plantation is generally divided into two portions: one is under Cane and the other is under preparation for Cane, and is in the interval used for growing short crops, sweet potatoes, yams, Indian and guinea-corn (juari)—the two latter, with guinea-grass, supplying the necessary fodder for the farm cattle. All of the above crops are capable of great improvement and extension in India. While in this country a few yams are to be found in pan baris, the plant is reared in the West Indies in large open fields. The difference between the sweet potato of India and that of the West Indies is striking. The former is generally an elongated tuber, five inches long and three inches in diameter, and is grown on a flat surface. In the West Indies it is ordinarily an ellipsoid, with axes of ten and seven inches, and grown in rows on banks and

not on level ground. There are other striking differences in the systems pursued in rearing other crops in the West and in the East Indies. The establishment of a plantation on the West Indian model in this country could not, I think, fail to improve the cultivation of all tropical products, and to instruct the people in methods of which they have no idea at present. Some of the return coolies from the West Indies and the Mauritius might also be induced to take service in such plantations, and by instructing their countrymen would be of use to the manager in starting the work.

I might usefully recapitulate the above remarks as follows:—The improvement of Sugar production in India is not possible under existing conditions of scattered cultivation by numerous small cultivators, and in view of the fact that it is nowhere a staple but merely a subsidiary crop. I have further endeavonred to show—

(1) That cultivation on a large scale is essential, if the requisite supervision in growing the Cane and the necessary machinery for manufacturing Sugar are to be provided.

(2) That such a change cannot be brought about unless an adequate area of irrigable land in a healthy and well-populated country with cheap labour is first secured.

(3) That private effort and enterprise are probably unequal to the task of securing the conditions necessary for successfully starting the work.

(4) That it will therefore be expedient, in the first instance at all events, for Government to take the initiative, and to establish a model Sugar plantation.

(5) That the best method of working such a plantation would be to interest the manager in the success of the scheme by leaving the profits to him, Government assisting by finding the land and giving it rent-free or at a low rent, on certain conditions; and, if necessary by a subvention, to aid in the constructing of the necessary buildings, and in supplying the machinery needed.

(6) That in the event of no properly qualified person being willing to undertake the establishment of a Sugar plantation on the above terms, Government should itself arrange for the working of the scheme by a paid agency.

(7) That it would be absolutely essential for the success of any scheme of this kind, that the manager should be a successful and practical Sugar-planter, preferably from the West Indies or the Mauritius, and accustomed to deal with the Indian coolie.

(8) That the establishment of such a model plantation would not only prove the superiority of the West Indian over the Indian system of Sugar production, but would bring to the notice of Indian agriculturists the advantages of other modes of cultivatin, many tropical crops, which, though of great value, have hitherto been much neglected in this country. —*Produce Markets' Review.*

TOBACCO:—LONDON BORNEO CO. (LTD).

The first yearly general meeting of the shareholders of the above company was held at Cannon-street Hotel, on the 23rd Dec. 1889. The Hon. Charles Hedley Strutt, chairman of the company, presided. There were also present Mr. Thos. Palmer Chapman, Mr. Wm. M. Crocker, Mr. Henry Devitt, and Mr. Wm. Henry Read.

The Secretary having read the notice convening the meeting, the Chairman said:—Gentlemen, I hope that none of the shareholders have been disappointed or discouraged by the nature of the report which the directors felt it their duty to place before them at this meeting. We did hope that we should not have experienced the difficulties and troubles which always beset every tobacco planter. We hoped so because we adjoin the prosperous estate of Ranow, and the experience gained there by our managing director would, we thought, have entitled us to avoid the usual difficulties, troubles, and delays, and have placed us in a very favourable position. Things did not, however, quite turn out as we expected, and the reasons for it are given in our report. The chief one is the amount of sickness which seems inevitable in opening out these fresh plantations. We have been specially unfortunate in the loss of our head manager by death, and the sickness of one or two of the sub-managers; and I believe at one time that Count Charles de Geloes d'Elsloo, our managing director, was the only European left, and upon that occasion he manifested the greatest energy, taking the whole management on his own shoulders, and even went so far as to sleep out in the jungle to prevent the desertion of the coolies. (Cheers.) Although our first year's operations have not been so successful as we could have wished, we are extremely desirous that the shareholders should bear this in mind—that we are only in the same position as every tobacco company that has ever been started on the same lines as ours. Even those flourishing companies in Sumatra which now are paying their 50 and 100 per cent., every one of them had the same opening difficulties which we have passed through, and I do not believe that any one of these successful companies ever paid a dividend on the first year's working; the truth is this, that those who invest their money in tobacco plantations, although they most likely will receive most satisfactory results in the long run, must always be prepared to exercise great patience at the start, and if they do so, and courageously hold their shares, I tell them that in the end they will be glad that they were not frightened at the first temporary troubles. Perhaps some of you may think, from my remarks, that our particular part of the country is more insalubrious than elsewhere. That is not the case. I believe Mr. Crocker will tell you that our plantations are in the healthiest part of Borneo—(cheers)—and that this is simply the initial sickness that always comes when opening out fresh land in that part of the world. Now, I have in my hand a report which is made by a medical officer out in Borneo—made for the Government—as to the health on the plantations, giving details about the health of the coolies on the different estates. The report to the Government deals with the health of the coolies on eighteen estates scattered over the whole east coast. The writer says:—"It will be seen that the Maruda Bay estates head the list for healthiness, Ranow coming out absolutely best, the London North Borneo Company being No. 7 on the list." Again he says:—"The Maruda Bay at an average come out first. In looking for the reasons for this state of things the following facts are apparent. In Maruda Bay the ground is recent paddy fields for one thing, and, secondly, there is a large supply of meat food at low prices." Again, in the memorandum jutst issued by the North Borneo Company, I read the following:—"All the reports which have reached us hitherto are most encouraging. It is true several estates have suffered severely from sickness amongst the coolies, which seems inseparable from opening new estates in tropical countries; but it is encouraging to find by the returns that plantations which have been established the longest have suffered the least, Later reports speak of a general improvement in the health of the coolies on almost every estate, and the crop prospects are good everywhere."

I should also like to read you the latest news as to the Ranow estate; it gives a very favourable account as to the crop on the estate. It is as follows:—"The Ranow estate, when I saw it a few days ago was a wonderful sight. Tobacco stretching away for nearly a mile—all as level as a regiment of soldiers. There is hardly any sickness on the estate. It is expected the crop will average ten piculs per field." Now our crop, I am afraid, owing to the dfficulties, will not yield so well. At present we cannot tell for certain what it will yield. We had hoped to have had the accounts to-day from our managing director and to have told you exactly what the yield was. As I said, the difficulties we have had will affect the crop this year, owing almost entirely to the desertion and the sickness of the coolies, which prevented the land being got into proper order until too late. The early crops are always better, and this year our crop was not planted until very late. I mention the Ranow estate, as it is only simply divided from our

estate by a small stream. It is exactly the same kind of land in all particulars as our own, which should give exactly the same yield. I also mention the Ranow estate; they have gone through exactly the same difficulties and troubles as we have; they had a great deal of sickness there the first year, and the first crop was not very successful, I believe. They are now growing their fourth crop, which is so far good. The first crop was only a small experimental one; the second, grown after the formation of the company, returned no dividend to the shareholders. Last year the crop was good enough, I believe, to return a small dividend, and this year they have the crop, a description of which I have just read to you. (Cheers.) So good is the crop that they talk in Borneo of a return of 50 per cent. or even more to the shareholders. Now, I wish to point out that there is no reason why we should not have exactly the same results—(hear, hear)—in the same space of time as the Ranow estate. You will see in the report that we, the directors, have thought it wise to limit the cultivation of the fields to 800 fields. We have done so because the opening of fresh estates seems inseparable with the sickness of the coolies, and the loss of money. We shall keep opening out fresh estates, therefore, on as small a scale as possible. The coolies that we had last year were not very satisfactory; we have had to put up with some of the worst coolies. I hope we shall be able to adopt some better way in the future. We are completely in the hands of the coolie contractors in Hong Kong and Shanghai, who practically charge us what they like, and send out the coolies at so much per head. I am glad to be able to state that an organisation is being started in Borneo amongst the planters to try and get the coolies themselves firsthand, and not deal with the middlemen at all, if that can be adopted. We shall watch with great interest the trial of this plan, and if successful it will place us in a more favourable position in the future with regard to the coolies than we have been.

We expected from the natives considerable help; that is one reason, perhaps, why we have not done so well as we hoped to do, for the natives have not given us the help that we expected. The Borneo Government would, no doubt, had they not been harassed and troubled with a small war, have been able to help us by getting natives to work for us, and the natives would probably not have suffered, in opening up the ground, from jungle sickness and other sickness in the same way as imported labour. In one direction the natives have been a distinct hindrance to us. I believe that some of them told the Chinese coolies that if they would pay so much per head, they would promise to lead them back to Singapore. Having got so much per head, they led them into the thickest part of the jungle, and then left them, and went back to our managing director, telling him that they knew where the runaway coolies were, and claiming so much per head as the rewards offered for their recovery. (Laughter.) I think that those natives who get on the "windy side" of both a Dutchman and the Heathen Chinee have a future before them. (Renewed laughter.) The coolies that we have got now are of a great deal higher stamp than they were last year, but I am sorry to say that we have had to pay more for them. Labour in Borneo is generally very plentiful, but, of course, when the demand increases very suddenly, the supply is not always quite up to the mark. I have no doubt in the future that the supply of coolies will be quite equal to the demand, and that all the labour required will be forthcoming at a very moderate cost. Perhaps some of you may ask about the prices given now for tobacco, because so many new companies have started since our meeting of last year practically on the same lines as our own. Some of you may want to know, therefore, if the price is likely to fall. Well, there is no reason whatever to believe that, unless there are very much larger supplies than at present, the price is at all likely to fall. The demand increases year by year for this class of tobacco. Then the number of smokers in the world increases year by year. I see Mr. Chambers in the room, perhaps he will tell us something by-and-by about the prices for tobacco. (Hear, hear.)

The price during the past year has been satisfactory. You must always remember that Borneo tobacco is rapidly increasing in favour with tobacco manufacturers. (Cheers.) I should now like to refer to one or two points in the accounts. First of all, these accounts are for sixteen months. On reference to the profit and loss accounts, you will see £694 2s premium on reissue of the 210 ordinary shares not taken up by the original allottees. Now, there were some gentlemen in Java who wished to have shares, and they were applied for. Before we allotted one of the gentlemen died, and the other was unable to take them up, and the result was, under the advice of our solicitor, we considered that the shares belonged to the company, and we sold them, as you see, at a premium. (Cheers.) You will see in the balance-sheet, "Remittance to Borneo for the development and cultivation of the estate, £36,138 17s 8d." Of course, that is up to date (December 12); but up to October 1 last £21,000 had been spent on the estate, and of that £21,000 a very large proportion was for what may be called capital expenditure. Now, before I sit down I would like to say a few words about the land. The British North Borneo Company have already raised the price for their land to $6 per acre. That makes our land worth about £25,000; but our land is not like ordinary tobacco land. It is picked land—the best in Borneo. In fact, I may tell you that I cannot get 26,000 acres anywhere else in Borneo like it for tobacco planting. I may tell you that at the present moment we could sell a large portion of that land at $12 per acre. (Cheers.) This land, which we think is worth £40,000 to £50,000 at the present moment, has not cost a farthing of our money. We do not pay for this land until we ourselves has received 10 per cent. for our money. Now I think that there is no other company in such a favourable position as that. (Hear, hear.) We have the whole of our capital for the encouragement and growth of tobacco itself. There is no portion has to be put by for preliminary expenses, as the expense of floating the company was extremely small. I hopes with such a favourable position as that, our shareholders will not be disheartened by some little difficulties at first starting, but that they will hold tight to their shares. (Hear, hear.) If there are any question, I shall be happy to answer them, and I now beg to move: "That the directors' report and accounts from the formation of the company to December 12, 1889 be received and adopted." (Applause.)

Mr. Thomas Palmer Chapman seconded.

Mr. Joseph Cross said that he understood that the directors were not yet in a position to state to the shareholders with regard to the remittances of £36,000 to North Borneo for the development and cultivation of the estate. What proportion of that sum was on capital account and what proportion was on revenue account.

The Chairman said that up to Oct. 1 £21,000 had been spent, but more money had been spent since.

Mr. Joseph Cross said that he wished to divide the capital from the revenue expenditure.

The Chairman said that they were not in a position to show this at the present moment. They had had some accounts over, but they had not time to analyse them.—*L. & C. Express.*

AUSTRALIAN PRODUE FOR CEYLON AND TEA BACK FOR AUSTRALIA.

Ann ex-Ceylon resident writes to us by this mail:—"New South Wales, June 5th.—By the next Orient steamer my son is sending to Messrs. J. Auwardt & Co. a trial shipment of Australian produce, including butter, bacon, cheese, apples and calf skin leather, all, excepting the apples, being the produce of the famous 'Illawarra' district. Australian butter, to keep well, must be made in the winter: this is unfortunate for exporters, for the price of butter in the winter is often nearly three times as much as it is in the summer. It

will be difficult to send butter if it sells for less than R1·50 per lb. in Colombo, for not only is the price here high but the bottles in which it is packed are expensive, and the rate of exchange is also against the exporters. You will find the butter to be superior to, and the bacon and cheese equal to, the best now in use in Colombo. The farmers in the district have taken a great interest in this venture, and if it pays it will certainly be repeated. As the nett proceeds of these goods will be invested in Ceylon tea for the Indian market, planters and tea merchants should do their best to encourage the sale of Australian produce sent from Milton."

LIBERIAN COFFEE IN JAVA.

A gentleman who has just returned from Java has presented us with two magnificent Liberian coffee leaves plucked from trees two years old. They are 16 by 7 inches, and are larger than any ever seen in Ceylon we believe of their age. Our visitor reports quite a revival of interest in coffee planting in certain districts in Java. Both the Arabian and Liberian kinds are being freely cultivated and there is some talk of a Hybrid, of which he saw four plants said to bear a much more marketable bean than the Liberian tree. Dr. Treub of the Botanic Garden without disputing the fact of hybridization, refused to pass an opinion until the experiments were further advanced. Meantime, the coffee planters especially in East Java find that planting in shade, their bushes of Arabica do not suffer appreciably from the once dreaded fungus, while returns of 12 to 15 cwt. an acre are spoken of from the rich volcanic soil. While Government has retired very much from coffee culture, private planters are likely to make up the deficiency. The Liberian coffee is also very free of the fungus although some planters have considerable areas under cultivation, the trees growing to 20, 25 and even 30 feet high, a pruning knife never touching them. They go on bearing all the year round and the Java planters profess themselves well pleased with their harvests which average 10 to 12 cwt. clean coffee per annum. One great advantage of the Liberian kind to the Java cultivator is that it grows readily on old coffee land—land abandoned during the height of the fungus panic. The only enemy at present dreaded by the cinchona and tea planters in Java is the *Helopeltis antonii* which does not trouble their cacao, but revels in their tea especially. Our present visitor heard of tea crops being greatly affected by the ravages of this insect. In cinchona, he also saw and heard of great mortality through a fungus attacking the roots, to check which the planters were using a dilute solution of corrosive sublimate.

How the coffee exports have run, may be seen from the following extract from a recent authentic report on the Export Trade of Java:—

COFFEE.—The export of coffee, which amounted in 1889 to 24,281,000 kilos., contrasts not unfavourably with the last four years, when this export amounted to:—1885· 14,646,000 kilos.; 1886, 16,668,000 kilos·; 1887, 13,377,000 kilos.; 1888, 22,612,000 kilos.; but in the preceding year, the export figures amounted to—1881, 23,093,000 kilos.; 1882, 24.135,000 kilos.; 1883, 32,369,000 kilos; 1884, 24,400,000 kilos. Under the above figures are included an amount of 100,000 piculs, or 6,176,000 kilos. Government coffee, sold every year at Java, which amount, therefore, must be deducted from the figure of the export to obtain the export figure of the coffeo grown on private account. Regarding the production, the following statements are given in the yearly colonial roports. (A shows the estates on grounds leased by Government to private persons; B, the private estates west of the Tjimanok, and C, the estates on leased gronnds in both the Vorstenlanden, Soerakarta, and Djokjakarta):—

	A	B	C	Total piculs.
1879	93,000	27,000	90,000	210,000
1880	72,000	9,000	85,000	166,000
1881	154,000	11,000	101,000	266,000
1882	172,000	30,000	71,000	273,000
1883	203,000	14,000	121,000	338,000
1884	199,000	24,000	36,000	259,000
1885	167,000	15,000	37,000	219,000
1886	225,000	27,000	21,000	273,000
1887	126,000	9,000	23,000	158,000
1888	298,000	13,000	30,000	341,000

STRAITS SETTLEMENTS: PAHANG NEWS.

(*By an ex-Ceylon Resident.*)

Pekan, June 21st.

The meeting of Pahang State Council was held some time back at the *Sthana Rvpa* (in Malay, the Palace of the Sultan). The meeting was opened at 5 p.m. It consisted of His Highness the Sultan, Ahmad Muatham Shah Ebni êl Marhom Ally, who took the chair, Tunku Mohamed, the Regent of Pahang (son of Sultan), Raja Muda, the Sultan's younger brother, Orang Kaia Cheno-Unku Andah, Tuan Hitam-Tuan Hakim, the native magistrate, Orang Kaia Bakti, the late Treasurer of the State, Unkn Bandahara and a few of the native Rajas and leading headmen, and Mr. J. P. Rodger, the British Resident. Amongst the subjects that were brought before the meeting for consideration, the qnestion of slave trade was one of importance. After a long debate it resulted in the modification of the very stringent rules which are in force now. Having been approved and passed by the Council many snggestions made by the Resident for the improvement of the country, the proceedings were brought to a close at midnight.

Though the country was only bronght under British protection in July last year, it is rapidly progressing, due to the immigration of foreigners, specially Chinese from China, Canton, Hongkong, Singapore &c.

THE "PAHANG CORPORATION," a Tin Mining Co. at Knantan, have already commenced operations in opening np a railway line from Knantan to Temerloh, and then to Lipis (a distance of some scores of miles inland), and then connect this line to that of Kwala Lompor, thus having one line of railway right straight np, from the western to the eastern shores of the Peninsnla. This, in all probability. will answer for the better development of the gold, &c., mines at Lipis, and save large amounts of money which other mining Co.'s expend, for transport of materials, produce, &c., from, and to the mines owing to the present inaccessibility to certain parts of the country, as the River (the only way open for communication) when going higher and higher in the monntain districts, is not open to navigation—thus necessitating all passengers who go to the remote mines make the best of it through forests at great risk to health and sometimes to life itself.

MANY CONCESSIONS OF LAND (within the State) some extending over 100 square miles, have been granted by His Highness the Sultan, for working of gold, silver, lead, tin, &c. mines, both to European and native capitalists. Most of these lands were nntouched by the grantees, perhaps taking advantage of His Highness' inexperience regarding the development of a patch of gronnd for mining purposes, when the time soon approached in July last, on the most unexpected arrival of a British Resident in the State, for, every such grantee to put his respective patch of ground in proper working order and to have on the spot necessary machinery for crushing, smelting, washing &c. of all minerals that may be found on such land, and mnch more when the "Pahang State Mining Regulations" came to force at the sanction and approval of Sir Clementi Smith, Governor of the Straits, in February last, which were most ably drafted out at the approval of the British Resident, by Mr. W. P. Townson, in an Australian

tone which sounds well for Pahang. This ground possesses various kinds of metals and anriferous minerals and as it is required by a oertain clause of the regulations, if all the mines are effectively and continuously worked, this State will be the foremost in the Peninsula, and increase the Revenue of Government in abundance.

June 1st.

HIS MAJESTY THE KING OF SIAM is shortly expected at Pekan on his way from Bangkok, visiting Kelantau, Trenganu, Keta &c., Malay tributary States to Siam. His Majesty's forerunners Phya Babanuwanse and Phya Ohandrawangsa, have touched Pekan on their way down the coast of the Gulf of Siam reparing the way for their Siamese Majesty.

A DISEASE OF THE COFFEE-PLANT.

A report has been prepared by M. Adolf Vendrell, a member of Belgian and Spanish agricultural societies, by order of the Government, on a disease that has attacked certain coffee plantations in the department of Amatitlan, Guatemala. The department of Amatitlan, consisting of some 200 square miles, has an elevation of some 3,990 feet, and in former years the principal industry was the cultivation of cochineal. On the decline of this industry it was succeeded to a great extent by coffee. Owing to the impoverished state oi soil, defective cultivation (it not being the custom to manure the land), and, perhaps, the want of depth of soil, the coffee plantations of Amatitlan have not been famous, nor have these crops ever formed any great proportion of that product of Guatemsla; and in 1880 to 1882 a disease appeared on the coffee plants, to which the planters at the present time attribnte an annual loss of 50 per cent. of their crops. M. Vendrell states that this disease is an insect, nothing more nor less than a new species of cochineal * that has adapted itself to a different existence. The insect, he states, is a standing menace to the coffee industry, as at certain stages it is easily dispersed and transported by the wind to other plantations; and he implies that, although the present species does not thrive on, or affect to any great extent, luxuriant and healthy plants, yet it may adapt itself to other conditions. He recommends the intervention of Government to enforce the destruction of the insect, and suggests the manuring of the land with nitrate. It is considered questionable whether the production of coffee in Amatitlan would withstand the charges of a higher cultivation, should there be any considerable fall in the price this artiole at present controls; and also whether, without Government intervention, the agriculturists of that department would take effective measures to prevent the spread of the disease.—*Grocer.*

A NEW INDUSTRY, the manufacturing of malt vinegar, hae been etarted in Dunedin, where a firm have a plant of work capable of turning out 500 gallons a day.—*Australasian.*

TEA IN MAURITIUS.—On at least two occasions the authorities in Mauritius have asked that a Ceylon planter should be nominated to take charge of a Government experiment in the introduction of the growth and manufacture of tea. On both occasions gentlemen were recommended and appropriate ealariee indicated and we believe that each case has been with curioue discourtesy, left without reply from the sugar isle. Now we find the following paragraph in the proceedinge of the Legislative Council:—

Laying a report by the Chairmsn of the Experimental Plantations Committee, relative to the employment of an experienced Tea curer for the Experimental Farm, and requesting the Council to vote the sum necessary to permit of the temporary employment in that capacity, of Mr. J. Oorson, on the terms recommended by the Experimental Plantations Committee.

* That is, a scale insect or bug.—ED. *T. A.*]

CEYLON TEA IN AMERICA.

"As I know them, the American citizens are the most ignorant people I have met. I refer to the New York citizens. ''Tis true, 'tis pity.' I have known them now for six months."

Such is the opinion of an advocate of Ceylon tea, who dispensed samples from a "tea kiosk at the American Institute Fair, from 10 a.m. until 10 p.m." During the process the poor fellow was "in deep mental distress; his nervous system overstrained, his emotions distorted. While he smiled pleasantly outwardly, he wept and—worse inwardly, and went through a most terrible ordeal."

All of this mental contortion, emotional dyspepsia and soul torture came from a dietetic discovery. The critic says —

"I had no conception that a people could be so woefully ignorant about a daily article of diet as these people are of tea. 'Oh, 't is pitiful!' Vast numbers think it is manufactured, and I dare say they are right, for your Yankee can manufacture anything. I must give him that credit. Let us 'give the devil his due.'"

This Ceylon missionary interested in the Gospel of Tea, has come, to use his own words "to save, to teach, to educate, and to tell what tea is, to induce them to leave the ensilage, which they have been enjoying so long (Oolong tea)—to drink really pure tea, quite an unknown quantity in this country." The task is recognised as "herculean." Undoubtedly so to one who does not appreciate the relation of climate to beverages, and that the two national drinks are coffee and beer, the former being the most popular and enticing. But our oritic is heroic, and undaunted by difficulties. He tells us "the combat promises to be severe" but the effort is well backed by "British pluck, enterprise and capital," the latter indispensable and without which the Ceylon effort will be "utterly helpless." In order to keep the enterprise supplied with Ceylon gold, the tea planters are told in a letter to the *Ceylon Observer* about the efforts being made in this city to sell Ceylon teas and the difficulties to be overcome. This document is intoresting, as it affords an opportunity to "see ourselves as others see us." Our critic, after describing the store that has been opened and its manager, proceedeth to fish for the golden ducats of Ceylon, an island of which, he says, "perhaps two-thirds of the citizens of New York never heard; the remaining third probably from their hymn books," in this manner:—*American Grocer.* [Then follows a long extract from our correspondence columns. —ED. *T. A.*]

MADRAS TEA AND COFFEE CULTIVATION.

During the year 1889 there were 110 Tea plantations in the Madras Presidency with an approximate area of 7,272 acres, which yielded a total of 884,916 lb. of tea. Ninety-eight of these plantations are in the Nilgiri District, 7 in the Malabar Wynaad, two in the Madura District, and three in Bonaughi tanna of Srungavarapukota Taluk of Vizagapatam District. Although about 8½ acres have been planted in the last three estates there was no yield, in consequence of the crop not being harvested as the plant is not thriving. The average yield per acre of mature plants was 400 lb. in the Malabar Wynaad, 190 lb. in the Nilgiris and 10 lb. in Madura.

The number of coffee plantations was 15,478, with an area of 184,125½ acres and an approximate yield of 12,382,580 lb. of coffee. This industry was confined to the districts of Malabar, Madura, Nilgiris, Salem, Tinnevelly, Coimbatore, South Canara, Vizagapatam, and Anantapur. Malabar heads the list with 10,471 plantations with 90 647½ acres; Madura has 4,183 plantations with 6,065 acres; Nilgiris 695 plantations and 82,125 acres; Salem 49 plantations in the Javadi and Yelagiri hills with about 25 acres; Tinnevelly 49 plantations with 2,650 acres; South Canara has 8 plantations with about 71 acres; and Coimbatore 18 plantations with 1,808 acres. As with tea the coffee plan-

tations in Vizagapatam are confined to Bouanghi tanna. where there are three plantations over an area of 710 acres. There are two plantations in the Anantapur District, one at Sidhaghiri and the other at Madaksira. The one at the latter village was opened out during the year and is the first attempt to grow coffee in the village. The two acres planted at Sidhaghiri yielded 180 lb., the average yield per acre of mature plants being 720 lb., the best in the whole presidency. The average yield per acre of mature plants in the other districts were Nilgiris 312 lb., Coimbatore 276 lb., Madura 152 lb., South Canara 143 lb., Malabar 127 lb., Salem 76 lb., Vizagapatam 69 lb., and Tinnevelly 9 lb. Several plantations in Malabar and the Nilgiris which were neglected and decaying were taken up again owing to the rise in the price of coffee. It is expected that the out turn this year will be in advance of the results obtained last year from the same cause.—*Madras Times.*

A TURTLE FAMINE IN LONDON.

As long back as June 1st, 1887, we devoted an article in this journal to suggestions as to the possibility of developing a market for the output of the turtle fisheries in the north and south of this island. We cannot say that what was then written was productive of any appreciable effect but we are not disinclined to think that some stimulant in that direction may be afforded by the news reaching us by last mail that London has been left almost entirely without any supply either of fresh or of dried turtle !

We think it very possible that the greater bulk of our readers are unaware of the really enormous demand which usually exists in that great city for both of these articles. Leaving out of consideration the section of this demand which arises out of convivial gatherings among the wealthy classes and for the more ceremonious banquetings of the great Civic Companies and similar Public Associations, it may be said that by far the larger quantity of the turtle reaching London either in a quick or dried condition is consumed as a nourishing restorative during or after debilitating illness. Turtle soup is, indeed, one of the most constant recommendations made by the doctors at home to their well-to-do patients. The price charged for this, either as freshly made soup or as a tinned preparation, is very high, and ranges quite beyond the means of the poorer among the sufferers from illness. We have learned that in the case of a friend recovering from severe illness, he reckoned that each breakfast cupful of turtle soup cost him three shillings at least, and that for the fresh soup from Gunter's he had to pay half-a-guinea a pint. What the price may have gone up to during the late famine of turtle in London we can hardly hazard a guess. Possibly it may have risen as exorbitantly as did the price of quinine in Mauritius during the severe outbreak of fever experienced some twenty years back in that island.

Without enlarging further on this point of costliness of the article, we believe we have demonstrated how high a value may be obtained for it at home and how very steadily expanding is the demand. From some cause or other as to which we have no information, the ordinary sources of supply hitherto relied upon have of late years shown symptoms of drying up. Chiefly, the London market has been dependent upon the turtle harvests of the West India islands, and these—possibly for want of an enforcement of a close time during the breeding season—have of late become very restricted. Irish Home Rulers are fond of quoting an adaptation of an old saying to the effect that England's distress may be Ireland's opportunity. May we not plagiarize upon this, and say that London's distress (as to its turtle supply) should become Ceylon's opportunity ? We note that it is remarked that "there is but little flesh on a turtle" as the reason why the retail price is so largely in excess of the wholesale buyer's rate of purchasing. From what is known locally of the turtle in the Colombo, Matara and Jaffna markets, we should not be disposed to agree to that statement. They appear usually to us to be full of flesh, and that of a highly nutritious quality throughout. We suspect that it is the cruel system of leaving the poor creatures without food all through the long journey homewards which accounts for their shrunken state on arrival. It is much to be wished that an experiment could be made in the conveyance of live turtle from Ceylon to England. During the voyage they might be cooped as are fowls and ducks and regularly sluiced with sea water and supplied with food. It is cruel and wasting to lay them on their backs with the head hanging down during a month's journey. We believe that, with proper care, turtle might be landed in London from Ceylon in almost as good a condition as when shipped, and if that were accomplished, no more profitable venture—at least at the present juncture—could be made than that of supplying the London market from our local breeding grounds.

IRRIGATION:—A SPECIOUS BUT IMPRACTICABLE PROJECT.

The Ulsoor Tank which supplies water to the Bangalore cantonment is the subject of a letter in the *Indian Engineer.* The writer is troubled about the loss of water from evaporation but especially from absorption into the soil, described as decomposing felspathic rock, exceedingly porous and friable. The remedy proposed is thus indicated:—

Can these underground streams be tapped in any way? If there are no impermeable strata within a moderate depth from the surface cannot something be done to make the gathering ground more or less impermeable? I will cite one method, proposed by M. Seguin, which, though only generally applicable to small areas, could be modified for adoption on large areas of several square miles. I translate from Debaune's "*Distributions d'eau*" where M. Seguin's article is quoted. "Take a piece of land 3 or 4 acres in extent, where the soil is sandy, such as may be found in the Bois de Boulogne or in other woods around Paris, and which besides has a slight slope in some one direction so that you may at once get a flow of water. Excavate along its whole upper length a trench 4½ to 6 ft. deep and about 6 ft. wide. Level the bottom of this trench and make it impermeable by macadamising it or by flooring it with asphalte, or, simpler still and less costly, by puddling the bottom with stiff clay. Alongside this trench cut another similar one, throwing out the earth to fill the first one. Treat it in the same way and then continue the process till you get a sub-soil completely impervious to rain water. Plant the land with fruit trees and especially with trees with low-hanging branches; which will shade the ground and will arrest currents of air that would tend to cause evaporation. Then at the lowest level of your land build a wall down to the artificially prepared sub-soil into an opening at the centre. You will infallibly find that you have here a fine spring which will flow without intermittence." My readers may perhaps here say, "Ah ! this proposed method has quite a pastoral ring about it, but is quite impracticable on 5 square miles of drainage basin." Modified, I believe the method would be eminently practicable. Fill up all fissures on the higher parts of the basin, where fissures probably around, and then, after close examination of the ground and of the directions of flow of the sub-soil water, dig

trenches in the way suggested and make them impermeable so as to lead the water into the tank where it is so much wanted. There may be insuperable obstacles to carrying out any such proposals to increase the run off into the tank; but if there are not, an expenditure which I might calculate at R30,000 to R50,000 a square mile or 1,50,000 to 2 lakhs in all, would give a supply ample to meet the present requirements of the town and render unnecessary for many years to come larger and much more costly schemes.

We submitted the above to one of the most eminent of our many competent and accomplished hydraulic engineers, whose deliverance is as follows :—

"The correspondent boldly recommends an expenditure of R150,000 or R250,000 over what would be only an experiment, and he adduces no facts in favour of it. I should say that no one is likely to try the French proposal on a large scale.

"According to the description of the soil of the drainage and of the Ulsoor tank I should be surprised if such works as the correspondent recommends were to materially augment the existing water supply. He cannot be an engineer, or he would not write in such a child-like manner regarding the filling up of 'all fissures in the higher part of the basin.' He states that the water 'cannot possibly be all evaporated,' but he brings forward no evidence in support of this opinion. During 6 months of the year, the *total* rainfall is under 6 inches, so that in this period the soil may become parched to a great depth, and ready to act as a sponge when the S.-W monsoon rains fall.

"No doubt a great amount of water is wasted in Ceylon by passing under the embankments of the tanks, there being no puddle-trenches to intercept it. According to the correspondent's ideas it would be a very simple matter to stop to this flow and waste; but the expense would be very great,—probably more than the water is worth."

In April 1887, when, recording the impressions created by a visit to the Kalawewa tank, we specially noticed this question of percolation of water through the brands of tanks and the sides of canals, as requiring legislation such as was found necessary soon after the great Ganges canal was opened. Cultivators of lands adjoining the banks were equitably charged for the water which kept their fields perennially moist although it was not supplied directly from sluices. Nurseries of forest trees ought to exist under all our great tanks.

TASMANIAN APPLES.

(From the *Aberdeen Free Press*.)

June 12th.

Passing down Market Street yesterday I saw some beautiful apples in a fruiterer's window ticketed—"Tasmanian apples, grown and packed by S. E. Shoobridge." This is one product in which Tasmania can compete with any part of the known world. I have never seen better apples or better crops anywhere else; and, coming in at this season of the year, the export to this side ought to prove profitable. Apples will grow abundantly almost anywhere in Tasmania, but the favorite district is the Huon, 30 miles south-west of Hobart, where the soil and rainfall are pecularly suitable. The trees are planted 20 feet apart, and after the sixth year will give average crops of 500 lb. up to the 14th year, when the yield begins to fall off. The orchards of the Messrs Shoobridge are, however, on the banks of the Derwent—a rich spot such as cannot be found anywhere else in the island. Amongst the eldest colonists the father of the Shoobridges went out "of his own free will" some 60 years ago. An intelligent, upright, and downright good man, he taught his sons habits of honest industry which ought to have been a pattern to all other settlers and a fortune to themselves. While other farmers treated the poor assigned convict servants as beasts of burden and worse—frequently sending them to get lashes instead of wages due—the Shoobridges invariably treated them with kindness, were well served and well they prospered. Years ago they went into hop culture and I have seen as many as from 4000 to 5000 busy fingres picking their crops. But hops have caused to pay and these enterprising men are now turning their attention more exclusively to apples. The apple—like every other living thing—has its enemies, chief among which is the Codlin Moth (*Carpocapsa pomonella*). Like many more of our troubles the Codlin Moth is the sequel of sloth. In Europe orchards are, as a rule, kept cultivated and clean so that when an embryo moth falls from an apple a bird can pick it up, but in most of the so-called orchards of Tasmania this is impossible; and the worst of it is the most careful cultivator suffers by the garden of the sluggard.

Coloniensis.

TAMIL COOLIES AT THE STRAITS

The Indian Immigration Report for last year shows that the indentured inflow during that period stood at 2,747, a falling off amounting to 40 per cent compared with the figures for 1888. Decrease also has taken effect slightly on the arrivals of immigrants not under indenture, who reached the aggregate of 15,285. The Protector has taken measures aiming at a change for the better in this respect, and hopes to see matters further righted by curtailment of contract time and a rise in wages. In his opinion, low pay turns the weaker coolies into starvelings and incites to desertion, which also largely arises from the contract time being fixed at three years. It is alleged that the length of the term of service under the strict discipline of an estate discourages this class of coolies even to the point of death.—*Straits Times*.

THE GOLD TRUST AND INVESTMENT COMPANY:

A BIG DIVIDEND.

[We are indebted to a correspondent for calling our attention to the extract in the London *Globe* of June 6th with the above headings. The Company is a prosperous one, and as may be seen, it has been doing work for Ceylon.—Ed. *T. A.*]

An ordinary general meeting of the above company was held this afternoon at the offices, No. 184, Gresham House. Mr. P. E. Lintilhac presided, and in moving the adoption of the report, which showed that there was a balance of profit of £12,857, and that the dividend for the year was equal to 32½ per cent., said the result must be considered satisfactory when they remembered that for the greater part of the year the mining market had been greatly depressed; but still, the depreciation in the value of shares held by the company did not exceed £3,000. The company were entitled to a considerable amount of commission for making the issue of the Persian Investment Corporation, which amount was not taken into consideration in the company's accounts until received by them. The directors, after very careful consideration, had undertaken the formation of the Gemming and Mining Company of Ceylon (Limited). This company, although only issued a short time since, already looked like being a great success, and the directors had thought it wise to retain a considerable interest in the undertaking. The board might be considered rather conservative in their views, but they thought it wise not to take credit in the balance for any moneys not yet received. The shares of the company were highly

thought of both in London and on the Continent; and the £1 shares were now quoted at £12 premium. There was also every prospect of an even better dividend next year.—Mr. S. Bernard seconded the motion, which was unanimously agreed to, and the usual formal business transacted.

LOWCOUNTRY PLANTING: NEGOMBO.

WEATHER—CINNAMON—COCONUTS.

KADIRANA, July 1st.—We are badly in need of rain here. May was a dry month and June was worse; the former had 3·64 inches and the latter 1·61 inch of rain; so that for the south-west monsoon this year we have had only 5·25 inches. Even in the earlier months of the year there a smaller rainfall than usual. For the previous 4 years the average fall for the first six months of the year has been 44·50 inches, against 23·09 this year. Colombo, I see, for the same time has had over 33 inches, while the record on one estate in Veyangoda is a little over 60 inches. These three stations, all in lowcountry, and within about 18 miles of each other, show how unequal is the rainfall distribution. All estates are busy preparing cinnamon, but unless we have rain soon the peeling is likely to become difficult. Coconut crops all over the district are, I believe, better than they were last year, while prices continue to keep up. Can you say why coconut poonac has been so high in price for about twelve months past?

THE FORESTS OF EUROPE.—The forests of Europe according to a recent report of one of the State foresters of Prussia, cover the following areas:—Germany, 34,596,000 acres; Russia, 494,228,600 acres; Austria-Hungary, 46,951,700 acres; Sweden, 42,000,000 acres; France, 22,240,000 acres; Spain, 19,769,000 acres; Italy, 9,884,570 acres; and England, 2,471,000 acres.—*Public Opinion.*

THE PENANG SUGAR ESTATES CO., have recently got out a lot of machinery of the newest type for the manufacture of sugar. They have also fitted up their sugar factory at Caledonia with electric light, which was used for the first time on Saturday night and proved a great success. There are eighteen arc lamps of one thousand candle power each, which are worked by two Victoria dynamos supplied by the Brush Co. of London.—*Pinang Gazette.*

JAVA CINCHONA EXPORTS.—In respect of cinchona bark, the Java exports have been much more progressive than in the case of tea, as may be seen from the following figures:—

	lb.		lb.
1884 ...	447,000	1887 ...	2,429,000
1885 ...	1,074,000	1888 ...	3,588,000
1886 ...	1,836,000	1889 ...	4,965,400

Seeing that Java bark analyses about double the average for Ceylon, last year's export was equal to 9,930,800 lb. of our bark. During the current year, the exports of bark from Java show a further increase and may reach 5½ million.

BUCHANANIA LATIFOLIA.—Read the following letter from Surgeon-General G. Bidie:—"In the July number of the Society's Proceedings I see a brief but interesting notice of the seeds of *Buchanania latifolia.* They are very commonly used by natives as we use almonds. When Sir M. E. Grant Duff visited Cuddapah they were brought to his notice (by, I believe, Dr. Iyasawmy Pillay Rai Bahadur), and he, recognising their great merits as an after-dinner dainty, introduced them at Government House. In this way their use became more general at European tables. They have a delicate nutty flavour, and the only defect that I know in them is that they do not keep very well, being apt to get mouldy. They are known in the local market at Cuddapah as *Chara pappu bijam.*—*From Report of the Agri-Horticultural Society of Madras, Sept. 1889.*

VITALITY OF SEEDS.—I wish to place on record one instance more, illustrating this point. Twelve months ago I sowed a seed of Abrus precatorius, or the Liquorice tree. This was one of several others of the same kind which I know to be twenty-five years of age. I have had the seeds since the beginning of 1879; and the gentleman who gave them to me grew them in the West Indies, and he left there in 1855. The seed sown, as mentioned above, has vegetated this spring, and is growing vigorously.—G. PAUL, Knaresborough.—*Gardeners' Chronicle.*

AN HISTORICAL PALM TREE.—Visitors to Rome in past years who remember the gardens of the British Embassy, will be interested, says the *Times*, to learn that the Palm which stood in them, and which was not only the tallest in Rome but was historical, as having been pierced by a cannon ball during the attack on the city in September, 1870, has been blown down during a gale. It was strapped with iron where the ball had pierced it, and was the only object in the vicinity which showed the traces of the attack which opened Rome to the Italian army.—*Gardeners' Chronicle.*

PROFESSOR OLIVER.—It is with much concern that we have to announce that Professor Oliver resigns his post as keeper of the Herbarium of the Royal Gardens, Kew, at the end of this month. Professor Oliver has been connected with the Herbarium for about thirty years, and it is quite impossible to overate the services he has rendered to botany, and, incidentally, to horticulture, during that period. The Professor's modesty and retiring habits have prevented him from becoming so widely known to the general public as his merits warrant, but among botanists there is but one feeling of the highest respect for his perfectly unique knowledge, and of gratitude for the readiness with which he has always used it for the benefit of science and the public. We are glad to learn that the Professor will continue to reside at Kew, and to lend his invaluable assistance as Editor of the *Icones Plantarum* and in other ways.—*Gardeners' Chronicle.*

A SWEET ORANGE-POMELO is noticed in the *Florida Dispatch, Farmer and Fruit-Grower.* The grower writes:—

The fruit of this tree varies considerably, some individuals being as sweet as an orange and others almost as sour as the average grape fruit. Please sample these and see how they compare with the best that you have eaten. For my part, at this season, I prefer them to oranges, either sucked or cut through the equator, sprinkled with sugar and placed upon a glass for breakfast. I am strongly inclined to think them wholesome, and think that they need but to be known in order to be appreciated.

The editorial opinion is:—

The samples were very firm and smooth, though slightly rusted, but nobody could quarrel with their interiors. The only bitterness was in the core; the pulp was deliciously sweet quite to the rind, with a slight suggestion of coconut flavor.

Fancy a pomelo with coconut flavour!

PROFESSOR EISEN'S REMEDY FOR COFFEE LEAF DISEASE does not seem, from his own account of it, to have any marked superiority over Mr. D. Morris's remedy of sulphur and lime. That killed the fungus where it was applied, and this is all that is claimed for the professor's remedy. Our experience in Ceylon proves that no remedy short of complete extirpation of the ubiquitous fungus can be of any avail. The Professor had better address himself to the Government of Java, where coffee is still more of a staple product than, unhappily, it now is in Ceylon. Professor Schrottky was as fully satisfied in his own mind of the merits of carbolic acid as Professor Eisen is of the success of his simple remedy. But that is not enough. We fear the only remedy is effluxion of time and the extinction of the fungus with the disappearance of that which it feeds on. Then a non-fungus cycle may set in and coffee be once more profitably cultivated.

NORTH BORNEO NOTES:

PERSONAL—PEARL SHELLS—FLAX—SAWMILLS.

(From the *North Borneo Herald*, June 1st.)

Mr. E. P. GUERITZ who some seven years since was Assistant Resident in Kudat, and who left the service in 1884 has again entered under the Company's rule, and will take charge of Labuan, Mr. F. G. Callaghan being about to proceed to England on six months leave of absence.

In this issue we publish a most interesting lecture on the State of North Borneo its past, present and possible future given by Mr. Alexander Cook Treasurer-General before a meeting of the British Association at Newcastle on Tyne on September 10th last during his absence on leave in England last year. There is one slight correction which it may be as well to make. Mr. Cook states that during Captain Beeston's second Segama Expedition of 1887 the prospectors did not discover any "matrix" of gold but only the loose gold in the beaches. This is not quite correct. On both expeditions of 1886 and 1887 Captain Beeston successfully treated quartz for gold, finding the quartz very heavy with baser minerals. In 1887 several quartz reefs some of large width were found in the creeks above Weary George where the slate and diorite country came in. Samples from these were reduced to powder and washed a very fair prospect being the result.

It seems that attention is being given to the coast of British North Borneo as a suitable field for the pearl-shell fishing industry. The following extract is from a letter received by a firm at Thursday Island from one of the leading London brokers. The Torres Straits fishers referred to are probably from the North-West —"It has come to our knowledge that some Torres Straits fishers have been applying to the British North Borneo Company for leave to fish on the coast of that Island, and we think it well to call attention to this new ground, as we have seen some of the boldest and finest shell from there, and think it likely to have grand opportunities."

We append translation of a letter addressed to us by the Manager of the *Société de la Ramie Française*. All the samples alluded to can be seen at the office of the *North Borneo Herald*:—

Sir,—We received your letter of the 18th December and thank you for the flattering compliments with which you addressed us. According to your wish we are sending you, by this mail, patterns of ramie in the divers states in which it is utilised.

I. Stalk of dried Ramie.

II. Ramie unravelled by Chinese hand labour, and worth, in the European markets from 80 to 85 francs, per 100 k'los.

III. Ramie unravelled when green by the machine P. A. Favier, and worth in the European markets 40 to 45 francs per 100 k'los.

IV. Ramie unravelled when dry by the machine P. A. Favier, worth 70 to 75 francs per 100 k'los, in the European markets.

We add to these samples, some specimens of flax, after undergoing a certain preparation, and also some samples of tissue. We are also sending you some pamphlets appertaining to the culture and machines for working ramie. We are convinced that there is much to be done with the ramie but in a damp climate the disentangling cannot be promptly effected unless through the agency of our machinery, working it in its crude state that is to say immediately after the cutting of the stalk. If any powerful company would undertake the first cultivation of the ramie, we could easily come to an arrangement with them and would be willing to allow them the monopoly of our machinery, at the same time we would be assisting them at arriving at a result. As to our being able to give you an idea as to what revenue would result from the undertaking on a proper scale the following information may be useful. In a climate like Borneo *three* crops of ramie can be thoroughly calculated upon in one year, each crop should give from 13 to 14,000 k'los. of green stalks per acre which after undergoing treatment with our machines would give a return of 2,000 k'los of strips like the pattern herewith; we are buyers of these strips at the rate of 40 francs per 100 k'los; this would represent a gross return of 800 francs per acre. One machine with two workmen could produce 2,000 k'los in a space of from 6 to 8 days. The power of the machinery does not come up to one horse power. The royalty we should ask, to give up the right of this patent would only amount in any case to 0f. 75c. for every 100 k'los so unravelled. The material so delivered should be received free of all port charges in any European port, and the bales so delivered should average from 200 to 250 k'los to the cubic yard, the total cost of the machine amounts to 2,000 francs and we shall be very happy if this question should prove sufficiently encouraging to induce any of the companies in British North Borneo to take the initiative in developing this new industry which would certainly conduce to the profit of both grower and buyer and might develope into an industry of considerable importance. A. FAVIER.

We publish the following communication with much pleasure, as it indicates the progress of the Saw Mill industry in Sandakan at the present time.

During the recent visit of His Excellency the Governor and Mrs. Creagh to the Saw Mill and Engineering Departments of the British Borneo Trading and Planting Company, it was the general subject of remark that energy and determination combined with sound practical knowledge had worked great changes in the prospects of these Departments, during the past few months, and what was formerly a ghastly mangrove swamp with a drowned Saw Mill in its midst was gradually assuming the appearance of a business centre, all the Saw benches in the Mill being hard at work on the execution of a large order for Railway sleepers for Manila, which are being turned out at the rate of 500 per day, and for which purpose the timber is specially adapted.

The energetic Manager Mr. W. A. Leach is at present busily engaged on the reconstruction and extension of the Saw Mill Wharf, which when completed will be 550 feet in length and will allow vessels drawing 18 feet to come alongside at dead low water. Another Wharf 500 feet in length is also in course of construction for the Engineering Department and alongside of this it is in contemplation to erect a patent Slipway for hauling launches and small steamers, and which will in junction with the New Machine and Boiler makers shops and Iron and Brass Foundries enable the Company to undertake and successfully carry out extensive repairs of all descriptions. In the course of conversation with the Manager that gentleman (who has had seven years' experience with Teak timber in Siam) expressed his opinion that Billian was for many purposes far superior to Teak, and could be supplied at ⅔rds of the cost of that wood, the forests which in Siam are in some instances 500 miles from the port, being an important item in the cost of production. Kayu Kapur or Camphor, and Kruen or Borneo Teak, are also woods which in his opinion are quite equal to Teak for ship-building and other purposes and can be supplied at little more than half the cost of that wood. Altogether the Company is to be heartily congratulated on its improved prospects and there can be little doubt that when the quality of the magnificent timber which abounds on the property of the Company, becomes more generally known, the present Milling plant will have to be further increased in order to supply the demand which will certainly exist for it.

The Government is corresponding with more than one of the leading members of the Western Australian Pearling industry who want to bring up a fleet of schooners to fish on our East coast during the Australian winter months when the inclemency of the weather prevents them from leaving the ports of that colony. For the information of those who are interested in the business we may say that the first comer has been offered the privilege of exporting pearls at half the ordinary export duty (*i. e.* at five instead of ten per cent) for seven years from the date he starts business. This privilege covers a fleet not exceeding twenty ordinary pearling schooners. Not only the mother of pearl shell of very fine quality, but also the real pearl oyster have been found off our East coast, but neither variety is regularly fished: both inhabit deep water and none of the natives understand dredging.

The Government is endeavouring to attract some of the pearl dredgers from Sulu but hitherto although they accepted the terms offered they show no disposition to come although some of their chiefs believe our East coast to be quite as rich as any other in the Sulu Sea.

CEYLON UPCOUNTRY PLANTING REPORT.

WEATHER — PEPPER-GROWING — LIBERIAN AND COORG COFFEE—ARABIAN COFFEE FREE OF LEAF DISEASE THIS YEAR.

July 4th.

Our present weather is simply too much of a good thing, and although Ramasami pretends to be up to a dodge which could bring about a change —that of having a day's outing with Muniandi, at the master's expense, rain to be certain after that!—things have not reached that point of despair with us yet, that would justify the adoption of it. Nevertheless it looks very like as if the south-west monsoon of 1890 was to be lost to Ceylon. It does not tend to make matters any more bearable to hear that other places were getting their S.-W. rain all right; and that at sea the weather is heavy with rain and to spare. Our monsoon must have gone galavanting somewhere, breaking through its character for steady respectability by thus adopting a profligate career. I wish it would repent and come back. It would be as welcome as the prodigal, and as rejoiced over. In these districts our streams are getting lower and lower, the rains we have had, proving wholly insufficient to meet the strain of such dry weather immediately after the hot months: plants which have been put out, are having a terribly rough time of it, and except that tea is flushing, all the usual work at this season might be said to be at a stand-still.

We will know 'All About Pepper' by and bye. Meanwhile some who have tried it, as an auxiliary to other things, are not so very enthusiastic as they were. A good healthy pepper vine is found to be more than a match for a sturdy jack, and seems to be capable of sucking the life out of it. In time the jack will show nought but bare poles after a struggle for existence, more or less prolonged. Some of us had not quite calculated on this masterful spirit on the part of the pepper and would have preferred to have seen a willingness to live and let live.

It becomes a question worth considering, if in a place where shade is needed, and pepper for a time may be successfully grown, it is wise to grow it and run the risk of having your needful shade killed out? Will the profit made by the pepper compensate? I don't pretend to be able to answer these questions; but there is no harm in asking them.

The under-current in favour of Coffee still flows vigorously, and especially the one that makes for the Liberian variety. Every now and again you fall in with a man who has been agreeably surprised by what his Liberian coffee has done for him, and who is doing a little extending on the quiet. It wants so little culture, and can stand such an amount of hard usage, that Liberian coffee might have been expected to have been a favourite with the Sinhalese villagers. I fancy it is the trouble of planting which prevents its taking its place among the village favourites. If it had not had such an abominable bark-like pulp, very likely the monkeys would have proved useful, and gradually extended the cultivation! Coorg coffee too is being tried more extensively than it has been for some time, but what is it after all? Pretty much a kind of planting dilettanteism. A man gets over a bushel or two of seed, and a few acres are put in, but the full-hearted loyalty which was given to king coffee in the days of old, has died out.

Coorg coffee seed comes up well, and if all who have ordered this variety have had as excellent results, as I have seen in nurseries grown from seed procured from Mr. Hunt of Mercara, they must be fully satisfied. Every seed seemed to have germinated, and the plants were vigorous and strong.

By the way what there is remaining of Arabian coffee has been singularly free of leaf disease this year. Not that the old enemy is not about, it is still there, but the old force seems to be diminished. Perhaps the abnormal season we have been passing through may have something to do with it.

Peppercorn.

COCONUT PLANTING IN CHILAW DISTRICT.

SUSPENSION OF ST. ANNA'S FESTIVAL THIS YEAR RIGHTLY URGED IN VIEW OF PREVALENCE OF CHOLERA.

Rajakadaluwa, Chilaw, July 1st.

The S.-W. monsoon has been almost a failure as regards rain, and while this is hard on vegetation (though our young trees are standing it remarkably well) the dry weather is all in favour of felling operations, which are pretty general throughout this part. Coolies are already talking of "St. Anna's" pilgrimage: surely Government will find it *convenient* to stop or restrict the festival for this year, on account of the fearful reports from Southern India. To have our labour enticed away at a busy time is bad enough, but of this we don't complain: the real grievance lies in the needless risk incurred of a general epidemic; and it seems almost miraculous that we have been so mercifully spared each year, so far. An outbreak of cholera would be but a poor commentary on physical cures said to be effected at St. Anna's shrine.—The coconuts hereabouts on the last clearing are giving great promise: they are better than any I have seen yet at that age.

INDIAN FISHES.*

[We have been meditating a notice of the book referred to in this review, but we feel we cannot do better for publishers or readers than quote the remarks of the writer in the '*Indian Agriculturist* —Ed. *T. A.*]

A melancholy interest attaches to these volumes. When the Secretary of State for India determined to authorise the publication of a series of compendious handbooks on the vertebrate fauna of British India at a cost which should place them within the reach of all likely to be interested in such subjects, the fishes were committed, as a matter of course, to Dr. Francis Day, late Deputy Surgeon-General of Madras, the greatest living authority on the subject. He took up the work with characteristic enthusisam, but a life spent in brilliant and scantily recognised services to the cause of science was even then drawing near its close. In pain and weakness he laboured on, finished his manuscript, and corrected the proofs of the first volume. Then he was obliged to desist, and almost on the day when that volume issued from the press he passed away. The second volume was put through the press

* "The Fauna of British India, including Ceylon and Burmah," published under the authority of the Secretary of State for India in Council, edited by W. T. Blanford. "Fishes," by Francis Day, C.I.E., LL.D., &c., Deputy Surgeon-General, Madras Army (retired). Taylor and Francis, Red Lion Court, Fleet-street, London.

by the editor of the series, Mr. W. T. Blanford, who apologises for possible mistakes or omissions, but his name is a guarantee that the work has been as well done as it could be.

It would not be an easy task for us to criticise from a scientific standpoint, the work of one who was *facile princeps* in his subject, and happily it would be quite out of place to attempt such a thing in these columns. We have to consider the book from the point of view of those in this country who will make use of it, and if the number of Anglo-Indians who concern themselves about fishes (as distinguished from *fish*) is unfortunately very small, nothing is more likely to increase it than a clear well written manual, not too bulky to carry about, and not too costly to buy, which will enable any one, with a little trouble to indentify and name the most important or remarkable forms which may come under his observation. With such a help we venture to think that many will be tempted to take up a subject which in point of intrinsic interest is scarcely second to any. A visit to the neatly kept little collection in the rooms of the Bombay Natural History Society will convince any one that whether the cast of his mind inclines him to the beautiful, the strange or the grotesque, there is a boundless field of interest before him in the fishes of India. And if we turn from the æsthetic or curious to the purely utilitarian aspect of the subject, it must be admitted that the study of fishes is beyond all question of more importance to mankind than any other branch of natural history. It is difficult to realise the extent to which the people of this country depend upon the never-failing harvest of the sea. All down the coast of this Presidency where rice is the only grain in use, and beef involves damnation, and mutton can scarcely be had, all except the highest castes of natives subsist largely on fish. In Canara, even the Brahmins, though they may not willingly avow it, are well known to resort very freely to a diet which is almost the only alternative from rice *congee* and cocoanuts. Besides what is eaten in a fresh state, enormous quantities of fish are salted or sun-dried, or cured with salt-earth and exported to other parts of India or sent up the Ghants for consumption inland. Fish cured by simple exposure to the sun becomes, as most of us have had occasion to know, highly aromatic, and is much esteemed by the natives as combining the qualities of nutritious food and an appetising condiment.* Mahomedan sailors seem scarcely able to imagine that life can be sustained without it, and all who love to go a-sailing in Bombay harbour on a balmy summer evening soon learn to shun the leeward of the native anchorage at the time the *molles sabæi* of the Arab buggalows are preparing their evening meal. Along with the fish, which are dried for food, are vast quantities of very small fry, which are sold by the maund for manure. Then there is a considerable trade in the fins and tails of the shark-tribe, which yield gelatine, and are much prized by that eccentric epicure, John Chinaman. Finally, fish oil is manufactured on the coast more extensively than is generally known. There used to be a factory at Calicut for making oil from fish livers, which was under Government management. At this factory according to Dr. Day, no liver under 40 lb. weight was accepted, and he mentions one single liver which weighed 290 lb. Who can forbear to sympathise with that fish ?

So far we have referred only to marine fisheries but every river in India, large or small, is incessantly worried with nets and weirs and traps, and here it is that the knowledge of the ichthyologist becomes of most value in detecting and devising means for counteracting the ruinous results of ignorant selfishness. For many of the fishes most valuable to man, like the salmon in Europe, spawn in fresh water and annually ascend rivers and streams for the purpose. In the sea they are only casually within the reach of man, but when they come into the rivers they are at his mercy, and he has none. He builds weirs and dams which render it impossible for any spawning fish to go up the water or else he contrives arrangements of nets which absolutely exterminate the fry as they come down. The wanton mischief done in these ways in India has been incalculable. The remedy is generally very simple when the habits of each species are properly understood. Weirs intended for purposes of irrigation can be rendered harmless by "fish ladders," which allow the fish to ascend at spawning time, and by forbidding the use of nets with meshes below a certain size, small fry, which are useless for food, can be saved and allowed to grow. It is possible, also, to do much good in a positive way by stocking waters with the most valuable kinds of fish, and taking measures, as far as possible, to exclude predaceous species. The attention of Government has lately been drawn to the matter, chiefly through the influence of men like Dr. Day and the well-known author of "The Rod in India"; but as far as this Presidency† is concerned, we do not know that anything has been done beyond "inviting opinions." At any rate, there is very much yet to do, and since accurate knowledge must be the basis of every successful measure, every Englishman in this country who turns his mind to the habits of its fishes may assure his conscience that he is serving his generation.

There remains the domestic side of the subject and this must not be passed over. We ought to know more than we do about the various kinds of fish which come to our table or which might come there. It is a sad fact, too characteristic of the Englishman in India, that of all the edible fishes to be had in the Bombay market there are only two for which we have yet

* A diet of such fish has been adduced as one of the chief causes of leprosy.—ED. *T. A.*

† Bengal.—ED. *T. A.*

HOW TO GAIN IN WEIGHT.

ALBUMEN (*i.e.*, materials like meat, gluten, casein, white of egg, &c.) is the food which makes flesh, and a certain amount of it is made up in the system every day, no matter whether any of it is taken or not, and no matter whether work is done or not. It seems, then, that albumen is most closely associated with the vital processes, and a man will die sooner when deprived of meat than of any other food.

Now, to increase the flesh a full supply of such food as meat, gluten, &c., is absolutely indispensable, and, if it be given with plenty of fat and starchy or saccharine food, will increase the weight. In low states of disease the most useful food is meat, but as the ordinary meat-teas do not contain the nutritious part of the flesh, zymine should be employed to digest out the insoluble ingredients.

A practical question is,—Why do people who are taking a goodly amount of cod liver oil grow thin ? It is because they take too little meat. To do most good, oil should be combined with farinaceous food, as butter on bread. The endurance of fat-eating people is proverbial, and no other food will yield the force that fat will. Therefore it is that in wasting diseases recourse is had to cod liver oil. Because the oil has been given as a medicine it has oftener disagreed than it would otherwise have done.

The new form of cod liver oil may be counted among the more recent medical innovations. Formerly it was the custom among physicians to prescribe this oil in emulsions. These emulsions were manufactured with alkalies, which, with essential oils, made them soapy or heavy, and, therefore, bad for the stomach. Now it is the order of the day to give cod liver oil with a food, such as malt extract, and not with drugs. Consequently, a revolution has taken place in the dietetic treatment of consumption, scrofula, &c.

The initiative of all this was the discovery that cod liver oil could be dissolved in a good malt extract, and the Kepler Solution of Cod Liver Oil in Extract of Malt is now prescribed by physicians everywhere. It will fatten where cod liver oil would do no good, and where the person does not seem to be gaining so fast as is desired, see that plenty of meat is allowed, and success is morally certain ; that is to say, there will be increase in flesh and fat, consequently, gain in weight.—"*Health*," London.

found names *viz.* the Pomflet and the Bombay Duck. There are a few more which the Boy introduces to us under such title as "Lady Fish" and "e-Slic Fish": but he is, above all things conventional and tries nothing new. It will be in the memory of epicures that an enterprising secretary of the Bombay Club a few years ago introduced to the members of that institution a species of mackerel, which immediately rose into favour. It is one of the commonest fish on the west coast, but the club servants could scarcely be induced to bring it from the market. "It is not food for *sahebs*," they said. And how few of us suspect that a true sardine swarms on this coast, which according to Mr. W. F. Sinclair in a recent paper in the journal of the Bombay Natural History Society is far superior to the tinned article.*

These and many others we find in Dr. Day's book, with a passing comment on their edible qualities; but unfortunately the plan of the seriess necessitated so much compression, that miscellaneous matter had for the most part to be compressed out altogether. What was essential was a clear, concise, and yet complete description of every species, with such synopsis of families and genera as would enable the student to trace his specimen to its place in the system. This part of the work is done in a masterly way and illustrated by a very large number of beautifully executed drawings, which will aid the beginner more than anything else could have done. We regret to see that there is no attempt at any English index. Such a thing would have been very unscientific, but any book which appeals to the Anglo-Indian public, in its present state of advancement, must condescend to be unscientific. Anyone, however, who means to go into the subject even superficially will find it a profitable exercise to make his own English index, and also an index of native names for the district in which he resides. Our notion indeed of the best way to use a book of this kind is that it should be interleaved and converted into a note book for recording personal observations.

It only remains to say that the book is beautifully printed on good stout paper, and the binding is not showy, but substantial, and workmanlike, as befit a book which ought to be constantly under references.

JAVA PLANTING:

DISEASE IN SUGAR-CANE—COFFEE—RICE.

Consul McNeill reports as follows to the Marquis of Salisbury on the trade, commerce, and general matters relating to the Island of Java for the year 1889:—

EXPORTS.

SUGAR.—The past year has been quite an abnormal one, owing to the unprecedented continuance of the wet monsoon during the months of May, June and July which has exercised a very unfavourable influence on the outturn of the crop, and caused it to be a late one. The quality of the cane also suffered very considerably from the rains and from the "sereh" disease, which appears to be spreading in the eastward residencies, in spite of the planters' efforts to check it. The import of Borneo cane has not proved such a success as was anticipated and many planters are now contenting themselves with planting in the infected district sound cane procured from other parts of the island, where the disease has thus far not shown itself.

In the first months of the year it was expected that shipments would begin at an unusually early date; but owing to the inclemency of the weather at the commencement of the milling season, and the consequent delay in the grinding operations, deliveries were very late in arriving at coast stores and exporters who had concluded forward contracts for early shipment experienced great difficulty in carrying them out.

The past year's production, exclusive of molasses, amounted to 332,998 tons, as compared with 355,334 tons in 1838, and 375,784 tons in 1887, thus showing a decrease of 22,336 tons on last year.

* The seir fish is common in the Calcutta as well as be Colombo market, and the sardines referred to bound in the seas around Ceylon.—ED. *T. A.*

The exports to various countries of the sugar-crops during the three years previous to 1889, exclusive of molasses, were as follows:—

	1886. tons.	1887. tons.	1888. tons.
Europe ...	242,359 ...	250,036 ...	175,141
Australia ...	13,486 ...	17,269 ...	26,175
China ...	59,944 ...	72,848 ...	85,148
America ...	5,657 ...	5,891 ...	39,208
Sundries ...	26,195 ...	11,073 ...	12,779
Total ...	346,641	357,117	338,451

Of the 1889 crop the following quantities in tons had been exported on December 31st last:—To Channel for orders, 62,996; to Port Said or Malta for orders, 84,180; to an Iberian port for orders, 3,468; to Marseilles, Genoa or Ancona, 10,072; to Australia, 20,208; to China, 31,210; to America, 22,980; to other ports, 7,169; total, 242,283.

The so-called "sereh" disease in the sugar-cane, which has appeared to such an alarming extent in Java since 1883, continues to be a source of much anxiety to planters. Commencing in the Cheribon residency, the disease gradually extended its ravages, proceeding eastwards, attacking the residencies of Tegal, Pekalong, Samarang, Solo and Djocdja. In 1889 it also made its appearance in a sporadic form in the east end of the island, in Madiven, Djomhang, Modjokerto and Sidhoardjo, but in these districts the disease did not perceptibly affect the production of sugar

The disease manifests itself in the following manner, viz:—The joints of the cane remain very short growing much closer to one another than in the healthy plant; this causes the leaves to grow more closely together, thus presenting the appearance of a fan. The buds on each joint swell up and burst, forming new shoots, which in their turn produce others. Further, around the joints of the diseased canes fibres are frequently developed, similar to those at the root of the plant.

From the cane-shoot used for planting several canes spring up as in the healthy plant, and in the earlier stage of the disease one or two of these canes generally die off, whilst the remainder continue growing in the usual manner, and the presence of the disease is then only to be detected by the fibres growing around the joints, and by the swollen appearance of the buds; when the disease shows itself in a more palpable form the canes one by one stop growing, and remain poor and stunted; whilst in the worst stage of the disease the plant shows nothing but leaves, and the cane speedily dries up and dies. In the diseased plant the roots are invariably poorly developed, and harbour a parasite in the form of a microscopic worm (*Tylanchus sacchari* or *Heterodera radicicola*), the same worm which is found in the roots of many plants in Europe.

The opinions as to the origin of the disease are very conflicting, and even the most competent persons cannot agree on the subject. Of all the reasons assigned as being the cause of the disease, however, the following are the two most probable:—1, That the disease is of an infectious nature, and has its origin in bacteriæ. 2. That the disease is caused by the small worms which specially attack the weakest roots, work their way in, and thus prevent these organs performing their proper functions of giving life to the plant.

As regards this last opinion, should the question arise as to why these parasites did not appear in former years, or at least did not affect the roots as is at present the case, it is contended that probably the worms formerly existed in other plants, and gradually worked their way into the sugar cane, upon which they have thriven and multiplied, the canes offering a large field for their depredations.

The susceptibility of the canes for the operations of these parasites is attributable to the weak condition of the canes, which is ascribed to the planting and replanting of cane-shoots in the place of seed, coupled with a too intensive cultivation. Weakness owing to planting irrospective of sex has been frequently experienced, as, for instance, the poplar in Europe. As regards the treatment of the disease, the supporters of

the bacteriæ theory have attempted to destroy these insects by soaking the shoots in a solution of sulphate of copper or sublimate, which has so far met with little or no success.

On the other hand, the supporters of the worm theory have attempted to kill these parasites in the ground by means of sour sugar syrup, or the so-called Trisulfure de Carbone of Robart, which latter treatment has given so far hopes of good success. In the absence, however, of any actual remedy for the disease, large quantities of cane cuttings from healthy canes are imported from places where the disease has not made its appearance.

This measure is naturally a very costly one, and in the residency of Djockdjokarta alone fl.500,000 were spent in this manner in 1889; this is, in the meantime, the only course to be adopted, although it is now very difficult to find grounds which have shown no traces of the disease. In the last few years a large extent of grounds has been planted out in Borneo in the hope that this cane would prove impervious to the disease; but this hope proved illusory, as germs of the disease appeared on the freshly-improved cuttings, whilst cuttings obtained from this cane, after planting in Java, gave 50 per cent. diseased plants. Attempts to obtain healthy cane from the Straits were equally unsuccessful, as the "sereh" has also appeared there, whilst traces of other disease were also found in these canes, and imports from this district were accordingly strongly discouraged. At present planters are growing canes in the hilly districts of Java in order to get cuttings, and the results obtained from this cane are encouraging.

Should bacteriæ, however, be the cause of the disease, it is feared that no remedy will be found, and that the disease will have to run its course just as any other epidemic, until it gradually dies out and disappears. If, on the other hand, it is caused by the presence of the worm in the roots, the experiments already made go to show that there is some hope of successfully combating the disease. At present it may be said that the disease is decreasing in the districts where it first made its appearance, of which proof is given by the increased sugar production in the westward districts.

In the latter half of January a meeting of planters and merchants interested in the sugar industry was held at Samarang in order to frame measures to be taken against the "sereh" disease, and to discuss matters of general interest. This Congress afforded planters an opportunity of exchanging their views, but so far no unanimous course of action has been resolved on. A plan was formed to obtain the services of a specialist from Europe to investigate the causes and means of combating the "sereh" disease, but owing to the necessary funds not being forthcoming it proved impracticable to carry out this project.

COFFEE.—The leaf disease, referred to in my previous reports, continues to prevail in middle Java. More encouraging reports are circulated regarding the course run by the disease in the east end of the island, where it is averred that, except in a few of the old low-lying plantations, the disease has disappeared. The Government crop amounted to 583,458, against 564,586 piculs in 1888, and 254,058 piculs in 1887. Heavy rains and strong winds have caused much damage to the coming crop, which it is estimated will not exceed 400,000 piculs Government and private together, and in some quarters it is doubted whether this figure will even be reached.

RICE.—Want of rain in the beginning of the year seriously interfered with sowing, and affected the outturn of the crop. At one moment fears of a famine in some districts were entertained, and several small lots of foreign rice were imported by Chinese firms. Prices ruled high during the year. Prospects for the coming crops are favourable.

TOBACCO CROP has been a full one, especially as regards scrubs, for which description higher prices have been obtained than usual.

COPRA.—The development in the production of this article had the effect of driving up the price of coconut oil, as a result of which less copra was brought to market.

COCOA has been planted on a small scale in some of the mountain districts, and the yield of the trees, though small, was satisfactory as regards quality. The plantations are being extended in Middle Java, but it is still doubtful whether the cultivation will assume large proportions, as the plant only thrives on a very few estates, 135 bales, weight unknown, were shipped from Sourabaya, and nearly 40 tons found their way to Samarang, of which about 4 tons found their way to Singapore, and the balance shipped to Holland. The export from this port was unimportant.

CINCHONA.—An increase of 642 tons in the exports of this article can be reported, the figures being for 1888 1,990 tons, for 1889 2,632 tons. Owing to low prices ruling at home results have not been satisfactory.—*L. and C. Express.*

A GRAND MANGO SEASON.

It is a wonderful season for mangoes. They were selling at Galagedara the other day at eight cents a hundred, and of a good edible kind, and later on when they were said to be going out, I bought them at Teldeniya at 12½ cents the hundred. The natives usually couple a good fruit with a sickly season, and it is true in the present year but strange to say the sickness preceded the coming in of the fruit.—*Cor.*

REMARKS ON THE STATE OF BOTANY IN CEYLON.

WITH REFERENCE TO THE KNOWLEDGE OF IT IN APRIL 1843, AND AN ATTEMPT AT ARRANGING ITS FLORA AS KNOWN TO MOON AND RESIDENT BOTANISTS ACCORDING TO LOCALITY AND ELEVATION, COMMONLY CALLED GEOGRAPHICAL DISTRIBUTION OF A FLORA.

BY CAPTAIN CHAMPION, 95TH REGT.

GEOGRAPHICAL DIVISION OF PLANTS IN CEYLON.

(*Continued from page 61.*)

From this Table 2, it will be seen that various fruit trees of the tropics thrive on the coast which are less abundant or altogether disappear in the Kandyan Country. The Palm trees are also for the most part different. Coconuts thrive in the greatest perfection and become the leading feature of the Coast: sufficiently numerous to form topes: there are a considerable variety of the Coconut-palm—they have been mentioned by Bennett and other writers. The features of the jungle present but little change for the extent of table land running sixteen miles into the interior, when the country changes and becomes hilly and we are gradually brought into scenery the component parts of which are mentioned in Table 3. It seems to be similar in its Flora to that of the Circar Hills in India—Of indigenous fruits of any value, there are few; but the fruits of China and the Archipelago and many vegetables are cultivated with success. The stranger will be struck with the Talipot tree and want of the Coconut, except near villages and also with the Aleurites or Kækuna, the foliage of which has the peculiarity of appearing white after rain amongst other jungle trees. Its nut is much used for expressing lamp oil by the natives. Two species of Bramble will also be hailed as an approach to a colder climate, most of the plants and trees in this table will be found on the under features of the hills on the banks of the Mahavilla-ganga, whilst on approaching the higher hills, some of which are mountains 4000 to 5000 feet above the level of the sea, we come to a forest vegetation, the details of which are in Table 4. Trees are no longer in those heights festooned by Convolvuli and Ipomœas and Lorantie are less numerous; but their place is supplied by many a lovely air plants and the mag-

nificent Solandra oppositifolia. On the summits of these hills are found beautiful and rare plants—Begonias, Martyniae, Didymocarpus, Aginetia, Acrotræma, delight in the cold and shady precipices. The Betle-Palm is here exchanged for a Caryota bristling with thorns. On reference to a map it will be observed that the ridge of hills, between Kandy and Gampola extends towards Rambodda so that most of the vegetation passed in travelling to Rambodda may be observod in a couple of hours' walk from Kandy to the top of its highest hills, which have nearly an elevation equal to that of Rambodda. Table 9 will however add a few other particulars, and leaves us now to comment upon the colder portions of the Island or its highest mountains, in which examples are given of the Nuwera-Ellia Flora in Table 6 and the Flora of Adam's Peak in Table 7.

The Nuwera-Ellia country is a series of small plains, surrounded by hills and mountains thickly clothed with jungle to the very summit. Its elevation above the level of the sea is about 6000 feet. Its highest mountain—the Pedro-talle-galla, rises to 8000 feet. Its soil is very black and turfy in the plain, being either marshy or reclaimed marsh—The slopes of the hills turn into meadow land. Before reaching the jungle, a curiously disposed and natural hedge of shrubs intervenes—it extends with great regularity, and is a very peculiar feature in the country. It were erroneous to suppose that either the climate or productions of Nuwera-Ellia are European—but it is our alpine tract and in losing the Palm, the Cinnamon and a thousand of the ornamental trees and shrubs of the Coast, we forget the tropics. In Europe, the gradations of Winter and Summer have a most powerful effect on the system of all perennials. In Winter the leaves fall —the tree is denuded of all its ornaments. In the mass of vegetation, the sap refuses to flow until the genial return of spring: the woody tissues harden and give rise to those concentric rings or zones, by which the Carpenter can calculate the age of his timber. But as Summer advances, the sap returning induces a fresh growth and the formation of flowers and fruit—The absence of a well defined winter is therefore the great difference between Nuwera-Ellia, and our native land, and a simple answer to the query, Why do not the large Cherry trees of its gardens produce fruit? In vain do we look for a single tree (unless introduced) of genera indigenous to our English climate: the trees, although not those of the Coast, are still those of the tropics—they are however of hardier growth, usually evergreen and adapted to our Alpine region, where frost excludes delicate species and the sun rarely shines except during the earlier months of the year. Analogy from such inferences leads us to expect the annuals of our Summer which die during the Winter season and the plants of our marshes, and accordingly I have to mention genera familiar to the British Botanist intermixed with Alpine Indian Plants. The sweet little Hairbell is perhaps as grateful to us from association as the curling smoke of cottages rising over the jungle. The European genera are Andromeda, Vaccinium, Ranunculus, Thalictrum, Anemone, Viola, Rubus, Frograria, Berberis, Scutellaria, Lysimachia, Polygonatum, Plantago, Lobelia, Cynoglossum, Alchemillea, Rhododendron, Magnolia, Potentilla, Hypericum, Impatiens, Monotropa, Neottia, Orchids, Drosera, Dipsacus, Valleriana, Utricularia, Campanula, Tradescantia, Oxalis, Polygala, Gnaphalium, Rhinanthus, Euphorbia and some others—most of which have species growing in Great Britain. The character is scarcely Hymelayan, but I am inclined to believe that its Flora accords so closely to the tract of land on the Neilgherries that three-fourths of either would contain the same species. We have not their rose it is true, which is described as very beautiful festooning trees, but in either the Rhododendron nobile forms the ornament of the plains. From the elevated portions of Java there seems to be a marked difference in the absence of Oaks and Chestnuts and of course of various other productions.

The Plains of Nuwera-Ellia are very destitute of trees with exception of the Rhododendron. It is very beautiful when it flowers from May to July—the scarlet blossoms are relieved by the brown inside the bell of the Corolla and by the silvery undersides of the stem leaves—at other seasons it is a dingy tree like the Apple in height, with crooked knotted trunk, varying from 10 to 15 feet or even 25 and 30. When Arboreta shall have been introduced and Villas in Nuwera-Ellia, we may expect gardeners to give us many pretty shrub varieties of this tree with English species. Lord Carnarvon gained a celebrated Mule species by fertilising R. Cataubriense with the Himalayan sp. R. Arboreum. It retained the flowers and color of R. Arboreum and had the leaves and hardiness of constitution of R. Cataubriense.

I have already remarked that S. American species of plants became naturalised with great facility in the lower tracts of Ceylon—such is the case at Nuwera-Ellia with the productions of New Holland, and almost all the other trees of its plains have been introduced from that country by Europeans. Of the jungle trees, scarcely any thing is as yet known, but some are doubtless those of the Kandyan hills, and of the rest a few, and these good ones have been discovered. I was fortunate in finding an arboraceous vaccinium—a sp. of agapetes with pink flowers. A description of the genus will be found in a letter from Dr. Wight to Sir W. Hooker, dated Pulney mountains. There is a beautiful tree creeper belonging to the Melastomaceæ, possibly a Medinilla, Blume;* the balsams of those hills are certainly of 8 or 9 different species, some are of great beauty and size, and one species forms the entire under shrubbery of many hills, as well as the Nilla, which is a didynamious plant. Air-plants and magnificent ferns abound and dwarf bamboos—on the rocks, mosses and from the trees white mosses drenching in the drifting storms add to the wintry aspect. The Kino tree, both red and white, is much used for firewood. I am not acquainted with its botanical name.

Europeans have cultivated several of our English vegetables with success, most however requiring to be renewed from England or the Cape after some years. Potatoes and Cabbages are really source of profit and of importance to the residents of the lower orders. The Cape Gooseberry (now naturalised) makes an excellent tart fruit with the wild Bramble. English fruit trees probably require great care and particular mode of culture to produce fruit, hitherto retardation of the sap has not been attempted, or if so successfully practised, but it seems to be the key to success. They should try fruit trees from New Holland and New South Wales and the Raspberry and Gooseberry from England.

Mr. Stewart Mackenzie judiciously tried the introduction of the Tea plant, I have not heard with what success, or what steps had been taken to insure the climate and locality it is used to.

From a perusal of Mr. Robinson's account of the Tea plant in Assam, the plant appears to be of hardy character with respect to climate. I am inclined to believe that that of the Kandyan hills would be very suitable, having very much the Assam style of vegetation—possibly better than Nuwera-

* The blaze of rose-coloured flowers on this creeper which always runs up a tree-trunk, forms one of the most beautiful sights in our Ceylon jungles. —Ed. *T. A.*

Ellia. The great difficulty however exists in a locality. The requisites are excess of humidity amidst forests of dense jungle, where it grows in ravines and hollows near rivulets or pools of water. The soil should be light and porous, yellow or yellowish red over sand: it contains no carbonate of lime and the iron of the soil is almost wholly in a state of carbonate of iron—hence even in Assam and China tea-soils are comparatively of rare occurrence. The plant requires much rain and a bright sun.

I am not aware that Hops have ever been attempted to be introduced at Nuwera Ellia, they surely would succeed. As the neighbourhood is becoming more populous, possibly a Brewery might succeed.

That the grasses at Nuwera Ellia are of very inferior quality seems notorious—but surely are capable of great improvement. Were their quality good, the country is well adapted for pasturage—Cattle and Horses have great animal spirits, and there are no leeches. Vetches of different kinds are also appropriate to the climate.

The Flora of Adam's Peak is probably entirely similar to that of Nuwera Ellia—but not having level ground near the summit of the Peak, many of the meadow flowers have to be excluded, and possibly there are species which do not exist in the Nuwera Ellia country, for instance a new Monocera or Elæocarpus with purple fruit and entire leaves. The existence of species of Magnolia is an interesting feature. It however is probable that all the Indian Magnolias should be classed with Michelia. The existing sp. (two in number on the Peak) have the type of Magnolia punilla.

It was my intention to have added a list of descriptions of Rare Plants not named by Moon, but those daily increasing, I shall reserve them for some future opportunity, when our knowledge of what has been done by Indian Botanists is greater, which will prevent the confusion that might otherwise exist.

In conclusion, one word respecting the Government gardens. Let bye-gones be bye gones, as is said in the North. Little undoubtedly has hitherto been done, and some of the leading requisites have been neglected and the Gardens require great attention and severe application from its new Superintendent to place them on the footing they ought to hold—but thanks to the liberality of our present Government, the aspect is beginning to change, and *order* will soon rubbish out the many rare plants and trees which are at present unnamed, and consequently unknown both in the gardens and in the beautiful series of drawings which have been amassed from time to time without name. Let us therefore hope to see Peradenia re-established as Kew has been in the—40's, and a taste for Botany revive in the Island, and when our Indian friends find we are really in earnest—they will not be backward in imparting to us the many treasures yearly added to their own gardens, and in shewing us how many neglected resources of wealth or utility exist in what is at present,—Unreclaimed Jungle

Kandy, May 29th 1843.

TABLE 1st.

GENERAL FEATURES OF CEYLON VEGETATION.

Plants which being common or growing in masses form the general character of vegetation; from the Coast to an elevation of 2,000 to 3,000 feet above the evel of the sea.

General temperature 70° to 80° Faht.

1. Predominating Tree like Plants.

Dillenia Speciosa, Aquatica & Sp. Annonaceæ Sp. Terminalia Catappa and Sp. Memycylon ramiflorum and Sp. Psidium pomiferum, Syzygium caryophyllum, Eugenia Sp. Jambosa vulgaris and Malaccensis, Calophyllum Inophyllum, Sterculia Balanghas, Bombax Malabarica, Eriodendron anfractuosum, Pterospermum subetifolium, Thespesia populnea, Elæocarpus serratus, Grewia Sp. Citrus decumana, Limonia arborea and Sp. Glycosmis Sp. and others, Aurantiaceæ, Croton Moluccanum, Euphorbia antiquorum, Erythrina Indica, Cæsalpinia Sappan, Poinciana Pulcherrima, Moringa Pterygosperma, Bauhinia tomentosa, Semecarpus Anacardium, Anacardium occidentale, Mangifera Indica, Morus Indica, Ficus, glomerata, Religiosa, Indica, Elastica and others, Celtis orientalis, Artocarpus integrifolius, Incisa, Pubescens, Cassia Sp. Hernandia sonora. Cinnamonum Sp. Morinda citrifolia, Clerodendron infortunatum, Callicarpa lanata, Vitex trifolia, Negundo and Sp. Tectona grandis, Tabernæmontana dichotoma, Plumeria acuminata, Borassus flabelliformis, Areca Catechu, Caryota urens, Cocos nucifera, Musa Sp. Pandanus odoratissimus and Sp. Bignonia Sp. Meliaceæ, Metroxylon Sagus, Carica Papaya, Bambusa arundinacea, Tamarindus Indicus, Ricinus communis, Bixa orellana, Spathodea Indica.

2. Predominating Shrubs and Plants.

Cissus and Vitis Sp. Osbeckia Zeylanica and Sp. Mukia scabrella, Coccinia Indica, Langenaria vulgaris and other Cucurbitaceæ Modecca palmata, Passiflora fœtida, Cardiospermum Helicacabum, Schmidelia Cobbè, Hibiscus Surattensis, Urena lobata, Abutilon Sp. Sida Sp. and other Malvaceæ, Triumfetta angulata and annua, Ammannia octandra and Indica, Zizyphus Ænoplia and Sp. Phyllanthus Niruri, Urinaria, Emblica, Croton lacciferum and Sp. Jatropha Curcas, Euphorbia Sp. Portulaca, Mulluga Sp. Toddalia aculeata, Impatiens Sp. Crotalaria Verrucosa, Laburnifolia and Sp. Indigofera Sp. Tephrosia purpurea and Sp. Desmodium triquetrum, Polycarpaea and Sp. Abrus precatorius, Flemingia strobilifera, Phaseolus Sp. Acacia Sp. Guilandina Bonduc, Cassia occidentalis, Tora and Sp. Bohmæria Alientata, Piper Sp. Cansiera Scandens, Aristolochia Indica, Amaranthaceæ, Menispermaceæ, Ipomæa Zeylanica and Sp. Mussænda frondosa, Hedyotis Sp. Ixora coccinea, Pavetta Indica, Elephantopus scaber, Vernonia zeylanica cinerea, Psiadia balsamica, Bidens Chinensis Ocimum Sp. Leucas zeylanica, Indica, Stachytarpheta Indica, Lantana Sp. Barleria Prionitis, Justicia adhatoda, Gendarussa, Ecbolium, Betonica and Sp. Gratiola Sp. Datura Metel, Capsicum annuum, Minimum, Solanum Indicum, Nigrum, Jacquini Carisa Sp. Asclepias Curassavica, Calatropis gigantea, Hemidesmus Indicus, Zingiber Sp. Alpinia Cardamomum, Costus speciosus, Canna Indica, Gloriosa Superba, Tradescantia cristata, Axillaris, Dioscorea alata and Sp. Arum, Caladium, Sp. Pothos scandens, Cyperaceæ and Glumosæ, many Sp. Tragia Chamælea, Lycopodiæ and Filices many Sp.

On Trees, Loranthus many Sp. Epiphytal Orchideæ.

In Marshes and Ponds.

Pontederia Sp. Nymphæe Sp. Nelumbium speciosum, Justicia Sp. Hydrolea zeylanica, Exacum zeylanicum, Villarsia cristata and Sp. Convolvulus reptans, Eriocaulon Sp. Gratiola Sp. Torenia Sp. Diceros Sp. and others.

TABLE 2nd.

General features of the Flora of the Sea Coast near Colombo; elevation level of the Sea to 500 feet.

Ther. 80° to 86 Faht.

All the trees and plants of Table 1st, large topes of the Cocoa Palm add.

1. On the Sea Shore.

Argemone Mexicana, Heritiera littoralis, Convolvulus Pes Capræ,* Bignonia salina, Rhizophora can-

* This is the "goat's foot ipomea," which in the north-east monsoon months is covered with beautiful purple-red bells. Tennent, on his arrival at Colombo, found

delaria, Kandelia Rheedii, Bruguiera gymnorhiza, Calanehoe laeiniata, Dilivaria ilicifolia.

2. Marshes, Ponds, Meadows.

Burmannia disticha, Nepenthes Sp. Pontederia hastata, Xyris Indica, Cuscuta reflexa, Justicia repens Tenella, Ereeta, Lumnitzera racemosa, Drosera Burmanni, Utrieularia vulgaris, Cærulea, Menyanthes Indica, Nymphæa stellata, pubeseens, Peda lium murex, Pancratium zeylanicum, Serpieula vertieillata, Tyha latifolia, Lemna minor, Pistia stratiotes, Potamogeton lateralis.

3. Tree like Plants.

Cassia auriculata, Sumatrana, Glauca, Melastoma Malabathriea, Sesbania aeuleata, Flaeourtia inermis, Calophyllum Calaba, Sehleiehera trijuga, Barringtonia speciosa, Acutangula, Raeemosa, Melia Azederaeh, Limonia citrifolia, Feronia Elephantum, Ægle marmelos, Strychnos nuxvomica, Guatteria suberosa, Korinti, Grewia orientalis, Hippoeratea India, Dalbergia arborea, Aeacia odoratissima, Cæsalpinia Mimusoides, Ardisia solanacea, Mimusops Elengi, Kauki, Bsssi longifolia, Spathodea longiflora, Uvaria Narum, Eugenia parviflora, Averrhoa Carambola, Bilimbi, Cinnamonum Zeylanicum, Aromatieum, Annona squamosa, Nauclea Sp. Randia Sp. Phœnix farinifera, Caryota urens, Elate sylvestris, Cerbera manghas, Iehnocarpus Sp.

3. Shrubs and Plants.

Vinca rosea, Osbeekia aspera, Cissus villosa' Vitis latifolia, Repanda, Quadrangularis, Alysiearpus Sp. Nerium zeylanicum, Carissa spinarum, Olax zeylaniea, Capparis horrida, Hibiscus cannabinus, Viti-folius, Phyllanthus rhamnoides, Multiflorus, Flemingia lineata, Glyeine labialis, Parviflora, Dicerma pulehellum, Adananthera pavonina, Connarus monoearpus, Pinnatus, Rourea santaloides, Ixora latifolia, Parviflora, Ionidum enneaspermum, Bengonia tenera, Hugonia mystax, Indigofera viseosa, Enneaphylla, Aspalathoides, Canthium Rheedii, Gmelina asiatiea, Heliotropium Indicum, Clerodendron phlomoides, Inerme, Premna Sp. Solanum insanum, Ferox, Sodomeum, Epaltes divarieata, Eclipta ereeta, Gynura lyeopersieifolia, Loranthus lonieeroides, Trichosanthes cueumerina, Bryonia, grandis, Momordica charantia, Antidesma Sp. Phaseolus earacalla, Trilobus, Sadiatus, Celastrus emarginatus, Abelmosehus fieulneus, Moschatus, Melastoma repens, Bumelia oetandra, Embryopteris glutinifera, Evolvulus Sp. Seævola Taeeada, Kœnigii, Sesamum Indicum, Ruellia Sp. temodia camphorata, Buehnera Sp. Hoya Sp.

TABLE 3rd.

Flora of the lower tracts of country surrounding Kandy 50 to 70 miles from the Coast, Elevation 1000 to 2000 feet.

Ther. 70° to 80° Faht.

All the trees and plants of Table 1st. The Cocoa Palm gives place to the Tallipot, Palmyra, and Areca Palms—add:

1st Tree like Plants.

Michelia Champaca, Uvaria odorata, Annona reticulata, Lcea staphylea, Cupania eaneseens, Grewia, lævigata, Mieroeos Sp. Melia parviflora, Atalantia monophylla, Murraya exotiea, Bergera Kœnigii, Aleurites moluecanus, Hiptage madablota, Gomphia angustifolia, Sesbania Ægyptiaea, Agati grandiflora, Erythrina pieta, Pongamia Sp. Dalbergia Anstrutheri (Mr. Ondaatje) Cassia Florida, Roxburghii, Bauhinia racemosa. Fieus politoria, Trophis aspera, Spinosa, Hydnoearpus inebrians, Mesua ferrea, Lagerstrœmia Reginæ, Stilago diandra, Clerodendron maerophyllum, Helicteres Isora, Alangium hexapetalum, Eugenia laurina, Gareinia zeylanica, Elæodendron glaueum, Dodonæa Burmanniana, Diospyros Ebenaster, Cordifolia, Flaeourtia sepiaria and Sp. Semeearpus Anaeardium, Cinnamomum Cassia, Antidesma sylvestris, Willd. Clauseneæ 2 Sp. Amyris agallocha.

2nd Shrubs and Plants.

Paratropia venulosa, Hedera terebinthiaeea, Cissus dentata, Osbeekia crenata, (Moon) Loranthus Buddleioides, Longiflorus, Goodenciflorus, euneatus, Æeh mandra rostrata, Bryonia laeiniosa, Gymnopetalum Ceylanicum, Momordiea dioiea, Passiflora Lesehenaultii, Naravelia zeylaniea, Ribes serratum (Moon) Capparis Grandis, Hibiseus furcatus, Abutilon periplocifolium, Gossipium album, Euphorbia tirucalli, & Sp. Rubus rugosus, Lasioearpus, Vernonia anthelmintica. Indigofera atropurpurea, Æschynomene aspera, Smithia sensitiva, Desmodium congestum, Psophocarpus tetragonolobus, Canavalia virosa, Mueuna prurita, Galactia tenuiflora, Notonia Wightii, Crotalaria Brownei, Hirsuta, Mimosa rubicaulis, Cæsalpinia sepiaria, Cassia Kleinii, Bryophyllum calyeinum, Polygonum Sp. Convolvulus grandiflorus, Speeiosus, Randia dumetornm, Hydrophylax maritima, Styleeoryne, Webera, Phyllantbus myrtifolius, Chrysanthemum Indieum, Siegesbeckia Orientalis, Pluehea tomentosa, Sphæranthus hirtus, Anisomeles Malabaricus, Caladium Nymphæifolium, Jussiæa villosa and Sp. Triehodesma zeylaniea, Cynoglossum ovatum, Solanum pseudo Lycopersieum, Ceropegia acuminata and Sp. Gymnema tingens, Jasminum pubeseens, Hedyehium coronarium, Alpinia calearata, Phrynium eapitatum, Amomum eehinatum, Amaryllis, zeylanica, Polygala Sp. Canthium parviflorum, Thunbergia fragrans, Barleria longifolia, Eranthemum montanum, Utrieularia Sp. Morinda umbellata, Ixora stricta, (wh. fld.) Ophiorrhiza Munghos, Ophioxylum serpentinum, Grumilea subinteger, Alsine nervosum, Ultica several Sp. Musa Troglodytarum, Santalum album, Gardenia fragrans, Anthericnm tuberosum, Burmannia triflora, Dieeros aquaticus var, Ventilago maderaspatana, Acacia scandens.

(To be continued.)

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the Galle Face ablaze with the blossoms. It was properly cleared away from the esplanade, but poor Wm. Ferguson, when living, cultivated and protected this binding plant on the seashore sands opposite the Galle Face walk. To the disgrace of the Municipal authorities they are now allowing the plant to be exterminated and the sands left bare to the action of the waves. In our drives we constantly see men and boys not only tearing the plant up but rooting it out with their dagger-like knives. It is taken away as food for rabbits and goats.—ED. *T. A.*

MYSORE COFFEE PLANTERS' GRIEVANCES.—The agitation of the coffee planters in Mysore is at last likely to bear fruit. It will be remembered that the planters complained year after year that the working of the Breaeh of Contraet Act was very defective and involved them in much loss. The Mysore Durbar have now partially redressed this long-standing grievance. It has been laid down that all *maestries* who take advances from the eoffee planters and, in consideration of these, undertake to provide them with *coolies*, should register their names in the taluq cutchery and no one will be allowed to pursue the trade of a *maestrie* unless so registered. The effeet of this ruling will be that the planters will be saved from the trouble of instituting inquiries in eaeh case as to the antecedents of *maestries* who volunteered to provide coolies, and erring *maestries* can also be easily called to account in case of default.—*Cor., Madras Times*, July 3,

CEYLON TEA IN LEAD PACKETS—TEA AND THE HOME DUTY—AERATED TEA.

LONDON, June 20th.

The following letter, which appeared in the *Grocer* for last week, shows how little the retail traders who deal in your teas have done to make themselves acquainted with the terms and conditions of the Merchandise Marks Act. It seems impossible to believe that any man, knowing how readily the provisions of that act may be transgressed and of the liabilities he may himself incur, should fail to carefully read it and guard himself in accordance with what he may find in it. And yet this "country grocer" seems to have got hopelessly muddled over the reports of the recent Segama case, and never to have thought of examining the act itself to find a solution to his difficulty. Mr. Leake, as Secretary to the Association, has this week sent a letter to the above-mentioned paper which will doubtless resolve the doubts of its not very bright correspondent, and it will prove to that individual that, provided he can prove innocence as to all intentional deception, and *bona fide* belief on his own part as to the genuineness of the teas he sells, he will be held scatheless under the provisions of the act. The following is the text of the letter referred to:—

CEYLON TEA IN LEAD PACKETS.

SIR,—Like many other grocers, I have undertaken the sale of the above, packed and labelled with high-sounding titles by well-known London dealers. I am pestered with appeals to take up other brands of the same class. These teas are variously described as "pure Ceylon," "Ceylon blends," "guaranteed three-fourths pure Ceylon," "a blend of Ceylon and other choice growths," &c.

But some recent proceedings in the law courts, reported in your columns, have awakened in my mind and, as I happen to be aware, in the minds of many other retailers, apprehensions which may be exaggerated or perhaps entirely unfounded. Suppose the Ceylon Tea Planters' Association—always on the alert to protect their interests and to pounce on the unscrupulous, the fraudulent, the mendacious, or the unwary vendor of tea—should take me before the magistrate on a charge of selling tea bearing a false trade description, could I be called upon to prove that the incriminated packets contained pure Ceylon or that there was, at any rate, some Ceylon tea in them?

No doubt I should be able to get half a dozen experts to swear that my tea was "pure Ceylon," or "three-fourths Ceylon," or whatever the exigencies of my case demanded and it is equally without doubt that the Ceylon Tea Planters' Association would be able to produce an equal number of duly qualified judges prepared to swear that my packets did not contain a leaf or a particle of Ceylon tea. The wholesale dealer from whom I bought the tea might then be called, and he being a man of mysteries, would reply that he was not prepared to divulge trade secrets, &c.

The point to which I would direct your attention, and upon which I hope to elicit practical trade opinion, is thus:—Whether misdescripton—even if purchasers are not misled by it—as to quality and place of origin, without the assumption of the name or brand of any particular estate, is actionable and punishable?—I am, &c., A COUNTRY GROCER.

June 11th.

The leading men in the tea trade seem to think that there are at last some indications as to how the different tea-growing countries are likely to be affected by the late reduction by twopence of the tea duty. Few of us had thought it possible that these could be furnished within so short a time, but it is evident that—whether due to the reduction or not—there has been a manifest change in the relative position of the various teas within the last fortnight or so, and it may be that experts have been right in the conclusions they have drawn from it. If these are correct, the view taken by myself and many others, that the reduction would prove to be favourable to China rather than to Ceylon or Indian teas, was a wrong one. This is what Messrs. W. J. & H. Thompson have written recently on this topic:—

"The probable effect of the reduced duty on values has been much discussed. Judging from the active demand, coincident with the reduction, and the advance in prices, the result has been favourable to the best teas, *i.e.*, to India and Ceylon, not to China. This tends to confirm the opinion held by some who are in close touch with consumers, that the public may take advantage of reduced retail prices to buy better tea; which agrees with our observation, often recorded, that tea-drinkers are learning to appreciate the benefit of using good qualities."

We hardly think, however, that you would do wisely to rely too unreservedly on this expression of opinion, though it has the *imprimatur* of such high experts as Messrs. Thompson. So many circumstances may contribute towards a disturbance for a time of the balance of the tea trade, that it is rather optimist perhaps to found a decision without awaiting the result to a more lengthened experience than has as yet been available since the duty was reduced. The mere fact of that reduction alone can hardly be held to account for the late boom in Ceylon teas, which have gone up fully twopence the pound during the last fortnight or three weeks.

My last letter made reference to the new drink prepared from your staple production and which we hear is called Aerated Tea, and not Sparkling Tea as previously mentioned by me. During the week opportunity occurred for me to taste this new drink, and my verdict upon it is decidedly very favourable. It opened as briskly as any champagne could do, and presented in the glass the appearance of the finest and clearest Alton ale—the aroma of the tea was quite perceptible to the nose, and equally apparent to the palate on drinking, It had something of the flavour of a raspberry sherbet, but without the cloying taste that beverage possesses. An old Etonian told me that, were his cricketing days to come over again, he could desire no more refreshing drink, it being in his opinion quite as staying, and infinitely more palatable, than the cold tea he always used to drink when playing. It is probable that it may be manufactured cheaply enough to warrant its being retailed at twopence the bottle; and should this be accomplished, we really believe it will run other temperance drinks very hard as a competitor in public favour and so conduce largely to the wider consumption of teas. We are assured that to obtain the delicacy of flavour so much appreciated by those who have as yet tasted the new drink it is necessary to use teas of the higher grades only. The commoner sorts would impart a roughness which would be much disliked. Mr. Wrightson, the patentee, gave me several particulars respecting his endeavours to produce this beverage which were of interest. He told me that former attempts made in the same direction have failed, as tea in solution is a very difficult article to guard against turbidity and requires most careful manipulation. He and the chemist who has been assisting him have been engaged on the required experiments for some years, and they believe they have now achieved complete success, and that the drink can be kept sweet and clear for almost an unlimited time. They are sending samples to the

principal doctors and analysts for report, and expect their full support, I am assured that "aerated tea" is made out of *pure tea*, no chemical essences or flavouring being used in its manufacture. By a novel process, an extract (which is also patented) is obtained, and from this—which will keep bright indefinitely by a preservative which is also a sweetener—the aerated liquor is finally prepared. It is entirely non-alcoholic. Mr. Wrightson further informed me that it is in contemplation to at once start a syndicate with a capital sufficient to thoroughly advertise the drink all over the country and then to sell to a larger company the patents obtained whenever it is thought desirable to acquire them. The patentees are now in treaty with certain moneyed parties, and have reserved the right to offer £1,000 of the capital to members of the Stanley-Wrightson Syndicate which manufactures the new tea chests. I think most certainly that the drink may become very popular, and that it is therefore likely to aid materially in the sale of tea both in this country and in those wherein cooling drinks are even more in demand than they are among ourselves.—*London Cor.*

JAVA COFFEE.

In view of the unfavourable accounts received recently concerning coffee production in Java a report on the subject to the Turkish Minister for Foreign Affairs at Constantinople by M. Werdmüller d'Elgg, a Dutch resident at Passeroean (Java), is of special interest. He deals with the production of coffee in Java during the last 30 years, and transmits with his report a note on the *Hemileia vastatrix*, the phylloxera of the coffee shrub, which has caused and is causing such great damage in tho Indies. The *Board of Trade Journal* says that, according to the documents furnished by M. d'Elgg, the average production, in piculs, of coffee in the 19 residencies of Java has been, for periods of five years, as follows:—893,400 piculs in 1859 63; 797,000 piculs in 1864-68; 831 000 piculs in 1869-73; 899,000 piculs in 1874-78; 988,000 piculs in 1879-83; 635,000 piculs in 1884-88.

It will be seen that production has been very irregular during this period of 30 years; but until the 1884-88 period it was to be attributed to the ravages of the *Hemileia vastatrix*, the presence of which has been officially noted in Ceylon since the year 1869, but which has only penetrated to the heart of the plantations of Java towards the year 1884. In fact the three residencies which have most suffered from the insect are those of Semarang, Cheribon and Madioen, which, having produced on an average during the 1864-68 period: the first 52,700 piculs; the second, 24,900 piculs; the third, 60,300 piculs; have produced during the 1884-88 period, no more than 27 300 piculs, 11,760 piculs, and 33,275 piculs, so that the average production of these three residencies has diminished by 50 per cent. for that of Cheribon, 53 per cent. for that of Madioen and 54 per cent forthat of Semarang.

M. d'Elgg adds thatit has been found from researches and experiments that in Java, where coffee has been cultivated for 200 years, there is littled ground for supposing that the cause of the decadence of this culture and tho spread of the coffee disease lies in the soil or in the variations of temperature, but that it is simply due to the presence of the *Hemileia vastatrix*, a small insect borno by the wind, and which spreads quickly in every direction. A preventitive method for combating this enemy of the coffee shrub need not be despaired of, as people have tested the experiments of Doctor Burck, director of the Buitenzorg Botanical Garden, who has used with success different solutions, such as borax, chlorido of iron, tobacco juice, &c. meanwhile the struggle is going on, but the use of the different methods has increased the general expenses of the culture and maintenance of the coffee plant.—*L and C. Express.*

GEMS AND PRECIOUS STONES OF AMERICA.

We have received from the Scientific Publishing Company of New York, a copy of a truly magnificent work, the scope and value of which are truly described in the accompanying letter, thus:—

"We take especial pleasure in announcing the publication of 'Gems and Precious Stones of North America,' by George F. Kunz. This book is pre-eminently the standard work of its kind and is indeed the only one which treats of the subject in a detailed and thorough manner. It is a systematic and at the same time a poplaar description of the several species and varieties of precious stones and pearls; their occurrence, value history and archæology. For the collector of precious stones and minerals it is especially valuable, the illustrations being all drawn from the finest known examples, and reference being made to the collections in which they may be seen. No work has ever appeared which furnishes to the archæologist and antiquarian so many references to the precious stones and pearls which have played an important part in early history.

"This magnificent work is profusely illustrated with the finest colored plates ever prepared for a book of this kind. The publishers have spared no expense to make this in every respect the finest example of American art."

Neither the value of the letterpress nor the exquisite beauty of the coloured illustrations is in the slightest degree exaggerated by the publishers, who have, with the author, reason to be proud of the addition they have made to the literature of America in general and of the science of mineralogy in particular. We hope, ere long, to have the pleasure of giving a more extended notice of this unique work.

ESTATE AND PLANTING NEWS.

The new Adjutant-General, Sir Redvers Buller, has severed his connection with Ceylon, having sold the estate Agrakande, so long managed by his late brother, to Lord Chelmsford, who, we are glad to see, is steadily extending his plantation interests in this Colony. Agrakande is a very desirable compact Dimbula property of 300 acres of which 257 are cultivated:—122 in tea, 110 in tea and coffee, 25 acres in coffee alone and with cinchona scattered over the place. The price paid has not transpired.

The experimental cotton plantation in the Matale district is named Florida and has 123 acres cultivated with cotton, out of a total of 152. The result of this experiment will be looked forward to with much interest as guiding future investments in plantations of cotton. If only the rich tank-irrigated lands farther North were made more accessible—by a railway—there can be no doubt that a large area would be put under this product.

THE CEYLON TEA PLANTATIONS COMPANY, LIMITED.

The following extract from the Prospectus published in connection with the call for preference shares is of general interest:—

The Ceylon Tea Plantations Company, Limited, was incorporated in December, 1886, and, for each of the three years since its formation, has declared dividends amounting to fifteen per cent per annum. The Company, the Ordinary Shares in which are held by comparatively few shareholders, has decided to increase its Capital by offering Preference Shares to the Public, and so provide funds for the cost and development of Estates recently acquired, and also to place it in a position to take advantage of favourable offers which from time to timo may present themselves for pur-

chasing other properties. From the Chairman's long and close connection with Ceylon, and from the intimate knowledge of the planting districts possessed by the Managing Director and the Ceylon Staff, the Company has had exceptional opportunities of selecting and securing some of the best Tea Estates in the Island, and the Directors believe that these properties will materially strengthen the Company's position. The Estates are all Freehold, and the following is a Schedule giving the acreages, districts, and elevations. Those maked thus * are the more recent acquisitions. (Then follows a list of 14 estates aggregating :—

Tea in bearing Dec. 1889.	Tea not in bearing.	Approximate acreage to be planted with Tea in 1890.	Coffee.	Jungle, Patena, Waste, &c.	Total Acreage.
acres.	acres.	acres.	acres.	acres.	acres.
3,815	1,098	392	127	2,328	7,760

The small acreage under *Coffee*, at the present value of the product, yields satisfactory returns, and in addition to the area planted with Tea and Coffee, there are many thousands of *Cinchona* trees on the properties, which are also expected to prove a source of revenue, as practically no further expenditure is necessary for their cultivation.

The Company is doing a large and remunerative business in manufacturing Tea for other proprietors, and also as agents, making advances against crops, and in carrying on a commission business in all matters relating to Tea Estates.

The net profits earned last year were £23,370 14 8, and, it is expected, with the additional area under Tea, the profits for the current year, on a carefully prepared estimate will amount to £29,000. This would leave fully EIGHTEEN per cent available for dividend on the Ordinary Shares and for Reserve, after setting aside sufficient to pay interest on the Preference Shares now offered.

OUR INTERVIEWS.

THE BUDGET AND THE TEA TRADE.

A TALK WITH A TEA EXPERT.

Whether Mr. Goschen foresaw the extensive development of the tea trade which would follow when he made his Budget proposal to reduce the tea duty by 2d per pound, is open to question ; but the fact remains that there has been a very substantial increase in the deliveries, for on comparing the months of April and May (that is the month before and the month after the introduction of the reduced duty) with the same months of last year we find the important increase of more than five million pounds. In fact, the result of the reduction of the duty justifies the contention of the free traders that increased trade follows removal of duty, although no doubt something is also due to the growing popularity of "the cup that cheers," and the increased, sobriety and temperance of the people. The increase which during recent years has taken place in the production of tea has entirely revolutionised the tea trade, for the total supply of this country, which not long since was derived from China and Japan, is now principally drawn from India and Ceylon. The greater portion of the China crop has been gradually diverted to other countries, in many of which, even at the present time, it continues to be more appreciated than the less known produce of India and Ceylon.

These facts were accentuated in an interview which the representative of *The Oracle* had a day or two ago with Mr. Wilson, a well-known tea broker, and a member of the firm of Gow, Wilson, and Stanton of Roodlane.

"Yes," commenced Mr. Wilson, "the deliveries for April and May were immensely heavy as compared with previous years, though it did not surprise me, as I know the way in which the trade has been growing. Some of the increase may be accounted for by the fact that a good deal was held over for the Budget, but even making allowance for that, the increase was very heavy."

"What will be the effect of the reduction of the duty?"

"It will benefit good classes of tea at the expense of the bad ones, by causing the demand to increase for the former, and decrease for the latter, hence it will help British grown tea, and the result will be that eventually China tea will be

SQUEEZED OUT OF THE MARKET.

Indian and Ceylon teas are much stronger than the Chinese article, so that it is really a battle between the weak and the strong, and we know which must go to the wall."

"What do you think is the position of the public in regard to the reduction of duty?"

"I think the public are buying better teas ; that is to say, they are paying the same price, but getting better tea for their money. The 2d. is really, at this moment, being divided between the planter and the consumer, but you must not forget that owing to the rise in the price of silver, the cost of production has gone up quite to the extent of 1d. in the pound of tea. I think the Silver Bill will have an effect on prices generally. The exact figure is 12½ per cent added to the cost of production by a rise of 2d. in the exchange value of the rupee. All produce which comes from the East will feel the results of the rise in the price of silver, and if it goes too far there are many tea gardens which will not pay to work. That will very likely make

A CRISIS IN THE TEA TRADE.

In all the principal tea-producing countries, labour, and everything else, is paid for in silver, and if the price of silver goes up, it will make everything dearer, machinery and all.* To show you the growing importance of the Indian tea trade, and the decay of the China trade, I will give you the figures for April and May in this year. In April the deliveries in China tea amounted to 4,685,000 lb. which increased in May to 11,510,000 or about double. In Indian tea, in April the deliveries were 5,155,000 lb. which increased in May to 14,492,000 or nearly three times the amount of last year ; while in Ceylon tea the deliveries rose from 1,334,000 lb. to 5,019,000, or nearly four times more."

THE ANNUAL RETURN.

"These figures complete the statistics for the season 1889-90, and show that India and Ceylon have expanded their deliveries—India having increased 16 million pounds within the last two years, and Ceylon having more than doubled in that period. On the other hand, the deliveries in China teas have fallen from 116,810,000 lb. in 1887-8 to 87,600,000 for the season just closed. The Foreign Office report, just issued, on the trade of Tamsui for the past year, says: 'The tea season of 1889 has been most unsatisfactory, both to foreign and native merchants. The teas of the island, which formerly had a distinctive character, are rapidly losing it, owing to the reckless competition amongst Chinese buyers for the Amoy market, and the careless preparation and fraudulent admixture by them of the teas after they have come into their hands from the growers. With the increasing competition from India Ceylon, and Java, in the opinion of those most competent to judge, the

DAYS OF THE CHINA TEA TRADE ARE NUMBERED,

unless steps are taken by the Chinese themselves in the direction of radical reform."

"Will the loss of the English trade affect China to any appreciable extent?"

"Oh, no! 100,000,000 lb. of tea is but a small drop in the ocean of what China could produce. Their own population consumes hundreds of millions of pounds. There is no necessity for China to send us tea at all." †

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* Most of the machinery is imported and paid for in rupees the full equivalent of its gold prices, so that we cannot follow Mr. Wilson here.—ED. *T. A.*

† Except in this way: that not being able to pay in tea for English goods, she will have to pay more in the shape of silk or some other product, or in money Or the Chinese will cease to consume much of English manufactures which they now use. In Canton, a city of over a million people, we saw very little of English goods in the shops.—ED. *T. A.*

"How is the tea arranged for?"

"It is done in this way. A middleman goes up the country early in the year, and arranges for so much tea to be sent down to a given port. This is brought down and prepared for the European market by being what is called "fired," that is, dried on a plate. This process fixes the active principle in the tea, and kills the fermentation which would otherwise take place, and allows it to be shipped and carried to its place of destination. It depends on the price got for the first crop as to whether it is thought worth while to bring down other crops."

THE BATTLE OF THE TEAS.

"Twenty-five years, ago," proceeded Mr. Wilson, "our supply of tea was drawn almost entirely from China and Japan, and British-grown tea was then struggling into existence, though the cultivation of the plant in India was just becoming known in the commercial world. The growing appreciation of Indian tea by the British public so steadily encouraged this new industry that the article gradually cheapened: tea was thus brought within reach of the masses of the population, and its consumption greatly increased. Indian tea was found to possess qualities which imparted such strength and character to the weaker liquoring China teas, that it was largely used for blending. China tea reached its highest point in 1879, when about 130,000,000 lb. was consumed in this country, but since that time it has rapidly decreased, while Indian and Ceylon teas have as rapidly grown. You can see quite clearly this fact in this diagram, which shows the rise and fall of the two classes of tea with black and red lines."

"Do you think the reduction of the duty will continue to benefit British grown tea?"

"Yes; we think it will do Indian and Ceylon teas good at the further expense of the China tea. Notwithstanding an advance in price, since April, of from 1d to 2d per pound in Indian and Ceylon tea, there has been no advance in the price of China tea, even when the Budget proposals became known. There was a strong feeling when the reduction was announced, that China tea being cheaper, there would be a run upon them, but the public evidently know when they

GET HOLD OF A GOOD THING,

and having tested Indian and Ceylon tea they do not care to go back to their old love."

"You think the public taste is now settled in favour of British grown tea?"

"Oh, yes, and a man who once gives his customers Indian tea cannot get them to return to China tea."

"Where do the greatest tea drinkers exist?"

"In Australia and New Zealand, where the annual average consumption in pounds per head is 7·66. In England it is only 4·70, while in Canada it is 3·69. No European country approaches that amount of tea drinking. But in spite of the increase in the use of tea the production has run ahead of consumption, and nothing but the speedy opening of new markets can check the downward course of prices. Russia in spite of her large consumption takes very little Indian or Ceylon tea, but confines herself almost entirely to China tea, and consumes large quantities of the very finest and most delicately flavoured descriptions. Indian teas have now been introduced all over America and Canada, and are doing well, and their teas are now making the same strides abroad as at home."

"Are there special advantages in the preparation of Indian tea?"

"Yes, it is a perfectly clean tea. It is prepared entirely by machinery, and is never touched by the coolies from the time it is picked to the time it is drunk. There is machinery for everything. The China tea is manipulated by hand entirely, with no European supervision at all. It is never seen until it comes to the ports for sale, and they can put any sort of leaf in, and pass it off for tea. At one time green tea was

FACED WITH STEEL FILINGS,

and we used to keep a magnet in the office to test it with."

"As to the future of the trade?"

"Well, he who deals with futures is generally wrong, but my opinion is, and I think I am right this time, that Indian and Ceylon tea will gradually abolish the Chinese article. Mr. A. G. Stanton, a member of our firm, has just returned from a visit to the United States and Canada, undertaken in a great measure to ascertain the present position of the trade in British-grown tea. He says it is surprising to see what rapid strides have been made there by these teas. The industry is taking firm root there, and he feels sure that before many years have passed, the United States and Canada will be markets of considerable dimensions. Ceylon tea, he says, has certainly hit the American public taste, and the development of the trade will no doubt give better average prices to the planters."—*The Oracle.*

PLANTING IN DELI.

Throughout Deli in May the weather proved highly favourable for planting, though heavy rain fell on several estates. Most of the planters profess themselves highly satisfied with the outlook. The growing crops bear a promising appearance. On some estates, where planting had begun early, the tobacco is already in the drying sheds. Holt's company this year shipped 118,000 bales of tobacco against 87,000 during the corresponding period of 1889. The Deli Company reports a career of prosperity in 1889 on the sixteen estates in its hands, and congratulates the shareholders on the success of the efforts to secure coolies direct from China, though at excessively high rates which are expected to fall ere long. The quality of those from Amoy leaves so much to desire, that the planters will not have any more from that port, but the Government sets so little store by this feeling as to choose that city as station for the Netherlands Consul in South China. The company has not yet been able to engage Tamil coolies, owing to the Government delaying in concluding an immigration convention with the Indian authorities. It has too, an eye for higher things than tobacco planting, and has co-operated in a movement to station among the free Battaks in the interior a Protestant missionary to counteract the Mohamedan propaganda now busy among them. A worker has already been chosen, and funds for three years' trial under under his supervision have been collected. The continuation of the work after that period depends upon results.

The Chinese coolie who murdered Dermont, the estate assistant in Assahan, has been sentenced to death by the Criminal Court there. The execution will take place at the scene of the crime.—*Straits Times*, June 25th.

THE WESTERN FRONTIERS OF CHINA AND THE RIVAL INDIAN AND CHINA TEA TRADES.

A lecture delivered last month before the Society of Arts, by Mr. D. C. Boulger, the historian of China, will be read with much attention by everybody who is interested in the relations between China on the one hand and the three great European powers that are now, as it were, knocking at her western and southern gates, that is, Great Britain, France, and Russia. Apart from the desire of Great Britain to see the expansion of Russia checked in Central Asia, the Thibetan question will be watched with great interest by Indian traders, and principally by the tea planters of Assam, who are at present debarred from competing with the Chinese monopolists of one of the best tea markets in the world. On this subject, however, Mr. Boulger does not touch. Writing over twenty years ago on this point, Mr. T. T. Cooper, in his wellknown 'Pioneer of Commerce,' said that, with an open trade route, the Assam teas would drive

the China brick tea from Thibet. Chinese exclusiveness and the desire to preserve their monopoly has shut out Indian teas up to the present, and we fear that, having regard to the great injury done to the China tea trade in the foreign markets by the teas of India and Ceylon, the planters of Assam and Darjeeling must be content with casting longing, lingering looks at the mountain barriers of Thibet, and must not hope for any immediate opening for their teas in that market. That Mr. Cooper's view is the correct one is shown by the recent annual report of the Imperial Customs of China, where it is pointed out that Indian teas have quite driven Chinese teas out of Turkestan, where they latter had a practical monopoly a few years since.—*Rangoon Gazette*, June 16th.

FAILURE OF COFFEE ROASTERS.

(Official Receiver's Department.)

RE J. AND C. COLLIER.

Accounts have been issued under this failure showing dabilities 37,078*l*., of which 9,380*l*. is unsecured, and assets 8,163*l*. The debtors, trading as "James Collier & Sons," coffee-roasters, &c., of the Commercial-street Steam Mills, also as "Walker and M'Letchie," manufacturers of liquid extract of coffee, at Great Pearl-street, joined their father in partnership in June, 1877, the capital of the firm amounting to 7,824*l*. The failure is attributed to losses by depreciation in the value of their business premises and plant, &c., to losses by consignments, to bad debts, and to heavy interest on mortgages. The "fully-secured" creditors' hold mortgages on the debtors' freehold premises, and those "partly-secured" hold dock warrants for cocoa and chicory and a second mortgage on the Commercial-street premises. The first meeting is fixed for the 24th instant.—*Daily News*, June 19th.

PLANTING IN NETHERLANDS INDIA.

(From the *Straits Times*, June 18th.)

The Planters' Association at Sukabumie in Java have petitioned the Governor-General to allow the army in Netherlands India, in future, to draw its supplies of tea from local producers. The Chinese tea in use among the soldiers turns out to be bad and of low quality. The planters call attention to the strangeness of the fact that, while Java produces excellent tea, the army purveyors give the preference to inferior Chinese kinds.

The indigo outturn in Java shows signs of being 20 to 25 per cent below the crop of 1889. The falling off is said to be due to degeneration in the plants under cultivation.

Mr. E. L. Gordon, the pioneer concessionary of the Western Borneo Goldfields, has been recently to Batavia after starting a mining company in London with a capital of £300,000. The Company has eight Europeans at work in Montrado, who have already prospected with promising results.

In East Borneo, by last advices, European enterprise has made further headway than is generally known, but want of labour works as a drawback and trammels success in prospecting the gold and diamond mines there. The Batavia *Nieuwsblad* states that both the Rajah of Pasir, and the Rajah of Cotie in East Borneo, have decided upon leasing waste land in their dominions on easy conditions but, unfortunately, delays of office which demand the consent of the Governor-General to each concession stand in the way of much advantage being taken of their liberality.

Mongooses have been imported from India into the province of Kedirie in Java, to clear away field rats and other vermin which destroy the crops there.

On the 1st May last, the blockading squadron on the coast of Acheen consisted of nineteen vessels.

COOLY LABOUR.

(*From a Planting Correspondent.*)

The question of cooly supply for the coffee districts is getting beyond a joke, and Planters cannot cope with it without assistance. Do what we can with our Planters' Associations, appeal as we will to Government, the deaf ear is always turned to us, and help in any shape or form denied us; and yet if Government would only look at it in the light of Rs. As. Ps., it would see that the coffee industry has more to do in filling the treasury in coffee districts than it seems to imagine, besides the benefit that other districts derive therefrom. How many coolies do the coffee districts in Southern India annually employ, how much money do those coolies take away yearly to spend in their country? Almost every head of a house now owns land, and how did they accumulate the money to pay for it, and the yearly tax? Why, only by working on coffee estates. The advance they get buys the land, and one or two of a household are left to attend to it and one or two come to work off that advance, and help to pay the tax. What are the imposts in grain, fruit, salt, coconuts, beetle leaf, cloths, glass, bangles, &c., &c., &c., in a place like Coorg whilst the district is in full swing? Let Government enquire of the Commissioner, and then judge whether or no coffee as an industry is a thing to be lightly passed over. Take an estate of 300 acres, which should have one cooly an acre by rights for its proper working, and given that each cooly spends R4 a month in the district itself, that gives R1,200 a month, or a given sum of say, in eight months, of R9,600 Then say that each cooly saves R2 a month, that gives—to be taken to their country or held pay off the advance given,—say R4,800. This is only on one estate, and the number of estates in Coorg include large acreages now, belonging both to Europeans and Natives, so that the annual amount spent for working alone is immense, besides the work given, during crop; to bandy contractors for the conveyance of crop to Mangalore, Tellicherry and Bangalore. In fact if Government would only choose to take a little trouble and go carefuly into things, it would be astonished at the figures, and the amount of money expended by coffee planters for the benefit of the country, exclusive of the very handsome amount paid into the Treasury on coffee assessment, income tax, bani tax, &c., &c. What was Coorg years ago before the country was opened out, and what is it now? This I will leave to Government reports. Yet now a crisis is coming, and it is either recovery or death, as the planter cannot fight on singly much longer, for the want of labour is telling most emphatically on most valuable property. The planters have no hold over maistries to whom money has been advanced has been shown over and over again; and planters as a body have again and again tried to get help from Government in such cases. The last endeavour was that all maistries should have a registered certificate from the parpiteyar, or subadar of their villages as to their being persons to be trusted to bring in labour. Not a very great request this, but we might as well appeal to the gods of the heathen, as to a Government which takes all it can get from its struggling offspring and gives nothing in return.

What is the use of planters struggling on against such odds? In bad years ryots get a deduction in tax money. Do we? No, our places may be going back from short crops and not sufficient labour to work them, but to ask for a reduction in tax would be the height of insult, and the reply would be equivalent to, "No, you are not natives, to them we grant every thing asked, to you not the stretching forth of a little little finger." Where is the use of planters spending money year after year in supplying their estates when it is too late? At the beginning of June everything should be ready for this all-important work, but now-a-days there is not a cooly in, they are quietly reposing in their country, daily attending to their fields, and eating the planters' advance whilst we are longing for them to come. Our work is all behind, our coffee is all in weeds, which are eating all the manure we have put in for the benefit of the

coffee; not a pit has been made for next year's supply, that should have the whole benefit of the short monsoon we have, and so another year is lost. Nothing can be done to the maistry for breaking his agreement by not coming in by the 15th of May, and so we are the losers year by year. And what is the consequence? Fields that could have been planted had labour been in have to be abandoned, for there is no use of thinking that it is borer that is decimating the estates; it is want of labour at the right time. Where is the use of supplying at all when it has to be done at the end of July, and after the middle of August, when the place, too, is as full of weeds as it can be, that only choke the supply before a weeding can be done; and how can pitting be done properly in weeds three feet high? Every work must be done in its order, and yet this is an impossibility now. If we do not get supplies up, there is no use continuing in coffee, and that we have a poor enough chance of getting them up is universally felt by all. Besides when the first and principal work is so far behind, all the other works suffer in consequence. Shade is, to a large extent, required and must also be planted out early, but this has to be given up generally (a work second to supplying). Then digging and all turning of the soil, should be done during the rainy season, and this has to be left till the end of the monsoon. And why is there all this loss of time, simply owing to the fact of the labour supply not being sufficient or rather no labour in at the first, and whose fault is it? Superintendents are blamed, but it is no more their fault than the man in the moon's. Cooly pay has been increased this year as an inducement, but the Mysore cooly is far too well off in his country (having fattened on his gains, from the coffee district) to trouble about coming in, and when the maistry, from whom he has taken advance, goes to his village to call him to go to the estate, he flatly refuses, knowing very well that he cannot be compelled, although he has signed an agreement to work from a stated time to a stated time, generally from eight months to a year on the estate. Coolies, before being paid off in March, are only too eager to take an advance; but let them go to their country, and it takes no end of persuasion to make them make up h mind to return. Can nothing be done to help th maistry, when in his country, to force the cooly to return or have him fined, there and then or imprisoned? What is the use of warrants being issued when the maistry must first go to the coffee district to a Magistrate there before he can get one for the cooly, and then the warrant never can find him, and the maistry is so far from him, he cannot go to look for him, as his work is on the estate, looking after what coolies he may have brought in with him. The evil that this men-catching by warrant is invoking is now widespread, as coolies are knowing enough now to elude any warrant sent, and so laugh at the whole proceeding. Now, I ask, is it just or fair that Government should let valuable properties suffer by not giving some small assistance to the planters, for in the end it will be the loser as well as the planter who has done his best, and yet lost money by spending it in this country in coffee when so heavily handicapped. Let there be a famine in the Mysore district, as there was some years ago (which God forbid) and we will have shoals of worthless people come to us for the sake of food, and Government will be glad that the people are provided for and off its hands, and that the planters who have been so in need of labour will now have their estates worked for them. What would Government not have given to have had some thousands of people provided for during the famine in Ganjam, and that we can employ thousands there is no doubt. Why should Government send cooly labour to foreign countries when it is so much needed nearer home? Coolies don't like to leave India, then why not arrange with us? We can employ them but must have as good arrangements made with us as is made for those who got labour sent them outside of India. There is an immense field here, for Mysore labour is failing us utterly, and to get labour from over-populated districts would be a boon to distressed coffee planters.—*M. Mail*, June 27th.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &c.,
Editor of *Science Gossip*.

PLANTS—GUM TREES—CORAL.

A German botanist, who has been for some time engaged upon the mathematical study of the contrivances for hindering the descent of parts of plants to the ground, and for favouring their aerial transit, sums them up as follows:—1, Dust-like (Schizomycetes, fungus, and fern spores, &c., and the pollen of wind-fertilised flowers); 2, fruits furnished with bladders (as in many of the orchids); 3, hair-like seeds; 4, disc-like and flat (like the fruits of the elm and some of the lilies); 5, parachute seeds (like the hosts produced by composite plants, and others in the Dipsaceous and Plumbaginaceous orders); 6, cylindrical and winged (like the fruits of many of the Polygonaceæ); 7, fruits with ridges giving a sail-like form (like those of Ailanthus): and 8, samaras, as the wellknown fruits as the ash, maple, &c., are called, whose structure enables the wind to carry them away with the screw-like motion. The remarkable thing is how so many plants which have not the slightest botanical relationships to each other have managed to hit upon the same identical devices—to take out the same patents, in short.

You do a good deal of "ringing" in your gum-tree forests in Australia. There is no sight which struck me more out there (with rather a melancholy impression) than the dead, standing forests of ring-barked gum-trees, looking so weird that Gustave Doré would have been delighted to have sketched them some moonlight night. They seemed to me like so many vegetable ghosts. I am reminded of my experience by reading some remarks made by a German professor of forestry on the subject. He goes in for "ringing" scientifically, and shows that the ringing of branches produces a more active growth above, and a less active growth beneath the ring. Starch is usually entirely absent from the portion below the ring, whilst oxalate of potash is usually most abundant there. Of course, the German foresters "ring" their trees to do them good, not to kill them so as to clear the land.

In a recent paper read before the Royal Society of Edinburgh, Dr. John Murray, of "Challenger" fame, discussed the question at the origin of coral reefs and other calcareous formations in recent seas. Calcareous remains are found in great abundance at the sea bottom in shallow waters, but the amount steadily diminishes as the depth increases, until at four thousand fathoms almost every trace has disappeared. Dr. Murray thinks this is due to solution as the organisms slowly fall to the bottom. Within five hundred fathoms of the surface the ocean everywhere teems with life. This is an important fact to record, as the ill-fated "Greely Expedition" actually starved within ten feet of abundant food, which might have been obtained by breaking a hole in the ice and using a shirt as a drag net. Dr. Murray is of opinion that the chief reason why there is such an extraordinary growth of coral in tropical regions is because carbonate of lime is continually produced in large quantity by the action of sulphate of lime in solution on effete products, and that the absence of coral reefs on certain shores is explained by the uprise of cold water due to winds blowing off shore. —*Australasian.*

COMPRESSED TEA.—The *Kew Bulletin* for June contains an account of the manufacture of compressed tea at Hankow. This tea is in use throughout Russian Siberia, and is made of tea dust compressed by steam power, and differs from the brick tea of Tibet, which is made of the entire leaves pressed together. The Timber trees of the Straits Settlements are next passed in review, the notice being founded on the collections of the late Dr. Maingay. The remainder of the part is taken up with correspondence, showing the desirability of extending the cultivation of Cotton in West African colonies.—*Gardeners' Chronicle.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, June 19th.

Cinchona.- The fortnightly auctions were held on Tuesday, and oonsisted of a moderate assortment, the catalogues comprising the following quantities :—

	Packages		Packages	
Ceylon bark	1,455	of which	1,172	were sold
East Indian bark	524	do	435	do
Java bark	46	do	45	do
South American bark (Calisaya)	370	do	132	do
Total	2,395	do	1,784	do

A fairly satisfactory tone prev iled throughout the auctions, and occasionally competitions become rather brisk, a great many lots being divided among two or more buyers, one firm cutting in as soon as another attempted to drop the price. The prices realised were rather irregular, but the average unit is placed just a trifle above that of the last Amsterdam sales, say at 1½d to 1⅝d per lb. for fairly good b rk. The Ceylon barks offered did not inolude anything of particular interest, although there were several parcels of good Officinalis bark among the supply. From India there was a fair assortment, and several parcels of renewed red shavings and chips sold at unusually high rates. The South American barks consisted exclusively of Bolivian Calisaya quills, whioh are gradually becoming a feature of some importance at our auctions. It may be mentioned that the supply of root bark at the sales was comparatively heavy, the total weight of this description of bark being nearly 50,000 lb.—mostly Succirubra from Ceylon.

The following are the approximate quantities purchased by the principal buyers :—

	Lb.
Agents for the French, Italian, and American works	110,588
Agents for the Mannheim and Amsterdam works	106,089
Agents for the Brunswick works ...	65,693
Messrs Howards & Sons ...	56,373
Agents for the Auerbach works ...	45,445
Agents for the Frankfort o/M and Stuttgart works	23,651
Mr. Thomas Whiffen	18,485
Sundry druggists, &c...	37,245
Total quantity sold	463,569
Bought in or withdrawn	117,416
Total weight of bark offered ...	580,935

It should be well understood that the merc weight of bark purchased affords no guide whatever to the quinine yield represented by it, firms who by a sm ll quantity of bark by weight frequently taking the richest lots and *vice versa*. An analysis of the catalogues gives the following prices for sound bark:—

Quinine.—Lower. At the beginning of the week no business was reported, but yesterday and today about 40,000 or 50,000 ounces; B. & S. and Brunswick have been sold by second-hand holders on the spot at 1s 1½d per oz.; that is the market quotation today.

TEA SCALE-INSECT.

Mr. E. C. Cotes wrote regarding the tea scale insects received from Kangra, that Mr. Atkinson identified them as of the family *Coccidæ* and Genus *Ceroplaster*, probably a new species, and that they had been sent to Mr. Maskell for examination and descriptions, if new. Mr. Cotes also asked for further specimens, especially those showing the different stages.

Mr. W. H. Miles sent the following note on the Tea Scale-insect which has been recently observed in the Kangra Valley. As coogenerous pests which have attackod the Orange and Coffee have doue such serious damage, members observing this new enemy to tea are requested to commuuicate with the Society on tho subject, and to collect specimens of the insect in all its stages so that it may be identified, and more of its life history known:—

Since 1868 wheu they first began to attract attontion,* the family of Scale-insects have made themselves notorious as one of the most dreaded and destructive of a'l the known enemies of plant life. First noticed in Australia, they travolled on to Cape Colony, and finally appeared iu California, and as soon as they had established themselves in a new district proceeded to spread in all directions. In Cape Colony aud California the principal sufferer was the Orange tree, and so great was the damage done, that many owners of Orange groves were ruined. In Ceylon, the Scale-insect has done immense damage to the coffee-plant, and many plantations have heen closed in consequence.

In order to mark its coming of age, so to speak, it has turned its attention to tea, aud already is has done no inconsiderable amount of damage to the bushes. It first appeared on two gardens in the Kangra Valley in the early part of this year (1889) and has since heen reported from Assam, but there is nothiug to show the manner of its introduction in either district. There is reference in Part 1, Vol. 1. Indian Insect Pests, to a new coccid found on Cinchona in Sikkim which matures about April, and as the Scale-Insect was first observed on tea about that time, there may be some connection hetween the two

There is little to describe about the actual insect, as it has not yet heen observed in a free state. When a plant is attacked it soon becomes covered with little hrown scales about one eighth of an inch in diameter, which adhere closely to the stem of the plant, but can be easily removed by inserting the blade of a penkoife under them. Under the microscope these appear to he cases only, as there is no structure apparent, and in several I have detected a small puncture through which I imagine the imago escaped. The insect appears to he most active in bright weather and almost disappears in the rains. Some specimens forwarded to me in November last were of quite a different character to those described above, the scale being soft and pulpy and covered no the outside hy a thick coating of soft white waxy-looking substance. This may prove to he the female.

Its effect on the tea-plant is somewhat similar to that caused hy the tea-bug, but more marked, as the Scale-insect appears to absorh the juices of the plant through the stem, and the bush immediately begins to sicken, aud would soon die down unless prompt measures were taken.

The most effective remedy is the kerosine emulsion which has been used with very good results in the United States and Ceylon, against the forms of Scale-insect attacking the Orange tree in the former and Coffee in the latter country.

The formulæ for preparing the Kerosine emulsion recommended by the U. S. Department of Agriculture, were reproduced in Vol. VII, Parts II and III of the Society's Journal.

I have already discovered a parasite of the Scale-insect which closely resembles Coccophagus californicus, figured in the Periodical Bulletin of the U. S. Department of Agriculture, division of Entomology, for March 1889. Though it may take some time for it to develope properly in order to he an effective enemy of the Scale insect, it is satisfactory to know that it is in existence.

This short note is merely intended to draw atteution to a subject which may occupy a prominent position in the near future. Though not wishing to appear as an alarmist, I fear that tea is threateoed with a new danger, which may do more harm than any of its predecessors, judging by what has happeued in other parts of the world. I would seriously impress on all connected with this great iudustry, more especially managers of gardens, to he on the alert, and at the first indication of this pest, to adopt remedial measures at once to stamp it out, otherwise there is no telling what the consequences may he.—*Proceedings of the Agricultural Society of India.*

* The ravages of black or brown bug on Coffee wero noticed in Ceylon nearly thirty years ealier than 1868, and wore the subject of an elaborato report in 847 by the government botanist, Dr. Gardner.—Ed. *T. A*

Cotton.—In the Northern and Western parts of Mysore a species of cotton plant grows known to tho natives as the *depathi mara* or candle plant. The seed pod is about two to three inches in length and divides in three sections when ripe, each section containing a cluster of seed closely patched with cotton wool. If the narrow end of the section be lighted, it will keep a flame for about ten minutes, the seeds giving off a large quantity of oil. The cotton is of no use for spinning, the yield from each pod being extremely small.—*Indian Agriculturist.*

THE RISE IN CEYLON TEA EXPORTS.—Very strikling is it to see in printing off a table of Staple Exports of Ceylon for 53 years from 1837 to 1889 inclusive, for our Hanbdock, that *Tea*—now the greatest of all—is first entered in 1873 for 23 lb. exported, and this has developed in 17 years into 34,346,432 lb. valued by the Customs at £1,786,014 in 1889!

CINCHONA BARK FROM FIJI AND THE WEST COAST OF AFRICA was offered at a recent London sale; and Messrs. Brooks & Green report on the same:—113 packages from West Africa, weighing about 6 tons, were included in the auctions 22nd April: the quantity was rather above the recent parcels and sold from 4½d to 6d a lb. 6 bales Fiji bark, quality poor, 4 bales sold at 2d a lb.; 2 bales at 3d a lb.

GRASS CROPS AS AFFECTED BY MANURE.—Good feeding grass and shelter are the main desiderata in stock rearing in Ceylon, and it is interesting to find Sir James Caird in a review of British agriculture stating that the experiments of Sir John Bennet Lawes had shown that the natural produce of grass may be doubled and even trebled by the continuous use of special manures. Trials in this direction and in that of growing superior pasturage by irrigation are needed in Ceylon.

CREOSOTED TIMBER.—We occasionally receive complaints from gardeners and their employers concerning the injury done to plants when creosoted timber is employed in the construction of plant-houses, and the impossibility of minimising the injury by any known means. Mr. Archibald Mackie, gardner, Rosehaugh, Avoch, Ross-shire, writes, that his structures, consisting of Orchid and Melon-houses, vineries, ferneries, are constructed with creosoted timber. which causes no injury to the plants contained in them, although the creosote oozes through the paint, and is very perceptible to the sense of smell. We should be glad to have the experience of gardeners and others who have had charge of plants in houses built of timber similarly treated.—*Gardeners' Chronicle*.

QUININE.—It is a curious fact-says the *H. & C. Mail*—that while the annual supply of quinine for the whole world is estimaled at about 6,000,000* oz., more than 3,000,000 oz.—one-half of the entire quantity—are cousumed in the United States. Owing partly to over-production, partly to the substitution of other drugs for quinine, the price of the article bas fallen so much of late years that large plantations of the cinchona tree have been uprooted in Ceylon, and the tea plant cultivated in its place. The exports of the bark from Ceylon, in which islaud the cinchona is extensively grown, declined more than one third between 1885 and 1887.

THE GRIEVANCES OF MYSORE COFFEE PLANTERS.—Ever sinoc the rendition, the European coffee planters of Mysore have been complaining of the remiss manner in which the Breach of Contract Act is being worked in the Mysore Province. Those who know how much capital has been sunk by them in opening coffee plantations wish that every help should be given to them, so that tho resources of the country may be developed as much as possible. The Mysore Government has not however, till now, paid any heed to their gricvances. The fact that *mai-tries* take large advances from the planters undertaking to supply them with coolies and then deceive them, is well known, and the sooner therefore some more efficacious and speedy remedy is found the better. The Breach of Contract Act is too antiquated and it requires revision so that it may be adapted to the present changed circumstances.—*Cor., Madras Times.*

* Our estimate of the world's consumption is nearer 8 million ounces—ED. *T. A.*

TWO LARGE CONSIGNMENTS of Canadian seed grains—wheat, barley, oats etc.—have just arrived in India for experimental cultivation, and the experiments will be made in the North-West and the Punjab.—*Indian Agriculturist.*

MYSORE, July 3rd.—Crops will be short this coming season in Mysore, and the same is reported from Coorg. We had a heavy downpour latter end of December which kept the trees green all through the hot weather, and the blossom showers were unusually early this March, which prevented the bud-bearing wood to winter, and April turning out a heavy rainfall, the blossom that came out did not set as satisfactorily as was looked for.

PLANTING IN NORTH BORNEO.—The report of the Directors of the North Borneo Co. just out when the mail left, has the following paragraph:—

The Directors are glad to report that the progress which set in last year in consequence of the attention given to tobacco planting shows every prospect of continuance, as evidenced by the large sales of land and the marked improvement that has taken place in almost every item of revenue. Attention is also being given to the cultivation of other products: the suitability of the company's territory to the growth of Liberian coffee has been successfully demonstrated in Marudu Bay. Altogether the prospects of the country are encouraging.

CALIFORNIA CORRESPONDENTS, says *Gardens and Forest*, speak of the great success which has attended the "colony system" recently introduced in the southern part of the State. Tracts of land are laid out in small holdings and apportioned among a body of immigrants, who, upon their arrival, find everything ready for work. A body of colonists from Holland who arrived not long ago at Merced, found houses build and gardens and orchards arranged, more than two thousand acres having been planted with fruit-trees and vines; and fifteen English families were established a few weeks ago at Bakersfield, in Kern County, each receiving a forty-acre holding similarly prepared.

ARRIVAL OF PEPPER FROM EDIE.—The steamer "Hok Canton," which arrived from Edie on Saturday, and the steamer "Washi," which came in the following day, both brought shipments of pepper from that port. We understand that these consignments having been contracted for last year, were allowed to be exported without extra duty being charged, and that there are still some 13,000 bags of such pepper to come here. Pepper contracted for this year will not be allowed to be shipped until the hostilities against the Achinese in Edie are brought to a close, when an extra duty will be levied on it to recover expenses incurred by the Dutch in consequence of the recent fighting.—*Pinang Gazette*, June 24th.

AN IMPORTANT MEXICAN SCHEME.—We (London *Times*) understand that a new undertaking on a large soale has been formed on the principle of a trust company, wbose sphere of operations will be in South America and Mexico, the prssent time being considered favourable for occupying the ground in that quarter. The capital will be £3,000,000 in £10 shares, of which 200 are founders' shares. Apart from the investment of its funds, the Company will undertake the acquisition of concessions and other business connected with the above mentioned countries. The directors, we are informed, believe that a satisfactory profit will also be made by co-operating in public issues, and for that purpose the Company will work in close alliance with the Trustees, Executors, and Insurance Corporation, Limited, and with Messrs. C. de Murrieta & Co. Two of the members of Messrs. Murrieta's firm will it is stated, be on the board.—*Public Opinion*, June 13th.

CEYLON TEA IN AMERICA.

We now call attention to the full report of yesterday's meeting (page 122.) There can be no doubt that the Company is fortunate in getting Mr. Grinlinton to represent them in New York; for besides his well-known business capacity, he has a direct personal interest in the fortunes of Ceylon tea and will, we feel sure, do nothing to risk its good name. It was mentioned at the meeting that if the negotiation with Messrs. Wattson & Farr fell through, the Company must cease operations through its capital running short. Now this was a blunder—and worse, in a small way,—a crime! How is the Ceylon Agent to hold his own in New York, if this is the intelligence given to the other side? The fact is that the further capital has not been forthcoming, because the interest which yesterday's meeting and much more Mr. Grinlinton's trip Westward, will arouse, was wanting. Let our Agent only report back that the promoters of the new Company refuse to bind themselves *to sell none but pure Ceylon tea*, through their "Ceylon Planters' Company," and at the same time demonstrate that there is a profitable business to be done,—and we may be sure the further capital required would be forthcoming. In fact, we should then vote for closing the Tea Fund—and devoting that self-imposed tax and all spare capital to the Ceylon American Tea Company. Let our New York friends therefore make their mind easy as to our Company being handicapped, and our agent in a corner. He goes with a free hand and will, we feel sure, not commit his brother tea planters to any conditions not fully to be commended on mature consideration.

CEYLON AT THE NEW ZEALAND EXHIBITION.

Dunedin, June 7th.

A. Philip, Esq., Secretary Planters' Association, Kandy.

Dear Sir,—Since writing to you on 30th April (copy of letter herewith) I have received your favour of 1st May. In reply I am sorry that the case shipped by Mr. Geo. D. Jamieson did not reach me, and I can find no trace of it.*

Award Certificates.—By this mail I send to Mr. Carlyon parcels receipt for a box addressed to you and covering a tin lined case, containing the whole of the Award Certificates as per list enclosed herewith.†

I have asked Mr. Carlyon to clear the box and forward it to you.

Accounts.—Enclosed please find a statement of receipts and disbursements by me on account of your Court. I send you herewith Draft on London for £37 10s, the balance being not yet fully collected. There are still some photographs in frames and a few other small things to dispose of for which I trust to send you a remittance shortly. Valuing the kiosk in my hands at £50 it will be seen that after all disbursements here, and including the passages of the native servants to Ceylon, the net outlay defrayed by you for disbursement in this colony will be under £90, which I trust your Committee will consider satisfactory.

Kalutara Carved Work.—I regret to state that four sets of articles forwarded by Mr. G. M. Fowler, c.c.s., on account of Sinno Wadu Arachchi and invoiced at R145, are unsaleable here at a quarter of the equivalent of that sum. One carved coconut shell invoiced at R25 I sold for £1; the rest are retained pending instructions.—I am, dear sir, yours faithfully,

(Signed) W. Watson.

Cinchona Bark.

F. G. A. Lane, Blair Athol, Ceylon		First award
W. Jordan & Co., Ceylon		do
Cocoa.		
North Matale Estate	...	First award
Gangarowa	...	Second award
Charles Mackwood	...	Third award
Arrowroot.		
R. P. Jayawardene	...	Second award
Kalutara Workmanship.		
G. M. Fowler	...	First award
Kandy Art Work.		
	...	Second award
Cane Furniture.		
T. J. Ramlan	...	Commended.

Signed W. Watson.

Statements of Receipts and Disbursements by W. Watson on account of the Planters' Association Kandy, at the Dunedin and South Seas Exhibition, 1889-90.

Receipts.

		£	s.	d.
Received	from Secretary, P. A., Kandy ...	150	0	0
Do	for cups of tea, &c., sold in kiosk ..	466	19	2
Do	for duty refunded by N. Z. Government	14	8	6
Do	for sales of tea and coffee exhibits ...	45	19	6
Do	for sales of tea for consumption unused	25	17	0
Do	for sales of kiosk furniture, &c. ...	22	8	3
Do	for sales of ebony, elephants, &c. ...	8	5	0
		£733	17	5

Disbursements.

	£	s.	d.
Cost of kiosk	50	0	0
Do of exhibition space	20	0	0
Do of erecting and flooring kiosk... ...	50	10	0
Do of furniture, linoleum, gas fittings, crockery, &c.	94	7	2
Do of advertisements	26	7	6
Do of photograph frames	7	4	3
Sundry payment for sugar, milk, biscuits, freights, gas duties, washing, dinners to servants, extra service, &c., &c., &c... ...	173	5	0
Mr. K. S. Begg's salary	78	0	0
Wages to Jayanhami	39	14	2
Do to W. Fernando	42	3	9
Do to. J Roderigo	40	8	4
Native servants' expenses in Dunedin ...	46	5	6
Do passages to Melbourne (reduced)	7	10	0
Remittances to H. Mackenzie, Melbourne ...	13	1	11
Remittance to Secretary, P. A., Kandy ...	37	10	0
Balance	7	9	10
	£733	17	5

(Signed) W. Watson.

Dunedin, June 7th, 1890.

June 7th.

T. J. Parker, Esq., b. s. c., Dunedin.

Dear Sir,—As representative of the Planters' Association of Ceylon at the Dunedin and South Seas Exhibition of 1889-90 I have the pleasure to hand you for the benefit of the Dunedin Museum twenty four specimens of Ceylon Birds and a box of Ceylon Butterflies.—I am, &c., (Signed) W. Watson,

Inspector Colonial Bank of New Zealand.

List with names of birds enclosed.

Quinine-Works for Sale.—As will be seen from an announcement in our advertising columns, another quinine-factory is about to be offered for sale by public auction. This time it is M. L. Viennot who desires to dispose of his factory at Ivry-Port, near Paris, where he has carried on for many years the manufacture of cinchona derivatives and other medicinal alkaloids.—*Chemist and Druggist.*

* We omit the correspondence between Mr. Jamieson, Mr. Philip and the Wharf and Warehouse Co., on this subject: it is very unfortunate that a special assortment of fine teas from Mariawatte failed to reach Dunedin—appropriated in Melbourne doubtless?—Ed. *T. A.*

† This list is identical with that which we published on March 26th (page 311 *Overland Observer*) save for the closing awards in cinchona, &c., which we reproduce now.—Ed. *T. A.*

SPECIAL MEETING OF THE CEYLON PLANTERS' AMERICAN TEA COMPANY, LIMITED.

PROPOSALS FROM AMERICA FOR THE RE-ORGANIZATION OF THE COMPANY.

In accordance with due notice a special general meeting of shareholders in the Ceylon Planters' American Tea Company, Limited, was held at the offices of the Company in Queen St. yesterday, commencing about 1 o'clock. Mr. L. H. Kelly (Chairman of the Company) presided, and the other directors present were Messrs. G. A. Talbot, Harry Whitham, C. Spearman Armstrong, W. W. Mitchell, J. J. Grinlinton, and Thos. North Christie; the shareholders present were Messrs. J. H. Renton, C. Oswald Mackwood, H. J. Vollar, Sholto G. D. Skrine, F. G. A. Lane, W. H. Davies, Eastern Produce and Estates Company by their attorney, C. B. Smith by his attorney, F. M. Mackwood, H. D. Deane, A. Vanrenen, Gilbert F. Traill, F. G. Bewes, A. Bethune, H. V. Lushington, H. L. S. Ingles, J. F. Headrick, H. Bois, P. Bois and V. A. Julius.

The Hon. W. W. MITCHELL, who acted as Secretary, read the notice calling the meeting, and the minutes of the last meeting held on the 12th February 1890, which were confirmed.

The CHAIRMAN said that he would make a few remarks to point out the necessity of calling the meeting. The necessity had arisen from a letter which they had received from Messrs. Wattson & Farr of New York, dated May 15th. The letter would be read to them presently, but its main object was to point out Messrs. Wattson & Farr's opinion that a very much larger business might be done in Ceylon tea in America by the co-operative system, as they called it in America. There were many ways of doing things in America which were strange to them, and which might at first seem beyond their ken, but Messrs. Wattson & Farr's idea was to make a number of persons in fairly good circumstances shareholders in this Company, to allot them so many shares, and to supply them with tea, holding their shares fully paid up as security, and to make them, in fact, the Company's agents; to appoint them in all the various small towns, and to get them to travel about and do as much as they could to increase the volume of the sale of Ceylon tea. The directors had given the proposal of Messrs. Wattson & Farr their deepest consideration. They proposed to raise a capital of one million dollars, and to apply to the present shareholders two shares of 20 dollars each for every one share that they now held, so that the holder of a share worth R50 would, at the present rate of exchange, get an amount equal to about R108 for his share, provided he chose to remain and amalgamate with the American Company. Messrs Wattson & Farr proposed to reserve 10,000 shares as the working capital of the concern, and they proposed to take 28,000 shares for themselves and the promoters of the Company. The Directors thought that a great deal too heavy an amount: they objected to it, and telegraphed to Messrs Wattson & Farr pointing out their objection. He would ask the Secretary to read the telegram that was sent.

The SECRETARY said that the following telegram was sent on the 1st of July:—"Directors provisionally approve—promotion shares deemed excessive—shareholders called—writing." In reply to that came the following telegram:—"Promoters fully considered all points—cannot alter conditions—Delay likely prove disastrous—Prompt confirmation most important." An answer was sent:—"Will cable you on 11th"—this date.

The CHAIRMAN, continuing, said they would see that although the directors immediately took steps and objected to so large a proportion of the shares being allotted as promotion money, the promoters in New York seemed to think they would require that large sum of money in order to promote the Company and to push the concern. There was no doubt that a very large sum of money would be necessary, but whether the sum named was absolutely necessary or not it was very difficult for them to say. But they did think, as a Board of Directors, taking all matters into consideration, that whatever was done must be done promptly. Their great object was to push the Ceylon tea enterprize, and they considered that they would be able to do a very much larger and much more extended business in accepting this scheme. (Hear, hear.) One thing was perfectly certain, and that was that the Company had not been supported either at home or in Ceylon as well as it ought to have been, seeing the very heavy expenditure in working anything of the sort in America, and they thought it would be to the mutual advantage of the shareholders if they would agree to amalgamate the Company under the proposals made by Messrs. Wattson & Farr. The directors wished to take the shareholders entirely into their confidence in the whole matter that had been laid before them, and therefore he would ask the Secretary of the Company to read the letter which had been received from Messrs. Wattson & Farr, and then to read the reply which was sent.

The SECRETARY then read the following correspondence:—

New York, May 15th, 1890.

Messrs. Darley, Butler & Co.,
Agents and Secretaries, Colombo.

Dear Sirs,—Since last writing you we have your esteemed favours of March 26th and April 8th, contents duly noted, and all enclosures in order.

Mr. Pineo has continued to use his best efforts in increasing sales of Tea, and we see signs of a growing interest amongst those who have given the article a fair trial. At same time the increase is very slow; and to make the Company a success, some vigorous and extended effort must be made.

We have been, as we have already written you, much interested in the experiment, and have given the matter our very careful attention, but must say that had we known how small a proportion of the Company's shares would have been taken we should have hesitated about accepting the agency, and would most probably have advised that the attempt to start the business should not be made. We have done our best with the funds provided, and feel that all the money spent has been used to the very best advantage, but with the present resources of the Company it is only a question of a few months, when all the money will have been spent and the business simply started.

It has been, therefore, a matter of considerable thought with us to advise the best way to avert the impending disaster to the Company, and make the efforts and money already expended the stepping-stones to a permanent success.

You may or may not be aware that the co-operative principle in many forms of business is taking great hold of our people at the present time, and after careful investigation of the matter, we are of the opinion that this co-operative idea can be used with marked success in the promotion of the plans of this Company.

We have in this country a very large class of people, who have some means and are able to live without going in for any very engrossing business, but who in many instances would be very glad to add to a small income by some clean and reasonably profitable occupation, without losing their independence. These

people live in the small towns throughout the country, and would be in a position to have a horse and waggon at their command, to drive about through the country soliciting trade.

We have secured the interest of parties here whose business it has been to reach this class of people, and who have the necessary machinery and experience to interest them in any good legitimate enterprise; and our plan is to secure an agent and stockholder from amongst this class, all over the country, commencing in our more thickly settled States, near at hand, and lying within a convenient radius, around our principal cities.

No agent will be appointed who does not subscribe to some shares, and he must be qualified and undertake to push the interests of the Company in the territory that may be assigned him. The amount of shares would vary from $100 to $1,000, and he would be allowed to deposit his shares (fully paid up, of course) as security for tea sold to him which would be billed at a price to enable the agent to make a handsome profit, at the same time giving the Company a handsome return. He will have the double incentive of a profit on sales and a dividend on his stock, besides which his ownership of stock will give him an interest in keeping at work in his territory even should sales not prove large at first, as he would realize that his investment in the stock would prove valueless, unless himself and his fellow agents all continue to work for the common good.

Whilst working up the class of people we have referred to above, we do not by any means propose to neglect the principal cities, but would work them into co-operation in the general business either by means of local agents or by establishing branches of the Company itself.

Our idea in brief is as follows:—To incorporate a Company (American) under the same title as the present with a capital of ($10,00,000) one millon dollars, divided into shares of ($20) twenty dollars each fully paid up, and non-assessable, incorporate under the law of this State, and without liability to the shareholders. The shares to be divided as follows:—

10,000 shares to be placed in the Treasury of the Company to be sold at par—say $20,00,000 for the working capital of the concern.

12,000 shares to be paid to the shareholders of the present Company, say 2 shares for every one, and 28,000 shares to be paid to ourselves and the parties who will work with us in raising the capital and floating the enterprise, and we would all have to give much time and labour to the matter, and advance a great deal of money for advertising, travellers, &c. &c. before we could look for any returns.

It is not by any means our desire that any of your present stockholders shall part with their holdings, but rather that you may get increased subscribers, but we can doubtless arrange that any who do not wish to accept the 2 shares of the new Company for the one of the present Company shall receive the amounts they may have paid in, upon surrendering their shares. Still less is it our desire that any of the present Directors should be displaced, as we wish to have the new Company to be the outgrowth and harmonious result of the present one, and only such changes or rather additions to the Board of Directors would be made as might be found necessary by our local laws and to enable us to have the proper working board and officers here, where the work would have to be done.

As we understand the matter, the present Company was gotten up, not with much idea that the shares would be directly profitable, but with the prospect that they might, and the direct object of exploiting Ceylon tea in this country. The money that has been so far paid in has been, or soon will be, used up and unless some decided steps are taken, will be lost. Our friends who are back of us in the proposed new Company say: Why should we bother with the old Company at all? We can buy all the Ceylon tea we want, make our own boards, &c. &c.—and have the whole matter in our own hands, as well as any profit. We have insisted, however, that as we have been your agents, and through you have become interested in the matter, that we would have nothing to do with the business, unless the present Company was merged or in a measure continued in the proposed new one, as we wish it to be a representation *strictly* of Ceylon industries.

Our proposed plan may seem visionary to you, but this is a large and growing country, with an active and speculative population, who are always ready to take up a good scheme on a big scale, and we have with us men who have made a study of introducing Companies such as we propose, and who will give their time, money and experience, with the hope of making their interest in the stock valuable, which of course would be equally shared in by all stockholders. If the Company should succeed, and we think it will, Ceylon tea would be more thoroughly and successfully introduced into this country than by any other means we know of.

Mr. Pineo is fully in accord with the matter stated herein, and as we shall have to commence operations as soon as possible, we will ask your very careful consideration, and would request you to cable us your decision, say "approve," if, as you are authorised by Article 7 of your bylaws, you will give us the option of buying out your Company, for say 12,000 shares of the new Company, we (personally) agreeing that if the new Company is undertaken, that we will take up any shares of parties who may now be stockholders, should they not wish to accept the proposal. —Yours very truly,

(Signed) Wattson & Farr.

1st July 1890.

Messrs. Wattson & Farr, New York.

Dear Sirs,—We addressed you on the 26th ultimo, and have now to report that a meeting of Directors of the Ceylon Planters' American Tea Company was held this day and we were desired to express their obligations to you for the great interest you have throughout manifested in the welfare of the Company and in the introduction of Ceylon Tea into America which have led to the proposals you have made with regard to the new scheme put forward in your letter of 15th March. Whilst recognizing the desirability of carrying on the Company's operations on a much more extended basis than at present, some of the Directors do not regard the position of the Company in a desponding manner and as one liable to end in disaster at an early date as you seem to think, but however this may be, they expressed themselves generally in favour of the scheme and we telegraphed you today "Directors provisionally approve—promotion shares deemed excessive—shareholders called—writing."

The only matter connected with your proposals about which there seems to be a difficulty, is in regard to 28,000 shares to be appropriated to yourselves and the parties who will work with you. There seems to be a difficulty in understanding what the reservation of such a large number of shares as 28,000 is for; what equivalent the Company is to get for such a large allotment which amounts to more than half the proposed capital of 50,000 shares; and we are desired to ask if it is the intention that the 28,000 shares are to be allotted to you for your services in placing the 10,000 shares, the proceeds of which alone will be placed in the coffers of the Company to form its working capital? We understand that you would take up the balance of shares in the old Company that is unallotted, and that you would make yourselves liable to refund to any shareholders in the present Company the value of their shares if they did not agree to the new scheme. We presume it is your intention to expend a large sum of money—and if so about what amount?—in raising the capital and floating the new concern, advertising, travelling &c. in connexion with the promotion of it, and the appointment of local agents, recouping yourselves from what you may obtain by selling some of the 28,000 shares, and not repaying yourselves from the proceeds of the 10,000 shares which will remain and form the working capital of the concern?

We would have been glad to have had an explanation of this from you prior to the meeting of the share-

holders which has been called for the 11th inst., but of course this cannot be. At this meeting it is intended that the Directors shall obtain the permission of the shareholders to amalgamate if they agree to do so; and if they so agree, Mr. Grinlinton, the Managing Director of the Company, who will, as we have advised you, proceed to New York, will be authorized and empowered to discuss matters with you, and to finally conclude such terms as you may mutually agree upon. In short, as the matter presents itself to us, at present the feeling is, that the payment in shares for promotion should be less, and that the number of shares to be sold for the benefit of the Company should be more; otherwise 4-7ths of the share capital will have been paid away or alienated outside the Company, whilst at the same time, dividend is payable upon these shares out of the earnings of a working capital of 1-5th plus the 12,000 shares to be held by the old shareholders of the present Company. We conclude that Mr. Pineo's services would be taken over by the new Company.

Mr. Grinlinton will take a full Power of Attorney with him so that no more time will be lost than is unavoidable, and, as his time will be very limited in America (not more than a fortnight at the outside), it is highly desirable that whatever preliminary steps may be necessary should be well in hand, and all prepared by the time he arrives. He will leave here by the "Parramatta" mail steamer (P. & O.) on 24th instant, expects to arrive in London on the 14th August, and he hopes to leave for America a week afterwards, arriving there about the end of August or within the first week of September.—We are, dear sir, yours faithfully, DARLEY, BUTLER & Co., Agents and Secretaries.

The SECRETARY also again read the telegrams given above.

Mr. SHOLTO SKRINE inquired as to what would be the liability of a shareholder in this new Company. It appeared that a shareholder would have two shares for every original share he possessed.

The SECRETARY:—He will have no liability whatever: 20 dollars will be the value of the shares.

Mr. SKRINE:—But the shares in the old Company will have to be paid up before a shareholder can have the new ones.

The CHAIRMAN:—When the whole amount of R50 is paid up those shareholders who wish to remain in the new amalgamated Company would receive in exchange for their one R50 share two 20 dollar shares, at the value of R108, which is taking the present rate of exchange. That would be the limit of liability, and there would be none beyond it, because you receive those two 20 dollar shares for the one R50 share you already hold. There is one other matter I want you to take into consideration, and that is the question as to the advisability of carrying on this Company in the way proposed. Myself and my brother directors think it is the most advisable course, after giving it all the consideration we possibly could, because it is quite open for any other body of men to form a Company and carry on business without us, as Messrs. Wattson & Farr say in their letter. I think our object all through has been to push Ceylon tea and to do the very best we could for it, and I think that if this Company is amalgamated with the new Company as is now proposed, we should not only achieve the object which we had from the first in view—that of pushing our tea, but I see no reason at all why it should not prove a profitable speculation also to the shareholders, as long as the terms are adhered to: *i. e.*, that the value of 10,000 shares is to be kept entirely as the working capital of the Company. It would be open at the same time to any shareholder who wished to withdraw from the amalgamated Company to withdraw from it. He has the option either of receiving two 20 dollar shares for his one R50 share, or he can withdraw from the Company by receiving the amount that he has paid up here for his share. If he has paid up R50, he can withdraw by getting his R50 back.

Mr. F. G. A. LANE:—Will the control of the Company then be in New York?

The CHAIRMAN:—Certainly.

Mr. LANE:—Not in Ceylon? Then what assurance should we have that they will buy and sell pure Ceylon tea?

The CHAIRMAN said that that was the condition on which they would be made agents, and they agreed to that. In the letter which had just been read Messrs. Wattson & Farr said: "As we wish it to be representative strictly of Ceylon industries."

Mr. LANE:—Will the tea as heretofore be bought in Ceylon, or in London?

The CHAIRMAN said that that was one of the minor arrangements which Mr. Grinlinton would make when he went to America, but they would have to make themselves perfectly sure that Ceylon tea alone would be sold.

Mr. SKRINE assumed that a large proportion of the 20,000 shares went to the Directors in America, or did the Directors here get any share? (Laughter.)

The CHAIRMAN:—No, I am afraid they do not.

Mr. HENRY BOIS asked if the object of the meeting was to elicit from shareholders an expression of opinion as to whether the proposal should be accepted or rejected, because it seemed to him utterly impossible for a body of men to seriously consider the figures put before them. The point that struck him more than anything else was the enormous proportion which Messrs. Wattson & Farr proposed should be allotted to themselves for promotion money. If he followed the figures correctly it amounted to this:—12,000 shares to be allotted to the present shareholders in the Company in respect of the capital they had subscribed; then they proposed to get 10,000 more shares taken up by the public in America; and they allotted to themselves 28,000 shares—for what?—their services. Did they propose to pay nothing in respect of them, or were they to be 28,000 fully paid-up shares, as promotion money? What it meant was that they, as the promoters of the Company, would have a claim upon the dividends to the extent of 58 per cent, the balance going to the shareholders who had subscribed the capital. He did not think that was a matter they could consider and give an answer to in the course of a few days. He, for one, most certainly was not prepared to commit himself either to an acceptance or rejection of the proposal at that meeting. No information was put before the shareholders, so far as he was aware, until they heard the letter which had just been read, and he thought the matter was far too important for them to come to a decision upon it at the present moment.

The Hon. T. N. CHRISTIE said what Mr. Bois had referred to was very much what they had to consider, but it was not a matter of merely granting time that would enable them to arrive at a satisfactory conclusion. What they really wanted was more information. It was hardly credible that a firm like Messrs. Wattson & Farr should propose to them that they should receive as promotion money shares representing nearly a quarter-of-a-million sterling. It was hardly conceivable that they could possibly imagine that they should agree to terms such as those. They used the rather ambiguous expression that they required that money for the floating of the enterprize. If they meant floating the Company he had no hesitation in saying that the request for 28,000 fully paid-up shares was monstrous; if by "floating the enterprize" they meant floating the business of the Company, advertising and pushing the business,

then it might or might not be a reasonable demand. The Chairman had used the expression "promotion money" as applied to those shares, but he could hardly imagine that Messrs. Watson & Farr regarded it as such, and he would take it that when they used the expression "floating the enterprize" they must mean to devote a great deal of time and a great deal of money to the pushing of the business of the Company, and not the mere promotion of the Company. He would point out to Mr. Bois that the one saving clause in the whole of the proposed arrangement which would justify them in provisionally accepting the offer that day, giving Mr. Grinlinton all powers to conclude, was the offer to return their money to those who, when they really learnt what the details were, were discontented, and preferred to have their money rather than to have deteriorated and depreciated shares in a concern which was burdened with having to pay a dividend upon a quarter-of-a-million sterling which had not been devoted to pushing the business of the Company.

The Chairman pointed out that what was stated in this letter was "that 28,000 shares were to be paid to ourselves (Messrs. Wattson & Farr), and the parties who would work with us in raising the capital, and floating the enterprize, and we would all have to give much time and labour to the matter, and advance a great deal of money for advertizing &c., &c., before we could look for any return." One thing he would point out to Mr. Bois was that they were not really presenting Messrs. Wattson & Farr with the value of 28,000 shares, but they had got to raise those shares, and the value of those shares, themselves, and although he used the words "promotion money" he used the word "promotion" as meaning the pushing of the interests of the Company. He did not mean that it was to be handed over to them as a lump sum for simply getting up the Company. The letter, he thought, was fairly clear,—it was for floating the enterprize, which included the advancing of a great deal of money for advertising, travelling &c. It was clearly intended that this money, which they should obtain by 28,000 shares, was to be used for the pushing of the Company, advertising and travelling on its behalf &c. They had to find the money, and probably would have to advance it for some time.

Mr. Skrine asked if they were to understand that Mr. Grinlinton would be in a position when he arrived in New York not to close with them at all if he thought it undesirable, and whether that meeting would only result in handing over the power to Mr. Grinlinton, in whose hands they would put their interests?

Mr. Talbot:—With an expression of opinion.

Mr. Skrine:—I understood that Mr. Grinlinton would have the power of attorney either to close with the Company, or, if he saw fit, to reject the proposal.

The Secretary:—I think you are referring to the terms of the letter which was written on the 1st of the month. A telegram was sent in reply to that, and the reply to that telegram makes it impossible to leave the question open. The telegram says they have considered all points, and if we delay in sending a reply we shall lose the opportunity. I assume that if we decline Messrs. Wattson & Farr will go on with the matter themselves. If we want to make better terms, and wait for a time, the opportunity very likely will have passed from us. As it is we have not got money to go on with very much longer, and then we lose everything. Here we have the opportunity of achieving the object for which the Company was started.

Mr. F. M. Mackwood said that there seemed to him to be two views of this question,—first of all the purely financial view, as it concerned themselves, and the broader view in which they would probably have to be content to sink their personal convenience in the matter as to whether this was the best company and means for introducing and pushing Ceylon tea in America. From the latter point of view it appeared to him to be a great improvement on the powers and scope of the present Company. On the other hand the majority of them had subscribed for a number of shares, and a very great number of them had practically looked upon it as a sort of contribution on which they expected to get no return, merely as their share towards promoting the prosperity of the Company. They did that on the assurance of the working Board of Directors—men whom they all knew, and who were working in their midst. To transfer that work to America, amongst a body of men whom they did not know, and whose figures, as Mr. Bois had stated, were, to say the least, rather staggering, was a different matter, and he was rather inclined to say that if it were not for their offer to give anybody's money back if they did not care to go in for the new Company, that it was a proposal not altogether satisfactory.

Mr. Henry Bois asked if it was intended that that meeting should accept the offer of Messrs. Wattson & Farr, simply giving the power-of-attorney to Mr. Grinlinton to carry out the details of it, or was it intended that he should have authority either to accept or reject the proposal when he arrived at New York.

The Chairman said that the position in which they were at present was that they had to reply to Messrs. Wattson & Farr's telegram. The Secretary of the Company has just stated that the Company would not be in a position to carry on very much longer. It became a question with the shareholders as to whether it was advisable to let slip this opportunity of amalgamation with a large Company to be formed in America, and if they approved of the amalgamation then they would distinctly have to telegraph to Messrs. Wattson & Farr that they were prepared to accept their terms, but qualify it by stating that Mr. Grinlinton would be sent over with power of attorney, deputed as their Managing Director, to go into minor details with them. But he thought that if they attempted to gain longer time, and to put them off in this scheme, that they might just as well give up the whole idea, and he was afraid unless fresh support came in that it would simply mean the closing of the Company. When the Company was originally started with 6,000 shares they expected a very much larger number of shares to be taken up. Stress had been laid both by Mr. Bois and Mr. Mackwood on the large number of shares the promoters in America required. The directors saw that at once; it was the first thing they caught hold of, but it was such a very difficult thing to tackle in a country like America. If Messrs. Wattson & Farr meant that the value of the shares was to be devoted to advertising thoroughly, travelling throughout the country, and appointing agencies in all the small towns, it really and truly was not so very big a sum as it at first appeared, but if it were simply to go into the pockets of the promoters of the Company in America it would be simply monstrous. But in the face of their letter they could not take that view of it. That meeting must come to some conclusion. The letter which had been read was only received on the 18th of June; a directors' meeting was called at once; notice had to be given of

the present meeting, and they had been called together at as early a date as they possibly could be, to discuss the matter and form an opinion about it.

Mr. SKRINE thought the redeeming point about the whole thing was the fact that the American Company were prepared to meet the shareholders here by saying—"If you do not like it we will pay you up." Few of them expected to see their money back, and if the American Company paid them back they would be in a better position than they ever expected to be. For that reason he would suggest that the proposal be accepted and carried through. There was no doubt that the great object of that Company was to push Ceylon teas, not to make money out of the Company, and if they could get people in America to push Ceylon teas for their own interests, even if they did make a good thing out of it, they would indirectly make their fortune.

The CHAIRMAN said it must show confidence on the part of Messrs. Wattson & Farr in their being able to do something, for they need not have offered to pay them back their R50 per share. They could start their own Company, and pay nothing at all. He thought that the very fact of their offering to pay a shareholder a sum equal to R108 for his R50 share, or if he did not care to stay in the Company the money which he had already paid for his share, showed their belief in the company which they were prepared to start. In Ceylon they did not understand the mode of doing things in America. They launched out into enormous advertisements. Mr. Pineo had paid 100 dollars for one advertisement alone—he forgot how many times it was put in—in one magazine. The money was been very soon swallowed up, and if Messrs. Wattson & Farr were going to do the thing as they professed they would do it, and as they sincerely hoped they would do it,—they were a well-known firm—they would have to use a large proportion of those 28,000 shares.

The Hon. J. J. GRINLINTON, said he thought at this stage of the meeting it would be well if he made a few remarks on the subject of the power of attorney for the information of the shareholders. His object in going to America had nothing whatever to do with this Company. He decided on the trip long before that Company had any existence. He went there on his private business, and nothing else, but it was thought desirable by the Board of Directors, as he was a director of the Company, that if he were going to America he should render such assistance as was possible to that Company. His primary object in going was his own private business, and he would very much rather have nothing to do with the power of attorney or anything else connected with the Company, but be allowed to have his fortnight there to run about as he pleased. But having been asked by his co-directors to accept this responsibility—and it was a very heavy responsibility,—he might tell them that he should not accept it at all unless his position was defined, and defined in such a manner that he could not run away from it. He did not want to do anything outside the Company. He wanted to act, if he acted at all, within the decision arrived at, and not to be left with but's and if's and and's, or anything. He must have it stated distinctly what his powers were, and he would not exceed them, but he would much prefer not having anything whatever to do with it.

The Hon. T. N. CHRISTIE said that it might be concluded from what Mr. Kelly had said, which had been more or less supported by the Secretary, that the New York firm were dealing rather generously with them, and that they could have started quite as well without them. That was rather out of it. To the New York firm it was very essential that they should get the same name that they had, and it was obvious that their desire was to secure the *prestige* which attached to the name, and from the patronage which that Company gave. It was their very natural desire to continue that Company, and not go against it. With reference to the remarks made by Mr. Grinlinton it would be obviously impossible for the shareholders to define what he should do in New York. What the shareholders had to do that day was to authorize the Board of Directors to give instructions to him. It was not likely that the conditions would be made known generally that day, and at such a meeting.

Mr. H. BOIS :—May I ask how many shares have been subscribed for in the local Company?

The SECRETARY :—1,747.

Mr. BOIS :—Are there any calls unpaid?

The SECRETARY :—There are 31 defaulters, owing R1,740.

Mr. BOIS :—Otherwise the capital is all called up?

The SECRETARY :—R35 paid up, R10 payable on the 1st of October, and R5 to be called up after that.

Mr. MACKWOOD :—I understand you to say that if we did not adopt this proposal, even with the call that has to be made, we should have to stop in a comparatively short time. It would almost seem, if this is the state of affairs, that we have absolutely no choice, and the proposal of Messrs. Wattson & Farr offers as the only chance of ever seeing any of our money back, for if the Company should stop there are practically no assets that could be converted into capital. It is not as if we had a stock of tea on hand.

Mr. LANE quite concurred in their Company being taken up by this American Company, and of the directors being empowered to accept their terms, but at the same time he thought it should be distinctly stated by their directors, and they should say to their directors that day, that the tea that had to be bought should be bought from Ceylon and not in London, so that they themselves might know what sort of tea it was that was being sold in their name. He thought Mr. Grinlinton should make that a *sine que non*.

Mr. C. S. ARMSTRONG was afraid, in the present condition of the Colombo market, that they would be unable to supply the demand.

Mr. SKRINE said that it appeared to him that they were hardly in a position to carry out Mr. Lane's suggestion that day, because Messrs. Wattson & Farr, as he read the telegram, had told them distinctly that they must either accept the terms offered, or they must let the thing slide. That being the case, considering the circumstances, he thought it was far better to accept the position, and he proposed that Messrs. Wattson & Farr's suggestion be accepted.

Mr. LANE had pleasure in seconding the motion.

The CHAIRMAN said that they had already shipped 32,962 lb., 12,499 lb. of which had been sold, and in shipping that quantity they were not able to obtain all the tea of the description they required in the local market, and had to get some of it in the London market, so that if the proposed American Company were to be a big concern, which they wished it to be, he trusted it would be a bigger concern that the local market could supply, at present at all events. As long as they made it a *sine qua non* that the whole of Messrs. Wattson & Farr's transactions were to be in purely Ceylon tea, he thought they must trust to the honour of the firm.

Mr. GRINLINTON thought it might well be put, as a request from the shareholders, that the Ceylon market—*i. e.* the local market—should be availed of as much as possible. He might mention that on

two or three occasions when they went into the market with samples they had furnished from America, they had been unable to get those teas, and had been obliged to put it off for another season.

The CHAIRMAN also pointed out that the present Company was trading under the auspices of the Planters' Association. Naturally they were only interested in the pushing of Ceylon tea, and if for a moment it were discovered that other than Ceylon tea was being pushed that patronage would be withdrawn at once.

Mr. LANE said he would be content if it were a *sine qua non* that the tea sold should be Ceylon tea, but he agreed with Mr. Grinlinton that it might be a recommendation to Messrs. Wattson & Farr to buy as much as possible in the local market. The inducement offered in the local market at present was not sufficient, so that many planters had to send their teas to London.

Mr. HARRY WHITHAM said that as far as he could see from Messrs. Wattson & Farr's letters they did not desire that the directors should be replaced, and they could buy the tea here. He would make it a *sine qua non* that the tea should be bought through the present directors.

Mr. SKRINE, having formally worded his motion, proposed—"That this meeting authorizes the directors to arrange the amalgamation with the American Company if they are satisfied with the terms offered,"—so that the onus of the thing rested on the directors. (Laughter.)

No amendment being proposed, and no further remarks being offered, the Chairman put the motion, and it was carried unanimously.

The CHAIRMAN then said that having carried that resolution there were some other resolutions which were merely formal. They had been drafted by their legal adviser, Mr. Julius, who had gone carefully through their Articles of Association. The resolutions were as follows:—

I.—That the Directors of this Company are authorised to arrange terms for the sale or disposal of the business estate and effects of this Company to a Company about to be promoted in America for the sale of Ceylon tea upon such terms and in such manner as the Directors shall think fit.

II.—That the Directors of this Company are authorised to delegate their powers of arranging terms for the sale or disposal of the business estate and effects of this Company to any one member of their body and to grant to such member a Power of Attorney to act in America for the other Directors of this Company and for this Company and to arrange and enter into terms for the sale or disposal of the business estate and effects of this Company to a Company about to be promoted in America for the sale of Ceylon tea and to sign all necessary contracts and agreements on that behalf with any person or persons acting for or on behalf of the said proposed Company.

III.—That a Power of Attorney be granted to the Hon'ble J. J. Grinlinton by the Company under sec. 44 of the Joint Stock Companies Ordinance No. 4 of 1861 empowering him to arrange terms for the sale and disposal of the business estate and effects of this Company to a Company about to be promoted in America for the sale of Ceylon tea and to sign all necessary contracts and agreements on that behalf with any person or persons acting for on behalf of the said proposed Company.

These resolutions having been separately proposed, seconded and carried, proxies were handed in, and the meeting concluded with a vote of thanks to the Chairman.

There was one slip made by both Mr. Bois and Mr. Christie—they said that the 28,000 *promotion shares* represented "¼ of a million sterling." They were wrong—at twenty dollars each it is £116,000 sterling.—*Secretary*.

PLANTING IN NEW GUINEA.

A DIRECTOR OF A NEW PLANTATIONS COMPANY.

A German gentleman named Mr. Kendt, with his wife and five children, arrived at Colombo on Saturday in the N. L. steamer "Nürnberg." They are at present staying at Mount Lavinia Grand Hotel, and intend to remain in the colony for a fortnight, when they will proceed by the "Preussen" to Singapore, and afterwards to New Guinea, where Mr. Kendt will act as director of the New Guinea Plantations Company. Mr. Kendt, we believe, has really been engaged by the German New Guinea Company to plant cacao and introduce other products. He has been in Trinidad, and besides being a specialist as regards cacao he is what may be called an all-round planter. Coconuts are the principal product of New Guinea at present, but there are also experimental plantations of tobacco, cotton and coffee. With the object of improving the cultivation of these things in New Guinea, and introducing new products, Mr. Kendt will spend most of his fortnight in Ceylon upcountry, visiting various estates of cacao, coconuts, tea, &c. He will probably try the latter on the New Guinea plantations, and the industry generally will receive an impetus on his arrival.

THE AFRICAN FOREST.—Since I have made my map I have taken the trouble to measure the extent of the area covered by this forest, and I find it to be something like 224,000,000 acres; and if we allow each tree 30 feet around for sufficient space, and only forty-eight trees to the acre, we have the colossal figure of 10,752,000,000 as the total number, and if we calculate the plants and saplings of the impenetrable undergrowth we shall be among the incalculable billions.—*Stanley's Address to the Royal Geographical Society*.

PLANTERS AND COOLIES.—A Province Wellesley planter writes to the *Pinang Gazette* to remove misapprehensions arising from the recent discovery of alleged ill-treated coolies on a Chinese estate there. He accounts for the neglect of sick labourers by the fact of Chinese being callous in cases of illness and putting no faith in medicine. He points out that the so-called debt slavery comes to nothing more than requiring coolies to work off the advances, without which they would not ngage themselves, a system authorised by Ordienance. On his showing, employers want more protection than Chinese coolies who, so he says, are more rogues than fools.—*Straits Times*, May 16th.

BRAZIL COFFEE.—There is a considerable touch of exaggeration in a recent report of Mr. Consul Cowper of Santos which has been going the round of the London papers, speaking of São Paulo district—or rather series of districts which find their outlet at Santos as likely to put those shipping through Rio de Janeiro completely into the shade. Last year July 1888 to June 1889, Santos exported 3 million bags; this year 1889-90 the total is likely to be a million short (the alternate crop) or 2 million bags; but Consul Cowper expects over 3 millions in 1890-91 and that the immense districts now being brought into cultivation will soon assure 5 million bags (132 lb. each) and therefore equal to nearly 6 million cwt. But when the worthy Consul values the current crop of 2 million bags or 2,357,000 cwt. at £12,000,000 sterling we can see that he "draws the long bow" or has a good deal to learn about coffee. The day has not come when coffee at Santos can be valued at over 100s per cwt. all round.

BENNETT ON TEA AS INDIGENOUS TO CEYLON. —"Old Resident" writes:—"As it is highly improbable that even as a garden plant the true tea existed at Batticaloa, it does not seem likely that Crawford could have sent Bennett a specimen of real tea in flower, or that Bennett's sketch was made on such a specimen. The strong suspicion is that instead of sketching Crawford's specimen he copied a picture of the true tea plant and then wrote positively of its existence in Ceylon."

JAVA: THE EXPORT OF TEA from Java is officially reported as follows:—

	lb.		lb.
1882 ...	5,900,400	1886 ...	7,385,400
1883 ...	5,852,000	1887 ...	7,026,800
1884 ...	5,572,600	1888 ...	7,477,800
1885 ...	5,328,400	1889 ...	7,682,400

Java does not therefore make much progress as a tea-producing country, and her tea is also of poor quality still, notwithstanding the introduction of late years of good Assam seed, and of machinery for preparation.

IRRIGATION AND SANITATION.—An interesting point in the recent report of Colonel Skipwith on the Irrigation of the North-Western Provinces is the result of a deputation made last January to examine the country between the East Kali Nadi and the Burh ganga, in order to ascertain, as far as possible, the extent the saturation level had been raised by the Fatehgarh Branch Canal, and to report on the measures necessary to relieve the land suffering from swamping. The report, which is now in the Press, ought to be of general as well as special value, for the problem of which it treats is one of the most difficult with which the irrigation authorities have to deal. There are many districts where a succession of dry seasons would bring starvation on the people were they not served with canal water, but where, also, if canals be construeted and there come one or two seasons of excessive rain, the land becomes water-logged, and fever and sickness are stimulated. The construction of canals being necessary, the question is how to keep down the water-level in rainy seasons. The problem is mainly one for drainage experts to settle, but the solution is of the greatest importance to the cultivating community. —*Indian Engineer*, May 31st.

FUEL CONSUMPTION ON INDIAN RAILWAYS.—One of the heaviest items in the working expenses of Indian Railways has been that of fuel and consequently the railway authorities have endeavoured from time to time in every possible way to reduce this expenditure. Mr. C. E. Phipps, the Acting Locomotive Superintendent of the Madras Railway, has recently devised a means of securing economy in fuel expenditure, and his experiments in this direction on three of Sharp Stewart's engines hauling the mail trains during the past few months have been comparatively successful. Mr. Phipps' expedient consists of a small masonry arch of fire bricks of the thickness of three bricks, erected on brass plugs just underneath the last row of tubes of the engine, in the copper fire-box of the locomotive, as also the provision of a double damper. The result of this is that the heat which heretofore passed off quickly is now thrown back by the arch and re-utilised before quitting the engine's fire-box; and as a resultant the consumption of fuel is less. After some further experiments Mr. Phipps it is understood, will take out a patent. But not alone on locomotives has Mr. Phipps' attention been engaged in regard to the consumption of fuel but also in respect of stationary engines at the Perambore Workshops. Hitherto the saw-dust from the saw mills at the workshops was either given away or sold for a trifle. Mr. Phipps is now utilising the saw-dust for fuel in a stationary engine at the shops, and has succeeded in raising with it 80 lb. of steam, a quantity sufficient to work the saw mills there.—*Indian Engineer*, June 7th.

NORTH BORNEO TOBACCO.—The report of the Labuk Planting Company, Limited, to be laid before the first ordinary general meeting of its shareholders at Hongkong on the 5th, stated that 250 fields were under cultivation for this year's crop, which is expected to be large and good, provided the weather prove favourable.—*Straits Times*, May 18th.

NITRE DEPOSITS.—Caves containing deposits of earth with from 4 to 30 cent. of calcium nitrate and 5 to 60 per cent. of calcium phosphate are common in Venezuela not only in the littoral mountain chains, but also on the flanks of the Cordillera of the Andes. In these deposits are embedded remains of mammalian bones, preserving their form, but so friable as to fall to powder when they are extracted. They consist solely of calcium phosphate; the gelatine has been nitrified and dissolved out, and the calcium carbonate of the bone has been used up in neutralising the nitric acid produced. The nitric ferment is found in abundance throughout the deposits in a very well-developed form. Some of these deposits are ten metres thick.—*Jour. Soc. Chem. Ind.*

COTTON GROWING AMONGST THE DON COSSACKS.—The persistance with which Russia struggles to make the country self-contained and the people a self-sustained one is a phenomenon which has long been noted, and to the permanence of which contributory evidence of the most recent date is seldom wanting. Our Consul at Taganrog reports that trials were made during the past year's season for growing cotton in the Don Cossack territory, and, as the results received were very favourable, further experiments will be made by members of the Agricultural Society during the present year. It thus appears that Russia has by no means abandoned her intentions in these districts of her widely extended territory.—*Textile Mercury.*

CALEDONIAN BALSAM.—At a recent meeting of the French Société de Thérapeutique, Dr. Forne called attention to the advantages presented by a preparation that he had named "baume calédonien," and which appeared to consist of a solution of Kauri gum in an equal weight of 90 per cent alcohol. He stated that it had been used with great success in the treatment of wounds and ulcers of all kinds. When applied to a well cleansed and dried wound it causes a very slight, but brief sensation of burning, but after a few moments the solvent evaporates, and the resin is left as a very adherent varnish, which is not affected by friction or contact with water. The preparation can also be used advantageously for fixed bandages in the place of the soluble silicate. It was also said to be superior to tincture of benzoin for the obturation of the cavities in carious teeth. Lastly, a liniment made with equal quantities of baume caledonien and olive oil was recommended as an application to burns.—*Oil, Paint and Drug Reporter.*

NOTES ON AGRICULTURE IN BALASORE.—*Wild Paddy.*—Mr. Cleghorn presented a drawing of wild paddy, which is very common in Orisa where it constitutes a serious evil. It flowers at the same time as the cultivated kinds, and appears to cross fertilize them to such an extent, that in a few years the cultivators have to import fresh stock from other districts. The wild paddy is not readily distinguishable from cultivated kinds in appearance, but it sheds its seeds so readily that it cannot be harvested; and this peculiarity is imparted to the kinds which it cross fertilizes. When importing fresh stock the cultivators select kinds with stems of a different color to that which they had in cultivation. Thus assuming that a light colored stem paddy has been cultivated, and deteriorated from cross fertilising; the stock chosen is dark stemmed, when this in turn deteriorates, light stem kinds are reverted to the difference in color being of material assistance in weeding out undesirable kinds. As Mr. Cleghorn has left Balasore, members on the spot will be asked to further investigate the subject.—*Agricultural and Horticultural Society of India.*

A FEW PRACTICAL SUGGESTIONS CONCERNING QUININE.

BY PROFESSOR DR. C. BINZ OF BONN.

The study of the employment of qninine in uncivilised fever lands leads to the conclusion that in such countries it is to tbe traveller as essential as gunpowder. The one he must have to protect his existence and property against greedy and treacherons native chiefs, and the other to secure his life against the malaria fever.

G. Schweinfurt relates that he rendered himself proof against the effects of a prolonged sojourn in pestilential swamps by the fortifying influence of qnionine taking ½ gramme* three times a day. It was an extreme case. For by the very nature of his occupation, namely, botanising in the swamps and wading among the papyri, he was completely exposed to the malaria, and constantly inhaling its fatal breath. Nevertheless his health remained unimpaired until by return to the pure air of the interior he was enabled to dispense with the further use of quinine. (Im Herzen von Africa. Reisen and Entdeckungen 1874 I. 137 und 352.)

Iu bis work "Through the Dark Continent," H. Stanley tells us how three attacks of fever reduced bim seven pounds in weight. But he "quininized" himself thoroughly from dawn till sunset, and came out on the fifth day pale, weak, trembling, with jaundiced eyes, beating heart, and singing ears, but the fever was overcome. And in his book on the Congo he speaks of another fierce attack of fever which he also conquered by large doses of three, and three and a half grammes of quininc, together with a few drops of hydrobromic acid and a little Madeira. He felt the strong medicament stream like lightning through his veins, and gradually creep with overwhelming force over his senses. But twenty our hours sleep followed, the fever was gone, and though terribly reduced in strength he was able to slowly recover.

C. Nachtigal briefly terms quinine "the greatest of treasures to travellers in tropical regions."

I give the above as only a few voices among countless others. Respecting the value and importance of quinine, the evidence is vast and unanimons.

It teaches us that in preparing for a journey to fever-stricken lands, quinine should be obtained in the very best, purest, most effectual form. Tbis is however very rarely the case. The consequence is that the most serious risks are constantly incurred. Travellers and officials even lose their lives, or have to change their plans, or give them up altogether, To remedy this so far as lies in my power, I beg to submit to you (Deutsche Colonial-Zeitung) the following observations. They are the result of years of constant practical and experimental study of the subject.

The two chemists who first produced quinine from the Cinchona bark, did so in the form of the sulphate, and probably more by accident than intention. At all events in that form quinine passed into commerce, and so has remained for the last fifty years. Most physicians from habit and custom know and prescribe only the one salt; most pharmacopeoias even know no other, and in tbe last Prussian, it also remained tbe only recognised form of quinine, until on my proposition, the hydrochlorate was also included in the German pharmacopoeia of 1872. Since then the consumption of the hydrochlorate has gradually increased, but still remains considerably smaller than that of tho sulphate, about 1,750,000 oz. of the former being consumed in the world, against about 5,250,000 oz. of the latter. There are civilised conntries, as North America for example, where even now the sulphate is exclnsively in vogue.

Without being a chemist, one can easily understand the difference between the two kinds, remembering their difference in solubility in water. The sulphate demands about 800 times its weight of distilled water to dissolve perfectly, whereas the hydrochlorate requires only 50 times.†

* About 7¾ grains.—ED. *T. A.*

† 23 grains.—ED. *T. A.*

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By the addition of a little free acid the solubility is increased, but also in such case greatly in favour of the hydrochlorate over the sulphate. What is the consequence? As long as the human stomach is in a healthy condition it developes of itself free hydrochloric acid sufficient to change even the sulphate of quinine into that form in which it can be mo.. readily assimilated. But whenever the stomach becomes subject to disorders involving the diminution, or even total disappearance of such natural acid, the power of solution and assimilation of course terminates, and the medicament that by reason of its low specific gravity is very voluminous, remains as so much worse than useless ballast in the already weakened stomach. This is one reason why so many lives are lost annually notwithstanding administration of quinine. It is clear that with the sixteen times greater solubility of the hydrochlorate, the risk of its remaining inoperative in the stomach is considerably diminished. In numerous cases the hydrochlorate will dissolve and enter the blood, while to the sulphate this is impossible. It is precisely its insolubility in weakened stomachs that explains why in so many cases of fever, the otherwise so potent and reliable quinine is absolutely useless. The quinine passes for the most part into the lesser intestine where the conditions for assimilation by the blood are the more unfavourable, since the reaction bere is purely alkalic, rendering solution even more difficult.

The addition, or the drinking afterwards of any acid beverage that is otherwise suitable or congenial to the stomach, of course greatly tends to facilitate the assimilation of the quinine. Stanley was quite right in taking hydrobromic acid and Madeira. The former, however, that is in general difficult to procure, and an acid moreover that readily decomposes, was not absolutely necessary. Diluted muriatic acid would have done equally well, or any agreeable fruit acid. All good spirituous drinks are also energetic solvents of quinine. Such however are not always obtainable when travelling in fever countries, or for other reasons may not seem advisable to administer. In such case, tbe best of all aids is strong carbonic acid water. One should, however, take with one that preparation of quinine which in all cases is the most easily assimilated, and that is tbe hydrochlorate.

Up till within the last few years impure or even intentionally adulterated quinine often changed hands in commerce. A criminal suit in Berlin in 1886, and another in Paris in 1883 on account of such adnlterations created some sensation at the time. The most frequent surrogate were the subsidiary alcaloides of the Cinchona bark that are much cheaper than quinine itself, but also much less effective against the Malaria poison. Things in this respect have grown better, the more so since quinine has seemingly fallen permanently from the high price to which it was driven by speoulation. Yet whoever visits the interior of Africa must not rely simply upon the improved quality of quinine. He must obtain his supply from the best sources and even then submit it to the prescribed tests.

Much has been lately spoken on the question whether quinine has a preservative influence against fever. It is obvious that this question is of the greatest practical importance. In my opinion the matter lies thus.

In consequence of imperfect trials, one came to the conclusion that quinine exercised no really prophylactic influence, and this opinion was accepted and promnlgated by certain careless editors of medical handbooks. In reality, however, too little quinine had been administered, or if enough, in inappropriate form. Other physicians who had examined the matter with more care and attention met with better resnlts quite in accordance with Stanley and Schweinfurth's own personal experience. I am inclined to lay the more stress upon tbis, since the errors in treatment referred to can be easily recognised. Fresh experiments have been recently made by Dr. C. Graeser who published the results in the Berliner klinische Wochenschrift 1888 No. 42. As navy-ur geon in the Dutch service he had ample oppo-

tunity of studying the question at the notorious fever port Tandjong Priok near Batavia. His experience completely asserts the prophylactic, or preservative effect of quinine, and is moreover confirmed by that of his successor, as I learn by personal communication from him. Every time his ship arrived at Tandjong Priok, Dr. Graeser gave every one of the crew one gramme of quinine dissolved in geneva, and repeated such dose on the 8th, 12th and 16th days after arrival, administering also on the intervening 10th and 14th days half a gramme. His successor Dr. Buwalda varied the treatment somewbat. Already three days before arrival at the port named, and also during the whole sojourn on the coasts of Java and Sumatra, a period of five weeks, every man received a gramme of quinine three times a week. The quinine was likewise dissolved in geneva. With Graeser the interval between the first and second dose was somewbat too great. His successor by shortening the term obtained also better results. The geneva was employed chiefly with a view to inducing the sailors to submit to their regular dose of physic. With educated patients the use of alcohol might be dispensed with, provided that a moderate quantity be not demanded by weakness of the digestive organs.

Unless the country to be inhabited, or passed through is not altogether too pestilential, two doses of quinine a week may be sufficient. The effects should however on no account be frittered away by too small doses. All reports before me teach the uselessness of that, and the scientific view confirms it. On the other hand one need have no fear of any injurious consequences from such doses as those prescribed by Dr. Graeser and Buwalda. The evil effects often attributed to quinine should be rightly ascribed chiefly to the illnesses against which it is taken, or to unsuitable methods of administration. In these must be included, as beforesaid, the passing of the insoluble sulphate into a weak stomach, and in no better medium than a volume of water.

Springwater is almost always employed and of this, according as it is impregnated with lime and other substances, much more than the 800-fold volume will often be found necessary to get the quinine to dissolve.

That the prophylactic or preservative effects of quinine have their limit, is a matter of course, and we expressly mention it here in order that the failure of exaggerated expectations may in no wise affect our faith in what is really feasible. Whoever lives permanently under the influence of intense malaria may at last find the further employment of quinine impossible, since after all it is a substance foreign to our organisation, even though yet more hostile to the malaria poison. Like other things quinine is limited in its effects. Water is an excellent means of extinguishing fire, yet may be powerless against a conflagration, and though wool is a good preservative against cold, one may perish in the thickest clothes.

The well known fact in the present day that the malaria poison proceeds from decay of vegetable matter, and is itself in reality a species of lowest organism that affects us by penetrating into the blood, renders the preservative action of quinine perfectly intelligible. For if such organism on reaching the blood encounters that chemical substance to which it is especially sensitive, its developement and increase is arrested, and the consequences that would otherwise follow, fever, swelling of the spleen, disintegration of the blood are prevented. Quinine is not as formerly supposed, simply a tonic to the nervous system enabling better resistance to disease; only indirectly does it exercise such bracing effect.

No value should be attached to the many medicaments recommended as substitutes for quinine in cases of fever. Not one of them is at all equal to it in efficiency. Only arsenic can be sometimes substituted with advantage, whether however it can be so in general, and under such fluctuating conditions as a journey in wild countries carries with it, is unknown to me.

Hydrochlorate of quinine is somewhat dearer than the sulphate. In one of the latest pricelists I find the former given as costing 2/8 and the sulphate 1/8 the ounce. The difference is owing chiefly to the factories being arranged principally for the production of the sulphate on a large scale, and the hydrochlorate involving a further process. To the consumer however the difference in price is almost neutralised by the larger contents in the hydrochlorate of the pure alcaloid, 83 parts being contained in the hydrochlorate against only 74 parts in the sulphate. An equal weight of the hydrochlorate goes therefore much farther, apart from its greater solubility and easier assimilation by the stomach. Lastly the hydrochlorate of quinine is much more rarely adulterated than the sulphate.

GERMINATION OF SEED.

It is a common mistake to suppose that in order to produce a mature plant we must allow the seem to germinate, aud the resultant plantlet to fix itsed in a soil and draw nutriment by means of roots frolf mother earth. Any plant will grow as well in water if it contains the proper food stuffs in the proper quantities, as it will in soil of the very richest and most fertile kind. All that has to be done is to germinate the seed on a piece of moist flannel, and then transfer it to a jar containing to every litre (about 1¾ pint) of water the following quantities of the following substances:—1 gramme of nitre; ½ gramme of each of the following—sulphate of lime (plaster of Paris) sulphate of magnesia (Epsom salts), and phospate of lime. An iron nail must also be kept in the water to give to the plant the almost infinitesimal amount of iron which it requires. This mixture of water and salts must be renewed about once a fortnight. Of course the root portion only of the plantlet is to be immersed in the water; the stem part which bears the green leaves must be allowed to stand out freely into the air. In Germany it has been the custom for many years to set aside some portion of the botanic garden for the growth of plants of all kinds, from the smallest herbs to the loftiest trees, in food solutions of the kind described above, *i.e.*, by what is commonly known to botanists as the system of water culture.—*Indian Agriculturist.*

A NEW BAMBOO.

(BAMBUSA PALMATA, HORT.)

One of the most noble and distinct of all the Bamboos, so far as its foliage is concerned, is one sent to us under the above name by M. Marliac, the well-known specialist of Temple-sur-Lot (Lot-et-Garonne), France. Without flowering material, Bamboos are exceedingly difficult to make out specifically; but so far as leafage goes, the plant resembles Guadua or Dendrocalamus latifolia, as illustrated at plate vi of General Monro's *Monograph of the Bambusaceæ.*

So far, B. Ragamouski has been our largest-leaved species, but B. palmata has much finer leaves, and is more erect in habit. As sent by Mr. Marliac, the stems are 5 feet in height, with from five to seven leaves at their apices only; the largest of these leaves are 12 to 13 inches in length by 4 to 5 inches in breadth at their widest part. The figure (106), shows the stems and the leaves about one-third of their natural size. Above, the leaves are of a rich yellowish-green tint, finely lined or veined and below they are of a soft blue or glaucous hue. The plant is said to be hardy, but even if it should not be so under all circumstances, the plant is so noble and distinct in habit and leafage that it is well worth pot or tub culture in the greenhouse or conservatory.

It would be very interesting if the growers of Bamboos in continental gardens would tell us something as to the species and varieties they cultivate. Again, how many species are there hardy in Great Britain and Ireland? My own experience with about a dozen kinds is, that they will withstand a good deal of cold weather and actual frost, but that they will

not endure drought or dry scathing winds. In moist rich soils and sheltered positions they grow rampant, and add a grace to ordinary shrubs that no other hardy exotics can do.

Again, I should like to ask whence and from whom may seeds of Bamboo be obtained? The seeds germinate so readily, and, as General Munro pointed out in 1866 (*Trans. Linn. Soc. Lond.*), the young plants grow so rapidly that it seems a pity the hardier kinds of North China, Japan, the Himalayas, and the Andes cannot be reared in quantity.

Where is Arundinaria macrosperma of the Southern States of America now cultivated in Europe? One of the most distinct of all the dwarf kinds is one from Japan growing 2 feet high. Its leaves are about 3 to 5 inches in length by 1½ inch in breadth, and it acquires a variegated aspect from the withering and bleaching of the Margins of its leaves. Can anyone tell us the name of this peculiar species?—F. W. BURBIDGE. [Bambusa tassellata, hort., see p. 578.]—*Gardeners' Chronicle.*

LIBERIAN COFFEE, VANILLA &c.

Experimental cultivation has been carried on for some years at the plantation at Mergui in Burmah, but according to the report of last year, it cannot be said to have achieved much success. Liberian coffee was fairly successful, though the plants were attacked by white ants, and the crop was less than in the previous year. Great difficulty has been experienced in introducing the coffee for sale, as the first year's crop which was sold to a Burman was not properly prepared, and some persons declared that it was not fit for consumption. When the present Sub-Assistant Conservator of forests took charge he suggested that the coffee should be prepared by the department itself and sold locally, which was done; and though at first there was some difficulty in finding purchasers owing to the bad name acquired by the produce of the previous year, it was gradually sold off, and the purchasers were all pleased with its flavour. The crop of last year at once found a ready sale at R1-8 per viss, and the supply was not sufficient for the local demand, the coffee being pronounced much superior to that sold in the bazaars. The experiments with Arabian coffee proved a complete failure, and have been abandoned. The cocoa seedlings and plants suffered severely from the attacks of white ants, so that only twenty remain of 161. Only two of these produced pods, which have not as yet been collected. The vanilla plants grew well and flowered, but the flowers all died without coming to maturity owing to the absence of insects to disseminate the pollen, but an attempt is now to be made to fertilise the flowers by hand. There were 172 tea plants, but nothing is said about their produce, and the four cardamom plants all died, while specially selected seed sent from Mysore did not germinate. As the total receipts from the sale of produce amounted to R.272, and the expenditure to R617 it cannot be said that the experiments have proved profitable; but as the plantation only cost such a small sum it is to be continued.—*Indian Agriculturist.*

MORE TEA DEALERS PROSECUTED.

(*Special Report for the "Ceylon Observer."*)

At Greenwich Police Court, on Saturday, 21st June, George Westover, grocer, of 247 Lewisham High Street, and Kearley & Tonge, trading as tea merchants at Mitre Square, Aldgate, appeared before Mr. Marsham in answer to summonses under the Merchandise Marks Act, charging them with having sold or caused to be sold certain tea to which a false trade description had been applied, contrary to 50 and 51 Vict., cap. 28. Mr. Albert Gray, instructed by Messrs Sanderson, Holland, and Adkin, appeared to prosecute, and Mr. Asquith, Q. C., instructed by Messrs. Lewis and Lewis, defended Kearley and Tonge.

Mr. LICKFOLD asked that the case against the defendant Westover might be postponed, on the ground that the summons had only been served on the previous day. Mr. Gray said he had understood that the summons was served some time back, as the information was laid on 6th June. However, if the case against Westover was postponed, he would ask that the case against the other defendants should also be held over, because the former case should come first in order of priority. Mr. Asquith remarked that it was clearly the intention of Mr. Gray to use the conviction he hoped to get against Westover as a means of putting the screw on in the case against the other defendants.

Mr. GRAY explained that the Act distinctly provided for what his learned friend termed "putting the screw on." And the charge against Westover would never have been brought if he had only availed himself of the means of exemption provided. By a special clause the retailer was exonerated from blame if he could prove "that on demand made by or on behalf of the prosecutor, he gave all the information in his power with respect to the persons from whom he obtained such goods or things." This the defendant had been asked to do but had refused, and the prosecutors had been reluctantly obliged to proceed against him.

Mr. MARSHAM said that as the summons had not been served until the day before he thought that the request for postponement was very reasonable and he must grant it. He thought the case against the other defendants might very well be proceeded with at once. In reply to Mr. Gray His Worship added that he had no objection to the admission of the defendant Westover as a witness provided there was no objection by defendant's counsel.

Mr. ASQUITH:—My friend Mr. Lickfold may have something to say on that point presently.

Mr. GRAY, in opening the case against Kearley & Tonge, said the prosecution was instituted by the Ceylon Association in London. It was not a trading body, but an association of gentlemen connected with Ceylon formed for the purpose of protecting the interests of the Island.

Mr. MARSHAM:—I understand, then, that it does not represent any particular firm in this case.

Mr. GRAY:—Certainly not. Counsel proceeded to quote the sections of the act under which defendants were charged, and referred to "Storey *v.* the Chilworth Gunpowder Company" and "Wood *v.* Burgess," two cases that had been decided in a superior court, as bearing some interpretation of the act that was of value in the present case. The defendants Kearley & Tonge were tea blenders, and they supplied tea in packets to a large number of retailers. The tea in question (packets produced) was described on the label as being from a "Blackmoor Vale Estate." On the upper surface of the label were the words "imported by Kearley & Tonge" followed by "Pure Ceylon Tea." By paying close attention to the label, and perhaps with the aid of glasses, the words "Blended with India and China" might be discovered, but they were so hidden by a signature of "Kearley & Tonge," one flourish being scrawled heavily through them, that the words denoting a blend were certain to escape the eye of the purchaser. The packets in Court were bought of Mr. Westover, a grocer, and the tea had been analysed by professional men of the highest standing in London, who said that it was not Ceylon tea at all. If there was any Ceylon tea in the packets it was so small a part of the whole as to be undiscoverable. If that could be proved to the satisfaction of the magistrate, the question was whether the description upon the packets was a false description within the act, and whether that description was false in a material respect and such a false description as the Act was passed to prevent. It seemed to him (Mr. Gray) that that was clearly so. On the face of it, it was indicative, when they looked at the label on the packet, of the fact that the tea was the pure Ceylon tea. For while the words "Pure Ceylon Tea" were in large clear type, the words denoting that the tea was a blend were not only in very small type, but were practically scored out. This was indicative of a design to deceive, for the latter words were quite imperceptible to the ordinary purchaser. What was the impression on the mind of a person who asked for Ceylon

tea? He would get one of those packets given to him, and the question was whether he ought not to suppose, from the visible description on the label, that he was buying pure Ceylon tea, unless he was actually told at the time that the tea was a blend. When the word "pure" was used with the word "Ceylon" in important-looking letters across the front of the label, he (counsel) would submit that the sellers were not entitled by means of words tucked away and concealed to be exonerated from blame if they sold a blend to the purchaser. When it was considered that the description on the label was not the effect of accident but of design, he felt that a conviction was bound to follow. He would point out that it was not a question of infringing the trade mark of anybody; that was an altogether different charge. The analysts and professional experts to whom the tea had been submitted would pronounce it to be composed principally of Indian tea, with very little China, and hardly any, if any, Ceylon.

Mr. SKIRROW was then called and examined by Mr. Gray. He said he was a traveller for a firm called the Ceylon Tea Growers, Limited. On 24th May he had purchased packets of tea at Westover's shop in Lewisham High Street. He had sealed four packets in the presence of a witness; the packets were all closed when bought. He then took two packets to Mr. Leake, Secretary of the Ceylon Association; one he handed to his witness, and the fourth he retained.

Mr. WM. MARTIN LEAKE, examined by Mr. Gray, said he was the Secretary of the Ceylon Association in London. He had received, some time after May 24th, some packets of tea from the previous witness; and samples of that tea were handed by him to the experts for testing.

Mr. GEORGE STEHN was then called, and said that he was manager of Messrs. Wilson, Smithett & Company's tea rooms at 41 Mincing Lane. In answer to Mr. Gray he said his experience extended over 13 years. On 27th May Mr. Leake brought a packet of tea to his place of business, and gave him some of it. He submitted it to the usual tests and tasted it. He found it to be a blend principally composed of Indian tea, with a little China. It was possible that there might be some Ceylon in it, but if so it was very little. He had been to Ceylon.

Mr. GRAY:—Do you know of the existence of a Blackmoor Vale Estate in Ceylon?

WITNESS:—There is no such estate there.

Mr. ASQUITH:—We don't pretend that there is.

IN CROSS-EXAMINATION witness said that more than a tea-spoonful of tea was used in testing. Asked as to the method of testing, witness explained that it was done in the usual way—by pouring boiling water on the leaves and tasting the liquor, and by smelling the leaves both before and after infusion.

Mr. ASQUITH:—But do not Ceylon and Indian teas belong to the same class or family?

WITNESS:—They have marked characteristics of their own. There is a great difference in flavour.

Mr. ASQUITH:—That is strange. Are you sure of it? Yes; you wouldn't think it strange for there to be a difference between the flavours of a glass of sherry and a glass of port.

Mr. ASQUITH:—Do you mean to say that there is as much difference between Ceylon and Indian teas as between sherry and port?

Yes; the difference would be as apparent to a practical tea-taster.

Continuing, witness said that the price of the lower grades of Ceylon tea was about 2d higher than that of the corresponding grades of Indian in the market. It was one of the lower grades of Indian tea that had been used in the packets in question. The flavour of China tea was very different from either Ceylon or Indian. Pressed for his view as to the actual proportion of Ceylon tea in the packet, witness said that it might be as high as 5 per cent; but in his opinion there was not so much.

Mr. ROBERT ANDERSON was examined by Mr. Gray, and said that he was manager of the Indian and Ceylon tea department of Messrs. Arthur Capel & Company. Mr. Leake came to him on the previous day with a packet of tea, some of which he gave him. Witness turned it out and weighed it up, and then submitted it to the usual test and tasted it. His opinion was that the tea was mostly Indian with a little China. He could not find the least trace of Ceylon in it. He was engaged in tasting tea every day, and he might say almost every hour of the day. His taste would naturally become acute with so much practice.

BY MR. ASQUITH.—There was no difficulty whatever in distinguishing between Indian and Ceylon teas. He would certainly be able to detect the presence of Ceylon in the mixture unless the quantity used was quite insignificant. There was China in it—an appreciable dash; but no appreciable quantity of Ceylon.

GEORGE WESTOVER was called and examined by Mr. Gray. He said he carried on business as a grocer at 247 Lewisham High Street, and remembered Mr. Skirrow calling on 24th May and buying some tea.

Mr. LICKFOLD here asked the Magistrate to caution the witness not to say anything that would incriminate himself. There was a summons hanging over him, and it would not be right to allow the witness to prejudice his case.

After a short consultation the summons against Westover was withdrawn, Mr. Marsham remarking that he should be unable to compel him to answer questions in the witness-box unless that course was adopted. (Examination continued.) Asked where he obtained the tea in question, witness refused to answer the question, but ultimately said he got it from Kearley & Tonge. He went personally to their place for it; sometimes he brought the goods away with him. The teas complained of were sent down to him, however. The order was given at the firm's house, and the terms were cash; the money being paid at the time when the order was given. He had no credit for tea. The price paid was 1s 5d per lb., and he sold it at 1s 10d. The carriage of the tea was paid by Kearley & Tonge.

MR. GRAY:—Do you sell it as Ceylon tea or as a blend?—I sell it as a blend.

BY MR. ASQUITH.—He bought it at the office in Mitre Square in the city of London, and paid for it there. It was delivered to him in Greenwich at 1s 5d. Asked, "Did Mr. Skirrow ask for Ceylon tea?" witness said he was not in the shop at the time, but there were other witnesses present who could give evidence on that point.

Mr. ASQUITH, addressing the magistrate, said that the sale having taken place at Mitre Square, the offence, if any, was not committed within the jurisdiction of the court. He should be very sorry if this was so, because he felt that it would be much more satisfactory to have the matter disposed of by a learned magistrate than by an alderman of the City; and in this he was sure he expressed the sentiments of his learned friend as well as his own. But his only fear was that if a conviction was obtained it would not stand.

Mr. GRAY contended that the sale did not take place outside the jurisdiction of the court. The goods were sent in defendants' own van, and the sale was not completed until the tea was delivered at Greenwich, the price paid including delivery.

Mr. MARSHAM supported this view, remarking that he thought Mr. Asquith would not deny that if the tea had been damaged in transit Westover would have had a claim upon the defendants.

Mr. ASQUITH admitted that there was some force in the argument, and said that as the magistrate held that he had jurisdiction, he would gladly proceed with the merits of the case. He contended that the label on the packets was not a false trade description. It truly described the contents of the packets. No one was entitled to expect from the description that there was any large and appreciable quantity of Ceylon tea in the blend.

Mr. MARSHAM (interposing):—Well, one would expect that the *majority* was Ceylon, would he not?

COUNSEL, continuing, said that the experts had declared that there was no difficulty in deciding the proportion of Ceylon in the packets. It seemed another instance of the unreliability of expert evidence. He intended to shew by the books of the defendants and by evidence that there was a very

large proportion of Ceylou tea in the blend. His clients never bought China tea.

Mr. Marsham:—Then why do they say on this packet that it is "blended with India and China"? (Loud laughter.)

Mr. Asquith:—I shall come to that later on. Proceeding: Counsel said the tea was really a mixture of Ceylon and Indian. Of course, the quantity of Ceylon used varied from time to time. But it was always as much as 40 per cent of the whole and sometimes rose to 80 per cent. Ceylon and Indian teas did not differ so much as one of the witnesses had stated. The first named was used to give greater body to the blend, and to suit the palate of the consumer. In the tea before the court the Ceylon preponderated. The experts had differed somewhat from each other. In fact on one point their evidence was irreconcilable, for while one said that he could discover no Ceylon tea at all, the other had admitted that there was perhaps as much as 5 per cent. But assuming that he (Mr. Asquith) could establish that what he had stated about the contents of the package were the facts, where was the false description? Counsel for the prosecution had somewhat exaggerated the difference in the size of the letters on the label. Ceylon tea was a recent introduction which had attracted public attention; his clients would not deny this, and they naturally had the more attractive name printed in rather prominent type. It had been said that the signature of the defendants was made to hide the words signifying a blend. But he could prove that the signature was really the usual one adopted by defendants, and that the flourishes were genuine. Gentlemen in the city were often fond of adorning their names with long strokes and curls (laughter), and this was one of that kind. Now as to the words "Blackmoor Vale Estate": it was never intended that they should be understood as implying that the tea was grown on an estate of that name. Everybody knew that Blackmoor Vale was a charming spot in Wiltshire, famous for hunting. No one ought to be better aware of this than the gentlemen interested in that case, whom he suspected of a weakness for sport of that nature. (Laughter.) The words "Blackmoor Vale Estate" were registered as a trade mark by defendants before the Act was passed, and he could prove this by producing the certificate. It was purely a fancy description; and although he would admit that it was a rather eccentric form of trade mark, he denied that it warranted any assumption of fraudulent intentions. He would proceed to call his witnesses.

At this point Mr. Marsham said that it would be impossible to finish the case in the time at their disposal, and it was adjourned for further hearing on Saturday, 28th June, at 12 o'clock.

On Saturday, 28th June, at Greenwich Police Court, Kearley & Tonge, Tea Merchants, again appeared before Mr. Marsham in answer to a summons under the Merchandise Marks Act charging them with having sold certain tea to which a false trade description had been applied. It will be remembered that the case was partly heard last week and was then adjourned.

Mr. Gray again appeared to prosecute, and Mr. Asquith, Q.C., for the defence.

Mr. Hudson Kearley was called and examined by Mr. Asquith. He said he was a partner in the defendants' firm, who dealt largely in Ceylon and Indian teas. Ceylon tea was introduced into the English market about five years ago. That was the first time that any considerable quantity of Ceylon tea came to this country, and his firm began to deal in it at once. They had a label designed and made bearing the words "Pure Ceylon Tea," but without any reference to its being a blend. The signature running across the label was an exact facsimile of the signature of the firm signed by himself, and the flourish to which attention had been called was a customary part of that signature.

Mr. Marsham:—Was the flourish usually made so far away from the name as it is on this label?

Witness:—Yes; I can prove it by producing some of the firm's cheques (cheques handed to the Magistrate.)

Mr. Marsham remarked that the flourish was not quite the same as that on the label, where it extended farther beyond the name than it did on the cheques.

Witness explained this by saying that when the plates for the labels were engraved the signature contained also the name of a Mr. Heseltine. On his leaving the firm his name was erased from the plate, but the flourish remained unaltered. The signature was on the label at the time when it was used for pure Ceylon tea and nothing else. Referring again to the commencement of his firm's dealings in Ceylon tea, witness said that in course of time they came to the conclusion that it was coming down in reputation and in quality, and they formed the opinion that it would be improved in flavour by blending. They therefore mixed with it Indian tea, and had words added to the label signifying that the tea was a blend. The only difference between the original and the later labels was the addition of the words "Blended with India and China." The tea had always since that time been Indian and Ceylon, and the firm had never sold tea with that label attached of which Ceylon did not form a part. Although the label said "India and China," China tea had never been used in the blend. The word "China" had been added to the new label with a view to putting China tea into the packets if it should ever sufficiently improve in quality and rise in public estimation. But that eventuality had not yet happened. In evidence of this, witness quoted statistics showing that although the quantities of Indian and Ceylon teas imported had largely increased, the imports of China tea had gone on steadily diminishing.

Mr. Marsham said he wondered that the defendants should have put the word "China" on the label if they did not fully intend to put China tea into the blend.

Witness explained that they had not used China because Indian had always been better value in the market. He had not personally taken any part in the actual blending since 1888; prior to that year he had supervised it. Asked for his view as to the market difference in the prices of Indian and Ceylon tea, witness said it was nothing like twopence per pound in favour of the latter. Such a statement was simply ridiculous. The prices varied from time to time according to the issue of the market governed by supply and demand. For instance, if the Ceylon crop were inferior, it would have the effect of making Indian tea dearer in the market. Prices were constantly fluctuating and were not steadily in favour of either Indian or Ceylon. There was always a see-saw movement. To say that prices were always in favour of Ceylon tea was altogether untrue; in fact, until quite recently the very reverse had been the case, the average prices of Indian tea being above the average prices of Ceylon. At that moment, however, the relative prices were in favour of the latter; this having been so for some weeks past.

Mr. Gray, interposing, said it was not claimed by the expert Mr. Stehn that there was a uniform difference of 2d per lb. between all Ceylon and Indian teas; he had stated that this difference existed only between the low grades.

Mr. Asquith thought not; but on reference being made to the notes of the evidence given at the previous hearing, Mr. Gray was found to be correct.

Continuing, witness said his firm also sold tea under the "Ceylindo" brand.

Cross-examined by Mr. Gray, witness stated that the "Blackmoor Vale Estate" label was registered in 1886. That might be the year in which the Indian and Colonial Exhibition was held in London, but he did not know. Pressed on the point, he said he supposed there had been such an exhibition about that time; it was no concern of his to try to recall the exact date. The signature was on the label when sent for registration, but it had to be taken off because the authorities refused to register signatures. Defendants had used no China tea in the "Blackmoor Vale" blends. They rarely bought China tea: probably once in three months. But it was never used in blends of which Ceylon tea formed a part, only in cheap blends sold at about 10½ per lb. He had examined tea similar to that in

the packets in dispute and would assert that it contained not less than 40 per cent of Ceylon. As a matter of fact the whole of the tea was Ceylon sometimes; the proportion depended altogether upon the state of the market, The firm did not only study prices in buying tea: their object was always to give good value in the packets, and to accomplish this they always made careful comparisons of the real values of the tea they purchased for blending. Of course it was the natural tendency for the percentage of Ceylon tea to run down if the price rose.

Mr. Gray:—Now, supposing that there is 40 per cent of Ceylon in the packets: do you think that the label, as it is arranged, is a correct description of the contents?

Witness:—Certainly.

Mr. Gray:—Do you suggest that a person buying a packet like the one before the magistrate, after seeing the label, gets what he expects?

Witness:—I decline to suggest anything to the magistrate.

Mr. Gray:—I am asking for your opinion. If you asked in a shop for coffee.

Witness (interrupting):—We don't deal in coffee.

Mr. Gray:—I am not supposing that you do. But if you privately purchased what you believed to be coffee, and found that only 40 per cent was coffee, the remainder being chicory, would you be satisfied with your purchase?

Witness:—I have told you that I know nothing about coffee; I cannot say.

Asked what date the tea in question left defendant's warehouse, Witness could not say precisely, but it would be after May 1st, because the tea duty was reduced from that date and a small label was attached to the packet produced notifying that the price was reduced in consequence. As to the brand "Blackmoor Vale Estate," that was simply a fancy name. He refused to say whether the words printed on the label did not imply that the tea was actually grown on an estate called "Blackmoor Vale."

Pressed by Mr. Gray to say what the words were intended to imply when they put on the packet, Witness asserted, with some warmth, that they were intended to imply nothing at all. He repeated that "Blackmoor Vale Estate" was purely a fancy name. Asked if he thought that the ordinary purchaser would consider it to be so, he answered in the affirmative.

Mr. Gray:—Then you think that the old lady who goes into the shop for a packet of tea would suppose that the name of an estate printed on the package had no connection with its contents?

Witness:—My experience of old ladies has been that they think more about the interior than the exterior (Laughter.) The tea was sold on its merits, and those who bought it did so because it had a reputation.

Mr. Gray said it seemed to him that as the proportions of the ingredients were constantly varying, the reputation could not always be the same.

Witness replied that the value of the blend never varied although the proportion of Ceylon did. It was putting the case rather unpleasantly to suggest that when the label was made defendants intended to use China tea if it would pay them to do so. They intended to use it if it improved sufficiently to justify them in making the change. Witness would admit that no China had ever been used, although the label with "China" upon it had been in use for three years. He did not know when "Ceylindo" tea had been first blended. The certificate of registration would show, but it had not been brought to the court. Pressed as to whether it was not the fact that the "Ceylindo" brand was adopted in consequence of a warning letter from the Ceylon Association, witness denied any knowledge of such a letter. He did not know even of the Association's existence at that time.

Mr. Gray proposed to read a copy of Mr. Leake's letter to defendants, but Mr. Asquith objected.

Continuing, Witness said that the "Ceylindo" blend had been used for about 18 months. It was composed of Indian and Ceylon teas only. He was not prepared to admit that "Ceylindo" and "Blackmoor Vale" were practically the same tea. The latter was not, by a great deal, the most largely-sold blend; in fact "Ceylindo" had completely eclipsed all other brands sold by defendants. The "Ceylindo" label did not give any prominence to the word "Ceylon;" the brand having been introduced because the trade at that time were becoming rather doubtful of Ceylon tea. He admitted that the firm had a great many retail shops of their own. The shops of the "International Tea Company" belonged to them, and they also owned the shops carried on under the name of "Hull & King." The name was as well-known as St. Paul's Churchyard. (Laughter.)

Mr. Gray:—You have half-a-dozen shops under that name, I believe?

Witness:—You are only about sixteen short. (Laughter.)

Mr. Gray:—Now, to go to another point, you say on your "Blackmoor Vale Estate" label, "Imported by Kearley & Tonge." Is that correct?

Witness:—No; we do not actually import the tea. But it is a very usual thing in the trade, and in all trades, to use that expression.

Pressed by counsel as to what meaning the words were intended to convey when they were put on the label, witness said that they were intended to convey no meaning at all. He certainly could not justify their use under the circumstances. The label so printed three years ago was still in use.

Counsel here produced a large show-bill, bearing a brightly coloured picture representing a tea estate, surmounted by the words "Blackmoor Vale Estate." Witness did not think the show-bill implied that the picture was a representation of the estate where "Blackmoor Vale" tea was grown and packed; it was merely an attractive form of advertisement. His firm did not buy their teas at public sales; they bought them from other people who did buy at public sales on commission.

Mr. Gray:—Then the importation is two removes away?

Witness:—I have already admitted that we did not import the tea.

Mr. Gray:—You heard the evidence of the experts last Saturday?

Witness:—I heard the evidence of the so-called experts.

Mr. Gray:—Never mind that; we call them experts.

Continuing, witness said he had no independent experts to give evidence rebutting the testimony of Mr. Stehn and Mr. Anderson. But he had in court the actual mixer of the teas and the person who had given him instructions as to the proportions to be used. He did not agree with the witnesses who had said that it was possible, and easy, to distinguish between Indian and Ceylon teas. It was very difficult; often Ceylon tea was so "Assamy" that the most experienced men could not decide whether it was Ceylon or Indian. To say that the two growths were as distinct in flavour as port and sherry was absurd.

Mr. Gray:—Then if Ceylon tea were wrongly catalogued as Indian the buyers would be unable to tell the difference?

Witness:—Sometimes not. (Laughter).

Mr. Asquith, re-examining witness, produced certain contract-notes giving particulars of teas bought by the defendants.

Mr. Gray said that these particulars gave no information as to the proportions used in the packets in question; and Mr. Marsham shared this view.

Witness proceeded to state that between January and May in the present year his firm had bought about 100,000 pounds of Ceylon tea and 150,000 pounds of Indian.

Mr. Gray again remarked that this was not material evidence; the magistrate concurring, and pointing out that evidence as to the quantities of tea purchased was no proof of what the tea was in the packets.

In answer to Mr. Asquith witness asserted that there was no ground whatever for the suggestion that "Ceylindo" was adopted under a threat of prosecution by the Ceylon Association.

Mr. THOMAS LILLICOE, examined by Mr. Asquith, said he was the buyer and blender of teas for defendants.

Cross-examined by Mr. GRAY he said that he kept a record of the proportions of each kind of tea used in blending. A small pocket-book was produced from which witness proceeded to read figures to show that the proportion of Ceylon tea used in the "Blackmoor Vale" packets had varied from 40 to 80 per cent. Sometimes 100 per cent had been used. There was never any China in the blend.

Addressing the magistrate, counsel for the prosecution said that the book produced was perfectly unintelligible.

In answer to further questions witness said that all the tea was mixed on the firm's premises by men in their employ. He was not present when the tea was mixed; but he gave instructions as to what was to be done. The change in the proportions from time to time was caused by the rise and fall of the market. He had not thought it necessary to do more than make an entry when any change was made.

Mr. GRAY remarked that only the months had been put in the book for the dates when alterations were made; the day of the month had not been entered.

WITNESS went on to say that the firm had never kept any record of the actual quantities of the different teas used from time to time; only the proportions being made a note of. Those entries were made at the time when the blends were altered.

FREDK. SHARPE was called and examined by Mr. Asquith. He said it was his duty to receive the teas to be blended, and to superintend the putting of them into the mixture. He had to weigh them up; about 2,000 lb. would be blended at one time. His instructions came from Mr. Lillicoe in writing; he had not brought any specimens of these to the court. After the instructions had been carried out, he had to return the written papers to Mr. Lillicoe, accompanied by a sample of the tea. Witness had been engaged in the same workshop for about two years; he knew the blend called "Blackmore Vale." During the whole time he had superintended the mixing of that tea, there had always been used, as one of the ingredients, a substantial proportion of Ceylon, varying from time to time. He did not superintend the putting of the tea into the packets; the system was that the packers should come to him and ask for the particular teas they were required to pack, and they were given to them. There had never been any China tea in "Blackmoor Vale Estate" blend; the only ingredients were Indian and Ceylon. In answer to Mr. Gray, witness said he always got written instructions from Lillicoe, and these instructions were always handed back to him when they were carried out. Mr. Gray, addressing the magistrate, said he would call for the production of those instructions. Witness said it was not the practice to keep the instructions when done with; they were destroyed. Mr. Gray submitted that there was no documentary evidence whatever as to the quantities of the different teas used in the blends for the packets before the court.

Mr. MARSHAM:—That may be, but it can't be helped. He says the papers were destroyed.

Mr. R. O. HEARSON, examined by Mr. Gray, said he was a label designer and had designed the label for the packets in question. (Plates produced.) Mr. Kearley wrote the signature on the label; the name of Mr. Heseltine was formerly also on the label, but it was afterwards removed. Instructions as to the wording of the label were given him by Mr. Kearley; the design was witness's own. When the words "blended with India and China" had to be added, witness was told to add them without altering the character of the label.

Mr. ASQUITH, addressing the magistrate, said he did not know what better proof could have been given that the tea was a pretty equal mixture of Ceylon and Indian, than that which the witnesses for the defence had brought. It had been shown that the tea was bought by Kearley & Tonge, and actually delivered in the chests into their warehouse. Then one witness had said that he himself took the tea out of those chests and superintended the mixing of the various kinds according to instructions given by Mr. Lillicoe. What else remained? The tea was put into bags with a label attached to each, and the bags were taken by the men whose duty it was to pack the tea for the grocers, and they made it up into little packets like those in court. These being the facts he did not see what more proof could be given. He did not know what other evidence could be required. No instance had been produced in the evidence in which less than 50 per cent of Ceylon tea had entered into the "Blackmoor Vale blend." Of course, an accident might happen in the packing; but he thought that there was no reason why all the packets should not be alike. As to the signature, he would remind them that the flourish was exactly the same on the labels before the words about the tea being a blend were added, and therefore at that time the flourish could not have been used for the purpose of fraud. It had struck him, when he first saw the label, that the sentence "blended with India and China" was printed in very small letters as compared with the words "Pure Ceylon Tea." But he had gone very minutely into the label. He would point out that if the words in small type had been printed so in the first instance the case would be different. The defendants, however, were dealing with an existing label, in which a great deal of artistic talent had been displayed, and they had to adapt the label to altered circumstances. They did what was natural, they took as much room as they could for the words relating to the blending. That accounted for the difference in the size of the type used. It had been said that the words "Blackmoor Vale Estate" added to the falsity of the description. Now, it was well-known that Blackmoor Vale was a place in England, and nobody ought to suppose that the tea in the packets came from an estate in Ceylon of that name. It had been admitted that no China tea had been used; but he thought it would be stretching the Act very considerably if it was held that the defendants were blameable for not depreciating the quality of the tea by putting in a growth of a lower quality and price.

Mr. GRAY rose to reply, but Mr. MARSHAM said that he need not do so unless he had anything of importance to explain.

In giving the judgment Mr. MARSHAM said that after the evidence he did not think he could hold that the flourish of the signature was extended with an intention to obscure the small words about the tea being blended. But it was certainly true that the words "blended with" were not visible to the ordinary purchaser, and of the other words—"India and China"—one was admitted to be falsely used. Considering, in addition to this, that the words "Pure Ceylon Tea" were printed very prominently across the label, he thought that the label was deceptive. The charge of false description was proved, and he would impose a fine of £10, allowing £5 5s costs.

The case created considerable interest in Court.

CASTOR OIL.—We are indebted to a planting correspondent for a correction in the quotations we give monthly in our *Tropical Agriculturist.* He writes:—

"In your June number I noticed that castor oil was quoted at 3d to 4d per oz.; it struck me then as incorrect, but I now see the same statement made in the new publication about aloe and ramie fibres. This rate surely means per lb., as castor oil can be bought at 1·50 per gallon, which would equal ·01 cent per oz!"

We have had "lb." substituted for "ounces" at once in our list. In a recent Nuwara Eliya Report, Mr. LeMesurier speaks of the castor oil plant as growing at Walapane like a weed and he is anxious to encourage the natives in regular cultivation more especially as one Colombo firm is prepared to take 400 gallons of the oil per month—no doubt for lubricating purposes?

THE MADRAS GOVERNMENT BOTANIST ON CINCHONA CULTURE.

To neither the Madras Government nor Mr. Lawson its botanist and quinologist, are we, as yet, indebted for a courtesy which might very well have been expected, in the shape of a copy of Mr. Lawson's Report on Cinchona Culture in the Wynaad. Baron Rosenberg, however, indicated its chief points, in the letter we published, and now we find the report substantially quoted in the *Madras Times*. We see no reason to alter our opinion that the Madras quinologist attaches too much importance to "food starvation" as he calls the supposed effect of the absence of humus or its deficiency, and too little to the mechanical condition of the soil. We long ago discovered in Ceylon that in stiff clayey soil, largely impregnated with iron,—soil in which tea flourishes,—cinchonas cannot be grown. Also that soil rich in humus, but water-logged, was equally fatal to the fever plants. But we have had no confirmation of the principle which Mr. Lawson so positively propounds, that "what kills coffee kills cinchona." Although cinchona is of the same natural order with coffee, it has never been attacked by, far less has it died from, the effects of *Hemileia vastatrix.* The trees have grown together side by side in the same field; and while the coffee has been debilitated to death by repeated attacks of the fungus, the cinchonas have never suffered from this cause.

Now that the price received for ordinary bark scarcely pays gathering and sending to market, it seems like mockery to be told that the more manure used the better, and to be advised to resort to costly cross-trenches mulched with hill grass. The latter is said to be collected at small expense. But in the days when mana grass was used largely for cinchona nurseries in Ceylon, and the grass had to be conveyed any distance, we know that the cost was not small but very serious. Recommendations to manure and till liberally; to plant widely; not to take bark until the trees are six years old, and subsequently to harvest only at intervals of three years, are no doubt excellent in theory. But practically the question is will such cultivation pay, now, or at any period in this nineteenth century.

THE CEYLON AMERICAN TEA COMPANY.

We are by no means favourably-disposed to the proposal made by Messrs. Wattson & Farr for the re-organisation of this Company. If the enormous proportion of shares required for themselves really mean a return for very large expenditure, they ought for the sake of their good name at this end, among people not accustomed to American ways of doing business, to be much fuller and more explicit in their explanation of how they proposed to spend the money in order to secure the floating of the New Company and its profitable support over all the States of the Union. But at the same time we most fully recognise the difficulty in which the local Directors of the existing Company were placed. What is there, for instance—according to the law of the United States—to hinder Messrs. Wattson & Farr starting their own "Ceylon-American Tea Company" any day they please, free of the encumbrance of paying back (as they offer to do) the capital in the existing Company? There is no power at this end to provent their trading with the name of "Ceylon" or "Ceylon planters" in the States, and it would seem wise therefore not to cast them off, but to make the best of the responsibility attaching to a Company working in co-operation with a local Directorate. A planting shareholder who takes this view and who criticises a contemporary's utterances, writes as follows:—

July 18th.—I do think the local "Times" leader on the Ceylon American Tea Co. Ltd., as given on the 12th, in good taste, and is it not very misleading? Of the 6 000 shares of the original Co. only 1,747 are subscribed for, leaving 4,253. To buy those and assist in the formation of the New Company, looks to me very like buying R2 for R1. For every share held at present by stockowners, the New Company will allot 2 shares of \$20 each or \$40 = to say R108. So the present holder of a R50 share will get in the New Company's stock worth R108, for each share, or he has the option if he prefers it (read last paragraph in Wattson & Farr's letter) of retiring from the concern and receiving from them the R50 he has paid. They say—"We personally agreeing that if the new Company is undertaken, we will take up any shares of parties who may now be stockholders should they not wish to accept the proposal." Surely this is good enough; at any rate I shall stick to my stock, and think it worth while just putting a trifle more in. Your contemporary further says something about exigencies of trade compelling the new Company whose name is registered, to sell other than Ceylon teas. But the writer forgets it is a Company to be formed "*strictly* for the representation of Ceylon Industries." (See Wattson & Farr's letter last para but 2.) And to watch this, there will be the Board on this side.

The 28,000 shares to be handed over for *getting up the Company and for advertising, travelling* &c., &c. (see Wattson & Farr's letter) only mean £112,233. And what is this for an American Boom! especially if as the local "Times" editor says, it is "*to register the Company in every State in the merican Union*"? At any rate it may be said that "the £112,233" are not to come from Ceylon, but from the countrymen of Messrs. Wattson & Farr who are generally credited with remarkable acuteness about their investments. We suppose the prospectus of the new Company will be laid for approval before the Ceylon Directors, and clearly there must be a better guarantee for this new Association dealing in pure Ceylon produce under the joint arrangement, than if Messrs Wattson & Farr established a tea business of their own without reference to the existing Company.

DAVIDSON'S SIROCCO.—Can any of your readers tell me how a steady heat is kept up on a Davidson's large size Down-Draft Sirocco Tea Dryer. I find that the temperature drops from 385 deg. to 210 deg. before it hits the tea on the lowest tray. I also find that it takes 5 maunds dry wood too each maund of tea, that it does not turn out anything like 2 maunds per hour. Each one of these points contradicts Davidson's advertisement. Can anyone with practical experience tell me how to remedy them? A Darjeelingite. *P. S.*—I do not find that it puts price on tea, it only enables you to dry with other material than charcoal.—*Indian Planters' Gazette*, July 1st.

RAKWANA, July 12th.—Gemming operations are not progressing in such a satisfactory manner as was expected, and Mr. Baddeley does not seem to be at all satisfied with his Sinhalese laborers. To tell the truth, tempted by the liberal wages offered by Europeans, several persons of questionable character with no knowledge whatever of gemming took up work under the Gemming Syndicate. Mr. Harding of the Gemming Syndicate is expected here tomorrow. The plumbago mine on Barra is paying very well. Recently a sapphire weighing 19 carats was found by one Adonis Perera either on Spring Vale or Know Hill Estate in Kukulu Korle. The finder, not knowing the value of the gem, sold it to a Sinhalese boutique-keeper for R350. The later, who has a good knowledge of gems, had an offer of R1,900 for it; but he declined to part with it, and expects a much larger sum.—*Cor.*, local "Times,"

Correspondence.

To the Editor.

BARON VON ROSENBERG ON MR. LAWSON'S THEORY OF CANKER IN CINCHONAS IN INDIA:

Practical Experiences and Advice.

Tulliar, Devicolum, June 6th.

Sir,—Some time ago Mr. Lawson was asked to report on the canker and general decay of cinchona trees in the Wynaad. A good many of your readers must be interested in this question, I trust therefore you will find space in your columns to insert these few lines.

I have now seen Mr. Lawson's report, and from a planter's point of view it is not in any way satisfactory.

It is short, it is not very much to the point, it certainly seems misinformed in its premises, and illogical in its deductions. To us this would matter little, we could content ourselves with saying "Mr. Lawson is wrong;" certainly "we have learnt little from Mr. Lawson."

But there are planters who may be opening out cinchona estates, or taking them over from others; or agents, who, knowing little about planting, may insist upon taking Mr. Lawson's report as gospel, having the policy he advocates carried out. For the sake of these a note of warning should be sounded. Mr. Lawson's first conclusion is that cinchona estates are not sufficiently worked. Granted! But who is to blame for this: not the producer in this, that, or the other district, but the large cinchona-producing community all the world over. The prices obtainable for produce are so low, that estates cannot be thoroughly worked.

And it is here, at the very outset, that Mr. Lawson tumbles into his first error. He says that in former times, when the product paid better, it was right that cinchona trees should be planted close; well it is just because prices are so low, that now only close planting pays. If we planted wide apart, how many lb. per acre should we get off clearings under 15 to 20 years old? how could we make those few lb. per acre pay at a minimum profit?

Again Mr. Lawson insists upon the necessity of preserving the soil. Very well indeed! But how can the soil be better preserved than by covering it as soon as possible, *i. e.* by close planting and thinning out afterwards if necessary? But where Mr. Lawson is surely entirely mistaken, is when he ascribes the canker in the Wynaad to poverty of soil only. If Ooty were unknown to Mr. Lawson, if he had not seen the Government and other plantations there, thriving in soil so poor, under circumstances so wretched, one might forgive him. But as it is the arrogance of the statement is delicious. He virtually seems to say: "You in your Wynaad lands which are rich enough to have supported magnificent forests, and undeniably fine coffee, are not on a par with us the children of the higher mist whose lands never supported anything but scrubby grass and stunted rhododendrons; for lo and behold, with us cinchona thrives, with you it dies, therefore (i. a. a.) we have soil, you have none!

Mr. Lawson deigns not to go into the varieties of canker or diseases so named or misnamed. He contents himself with insinuating that those foolish old men, who imagined a specific disease, were utterly mistaken. There is none. Manure your plants sufficiently, and they 'll grow equally well on the top rock of Dodabetta, yea down unto the quay of Calicut.

Mr. Lawson goes on to inform us, the ill-informed, that coffee and cinchona belong to the same species. He deduces therefrom that they thrive under like conditions only. Let him plant a coffee bush on the windblown steeps of Dodabetta, or a cinchona tree in the club compound of Madras, and they 'll thrive as much as a Lapp would in the Sahara or Ramaswamy on Mount Hecla. And yet Lapp and Ramaswamy belong to the same or forked radish species. And though it be true that both coffee and cinchona belong to the cinchonaceae they differ in most particulars, such as flower, seed, quality of bark. And chiefly they differ in the purposes for which we grow them, for we do want coffee to flower and seed, we object to it in cinchona.

To sum up, I am positive that they cannot and do not necessarily thrive in the same soils and localities.

And to these generalities I will add from my own observation. I am now living on an estate at from 4-5,000 ft. elevation, on which both cinchona and coffee have been largely planted. Well, a few years ago, there was among them a magnificent field of cinchona *var. condaminea.* Some 4 years ago canker showed in a few patches, and these were planted up with coffee. The canker is now spreading, has indeed assumed alarming proportions, and it has been decided to plant up the whole field with coffee. And why? Because in the soil which according to Mr. Lawson must be too poor to support its equal feeder cinchona, it thrives remarkably.

Again, to take the reverse of the picture. Cinchona (a strong grown hybrid) was planted among young coffee, it shared all the manuring of the coffee, it was planted fairly far apart, it had every advantage that Mr. Lawson claims for it, yet it died; the coffee died not, but is flourishing.

Again, there is a small bit of cinchona here (mostly Condaminea), planted in a landslip, *i. e.* land entirely denuded of its topsoil, and which has been considerably neglected, yet the plant seems thriving.

Let us take another estate next to the foregoing. This was felled and planted up with cinchona, Ledger and Hybrids. The soil is remarkably rich, and good pits were made, yet now in its fifth year there is hardly a stick left standing. I thas since been, and is being planted up with coffee, and the coffee is remarkably vigorous.

And now let me turn to another side of the district, a few mile s away, a few hundred feet higher. There cinchona, though closely planted, is perfection, such as probably Mr. Lawson has never seen. It has gone out in a patch here and there, but the rest after 10 years and several croppings looks perfectly healthy, and this in spite of the fact, that in one two places that I know of, it was not even pitted for, but only dibbled in. And there cinchona even now pays, but it would not pay, if it required cultivation, beyond weeding, and perhaps an occasional surface digging.

Mr. Lawson's report in fact comes to this, he says: the patient is sick because he is starving as for any sickness, he cannot discover it, and therefore cannot diagnose it. There is no harm in the latter: we may be as unable to give the diagnosis as Mr. Lawson is, but we will eat our hats, and planters' hats are proverbial, if actual disease does not exist or if it is due to want of food material chiefly or only.

Cinchona does thrive in poor soils, as far as absence of canker is concerned—poor at all events in *humus*, viz. on the Pulney Hills or even on

Mr. Lawson's own Dodabetta. That there may be *mineral* ingredients sufficient in these soils is not denied, but analysis of the Wynaad soils shows no lack of these mineral ingredients either.

One of our overseers, who has been at planting for many years, takes the very opposite view to Mr. Lawson and says "canker is due to richness and not proverty of soil." I am not inclined to go all the way with him in this statement, but I think he is nearer the truth than Mr. Lawson. Why else is there so little canker in cinchona planted in sterile grassland, such as that of Liddlesdale, Belleview and other estates at Neduwattam, and Ooty? Very much to the point is a clearing near here, at Devicolum, where a patch of grassland cinchona adjoins, and is under the same conditions in every way, as a plantation in felled forest land. The latter has suffered from canker here and there, the former not at all. And here I would call Mr. Lawson's attention to a fact he is either ignorant of, or has ignored. I mean the fact, that there are certain jungle trees, the dead roots of which will kill out tea, coffee, and especially cinchona. Perhaps this is the explanation of patches among otherwise healthy cinchona, planted in forest land, and their non-appearance in grassland.

I would also add that for the actual growth of the cinchonas, and for the analyses of their barks, a rich soil, either naturally so, or produced artificially, is no doubt preferable, but these questions are wholly apart from that of canker.

After all this denial of Mr. Lawson's theory on canker, you will expect me to pronounce a theory of my own, yet I must own, that I hardly have one, and every planter worthy of the name will approve me, when I say that all theories on the subject are and can at present be mere guesswork, or at the best an honest attempt at deducing from visible facts. Such, however, as my opinions, on the subject are I will give them, and your readers must take them for what they may be worth. It is then my belief that there are three diseases that attack cinchona and can prove deadly to it, call them canker, or anything else you like:—

1stly, a disease which begins at the top of the tree, sometimes at the end of the branches in the shape of a withering and drying up of the leaves and younger wood. I would ascribe this to not enough sun; in some clearings to a windy aspect. This rarely, hardly ever proves fatal.

Secondly, there is the disease which attacks the roots of the tree, sometimes working from the feeders upwards, sometimes from the collar downwards. This is always fatal in the former case. In the latter, if the evil be perceived before the whole of the collar is affected, a cutting away of the affected part which outside has a red or black, inside a rotten white appearance, may save the tree, at all events for a time. This disease I attribute to a clayey subsoil, a lack of drainage in the sub or surface soil or, to the effect that wind has had on the plants when young, bending them to and fro, and thus hardening "ultra fas" the tissue at the point of resistance, *i. e.* the collar.

Thirdly, there is the disease, which attacks any part of the stem from the collar to the second or even third set of primaries. This is a sort of desiccation of the bark in parts, followed by a congestion in others. We planters, in perhaps unscientific, but very expressive language, say this is due to the plant being hidebound. Taken at an early stage, and other circumstances being favourable, it can sometimes be remedied by running a knife up the stem, thus liberating the flow of sap. But circumstances as a rule are not favourable, when this species of disease sets in, and I would, from my experience, attribute by far the greater proportion of the mortality among cinchona in India, at all events, to the latter form of canker. That it is due to a stoppage of the flow of sap, is proved by the fact, that exudation sometimes sets in below, or beside the part affected, and that principally at the times of year, when sap rises abundantly.

I would attribute this disease to drought principally, such drought as is general in India during January, February and March. It stands to reason that it is far worse at low elevations where the heat is greater, and high and intensely dry winds usually prevail during these months.

At such lower elevations the desiccation of the bark is more or less universal (though less felt in sheltered parts) the cambium is so "hidebound" by the shrunk bark, that it cannot pass the rising sap: hence the latter exudes or is dried up in the bark. "Pas de sang pas de vie," and the tree dies. At higher elevations this form of canker is rare; when it does appear, as a rule it only desiccates the outer bark, and is therefore often remedied by above process of running a knife up the stem.

Even at lower elevations, I have kept a clearing of cinchona alive for a year or two, when suffering from this disease, by ripping up the bark on both sides of every tree. Not that I expected those trees to live indefinitely, that I knew was hopeless, but because I hoped to and did get a crop of renewed bark. Such then is my theory, faulty no doubt, but the result of past and present observation and experience of my own, and my brother planters in this district, which must, in its lower elevations, resemble other districts, among them the Wynaad.

As for the cinchona planters of the latter district, I have no message of hope for them. I would not, as I may have seemed to argue, advise their planting up their grasslands with cinchona, but on the other hand, I cannot advise their planting up their forest land or trying to keep up their present clearings, at all events those parts affected by canker.

Mr. Lawson argues from the fact, that there are still enormous cinchona trees in the Wynaad, and tries to deduce therefrom that thousands of other giants may yet be reared. But Mr. Lawson's premises must be statistically strengthened before we can accept them. Those giant cinchonas are probably the result of the survival of the fittest, both as to plant and locality. They were probably planted with others, and the others died. And so in the future, only with larger numbers the *others* will die, and some few remain. Beyond all this, however, there is a circumstance, which Mr. Lawson has not even touched upon. I mean the possible, nay the certain deterioration in the seed, from which present plantations have been reared, as opposed to that, from which the older plantations have grown up.

Those old giants of the Wynaad and elsewhere are no doubt the result of seed, either imported direct, or taken from trees not barked. This, unfortunately, has not been the case with seed used for most of the later plantations, which has, as a rule, been taken from trees previously weakened by cropping, and that too of the old stripping kind.

In proof of this I will only mention, that a few years since when there was such a scramble for Ledgeriana, seed was sold, stated to be off trees giving from 7 to 14 per cent sulphate of quinine, *i. e.* not only must the parent trees have been barked, but the analysis must even have been obtained at least after the second barking from renewed bark. Let this vitiated seed be put among circumstances somewhat adverse and disease will immediately fasten on the plant nor will the latter have strength to rally. Put it among healthy circumstances, and, like a puny child well cared for, it *may* pull through.

In conclusion, my advice to cinchona planters in this Presidency and probably Ceylon also, is: Do not plant cinchona of any kind below 5,000 feet. If needs you must plant cinchona, go up, up, up, and plant some good hybrid.

Do not try and preserve your cinchona, if you see it going out from stem or root canker, at a lower elevation, it would merely be throwing good money after bad. And even if you tried to, and succeeded in preserving it for some few years, by the expensive means advocated, look at your accounts, and see whether present and near future prices will reimburse you for such cultivation.

For all this I am simply giving my opinion for what it may be worth, and for the sake of the Wynaad planters I sincerely hope I may be wrong. Even for my own sake and the cinchona I still have at lower elevations, I shall be glad if my opinion is refuted.

Finally, hard as I may seem to have been on Mr. Lawson in my statements, it is not for my own benefit that I express them. It is for the sake of my afflicted brother (cinchona) planters, that I have written. I therefore trust Mr. Lawson will not take my remarks amiss, and if he cares to come up here and, if possible, change his opinion he will find us not bad hosts, and growers of A1 cinchona.

I am also very willing to admit that Mr. Lawson's advice, in other directions than those touched upon, is excellent. But a better market must rule before we can carry it out.—I am, sir, yours faithfully,

J. v. ROSENBERG.

TEA IN CEYLON.

DEAR SIR,—You are not quite accurate in your leading article of the 20th inst. under the heading "The Earliest References to Tea in this Island" and you do Bennett an injustice when you say, his botanical blundering was speedily exposed." Bennett says (p.p. 276-7.) "The late Asst. Staff Surgeon Crawford in 1826 sent him from Batticaloa a very fine specimen of what *Crawford* considered the real tea, it fully answered the generic description of *Thea Bohea* of Linnæus, and he gives a colored plate of the sketch he took of it, and *then adds* "but I was altogether unsuccessful in my own researches for the plant in the jungles of Mahagampattoo." Percival (1805) pp. 330-1 says the tea plant was found native in the forests and growing spontaneously in the neighbourhood of Trincomalee: He further says the soldiers of the garrison sundried the leaves and boiled them and many preferred the decoction to coffee! &c., &c. On the other hand Cordiner (1807) says (p. 285.) "The real tea tree is not indigenous in Ceylon, but the island produces several species of that genus," &c., &c.

E. B. CREASY.

[We are obliged to our correspondent for his interesting notes, but we scarcely think we have done Bennett an injustice, for in publishing the plate he took the responsibility attaching to the belief that the true tea plant had been found growing wild in Ceylon. This will we think be seen from a perusal of the full passage in Bennett. He ought to have taken steps to verify Dr. Crawford's supposed "find," before he lent his authority to the statement that the tea plant existed in Ceylon.

(*From "Bennett's Ceylon and its Capabilities."*)

The jungles adjoining this place, and throughout the Mahagampattoo district, abound with the "wild tea tree," as it is called, but which, I am informed, is a species of *Orchis*. It bears yellow flowers; and the poorest people are accustomed to use the leaf both for food and drink; for the former, boiled and mixed with *Tyre*, and for the latter, an infusion of the green leaf. It is called *Gal-Kuroo* by the Sinhalese; who also employ the leaf of another plant, which greatly resembles that of the *Thea Bohea*, L., and is called by them *Rata-The-Kola*, (or Red-Tea leaf,) in a similar manner.

Although the infusion of the green leaf is a very bitter drink, it is an excellent tonic, and its taste may be greatly improved by the addition of the indigenous lemon grass (*Andropogon Schœnanthus*, L.) and sugar; but that made with the dried leaf, is a tolerable subs itute for Bohea tea.

The late Assistant Staff Surgeon Crawford, at the time he superintended the hospital duties at Batticaloa, in 1826, sent me, by a native *Dhoney* bound to Hambantota, a collection of insects and plants; and among the latter, a very fine specimen of what he considered the real tea, in flower. It fully answered the generic description of the *Thea Bohea* of Linnæus; and, as it both flowered and seeded freely, I made a sketch of it, of which an engraving is annexed. but I was altogether unsuccessful in my own researches for the plant in the jungles of the Mahagampattoo.

Mr. Crawford did not assume any merit to himself as having made a new discovery, and it is very clear that the Dutch were well aware of the tea plant being indigenous in the eastern province; but it is to be wondered at, that the Government has not, long ere this, directed its attention to so important an object of commerce; for if it be worth while to cultivate tea in so distant a country as Assam, with all its inconveniencies and dangers, surely it would be a more lucrative speculation, in a colony so much nearer home, and with increased facilities of export. But this, like the bread fruit tree, is another *chance* discovery; and a better acquaintance with Ceylon in 1787-1789, would have rendered the two expensive trips to Otaheite, for supplying the West Indies with bread fruit plants, inexpedient; for they could have been obtained in any quantity from this island, and have obviated all the disastrous consequences of the mutiny on board His Majesty's ship "Bounty."

Captain Percival, in his "Account of Ceylon," published in 1805, informs us, "that the tea plant has also been discovered native in the forests of the island. It grows spontaneously in the neighbourhood of Trincomalé, and other northern parts of Ceylon. General Champagné informed me that the soldiers of the garrison frequently use it. They cut the branches and twigs, and hang them in the sun to dry; they then take off the leaves, and boil them to extract the juice, which has all the properties of that of the China leaf. I have in my pocket a letter from an officer in the 80th regiment, in which he states that he had found the real tea plant, in the woods of Ceylon, of a quality equal to any that ever grew in China, and that it was in his power to point out to Government the means of cultivating it in a proper manner."
—ED. *T. A.*]

JUTE MESH FOR WITHERING TEA.

Ivies, Yatiyantota, June 25th.

SIR,—Referring to your note attached to my letter *re* Jute Mesh for withering I wish to say that the coarse sample sent you is that of the cloth that the Calcutta firm say the Indian tea estates have been using for some time for withering. It weighs 16 ounces per yard and would cost 17 to 18 cents. I do not think it suitable for *withering* tats, though it might be useful for drying wet leaf or for covering reeper floors; but I hope that *Jute Twist Mesh* weighing 10 to 12 ounces will be found to be as strong and cheap and consequently superior for this, the purpose for which I intended *it*.

The fine sample sent you is one of those I had made in England, but I consider it rather too light for withering tats. If it were made as described in my previous letter under the name of *Jute Hessian Mesh* I think it would be about equal in weight and strength to the hessian now used; and I see no reason why it should be dearer out of proportion to its weight.

I am awaiting further information from Calcutta, which I shall be glad to send you when received.—Yours truly, E. F. DAVIS.

[We shall be glad to hear further.—Ed. *T. A.*]

THE BEGINNINGS OF TEA IN CEYLON.

Central Province, June 26th.

Dear Sir,—In a late leading article reviewing the names of earlier shippers of tea you have entirely omited the names of Messrs. Saunders, Mercers and Scovells. Yet Blackwater and Adam's Peak should not be forgotten. Blackwater tea is older than most Ambagamuwa tea. Blackwater, Strathellie and Galboda are about contemporaneous, with a call in favor of Blackwater, I think.

Adam's Peak averaged a fraction over 1s 5d all round—and all tea shipped but red leaf—in 1883.

A portion of Mariawatte was planted from Blackwater seed. None of the gentlemen, proprietors, or superintendents, connected with the estates I have mentioned are, as far as I know, expecting testimonials from the public. Nor does Mr. Armstrong. Do not Mr. Jas. Taylor's proprietors reward him as he deserves? If not, why not?—Yours truly, M. D.

[We are obliged to "M. D." for his corrections —which have just come in time for the last sheets of *the* book—but not for his snarl about the Loole Condura testimonial. Does he mean to place any of the names he mentions on the same footing as the pioneer of the "Sixties" and "Seventies" in cinchona as well as tea?—Ed. *T. A.*]

TEA PARCHMENT *V.* TEA LEAD.

Sir,—Can tea planters any longer afford to give away expensive boxes and lead linings? We sell tea, not wood and lead, and it is quite time a fixed charge was made for packages, at least as much as the dealers can sell them for. What power is there in the trade to enforce this customer? If no other power, let the growers themselves make the necessary stand. Again, why continue to se expensive lead for lining our chests, when farch eaper and equally efficient substitutes are avilable?

In the face of the profits and commsisions that are made on lead by importers and agents, the planter has much to contend against in his efforts to make this change, or changes of any kind, but surely as a body, moving as one man, much could be effected. I have seen a returned lining of parchment in which the tea went home and kept perfectly sound and sweet. Where then is the obstruction to its general adoption seeing that the cost is about one-half?—Yours faithfully,

TEA PLANTER.

TEA PACKED WITH PREPARED PAPER IN PLACE OF TEA LEAD.

London, June 27th.

Dear Sir,—I have pleasure to inform you that the break of Elkadua tea sent home in the prepared tea paper has met with every success.

The break, as I think I mentioned to you when in Ceylon, was divided in two,—½ being packed in paper, the other in the ordinary lead. The result of sale was precisely similar, each break fetching exactly the same figure viz. 10¾d (pekoe).

The trade has made no objection whatever to the paper, and as it will cost about 40 per cent less than the lead, there does not appear to be much doubt as to its ultimate success.

I have recently had an application for samples from the Kangra Valley Planters' Association along with other Indian concerns.

I have today written the Chairman of your Planters' Association and sent him further samples at his request.

I propose substituting this paper entirely for tea lead on the Elkadua estate, where we have close 1,000 acres of tea, and where the saving will of course be very considerable.—Yours truly,

J. MAITLAND-KIRWAN.

A QUESTION FOR ROSE CULTIVATORS.

Kandy, July 1st.

Dear Sir,—I shall be glad if you can tell me if it were ever known before that the rose could be propagated from the leaf. I have tried this mode of cultivation and have found it eminently successful—indeed leaves seem to strike more surely than slips.—Yours faithfully, J. DUNBAR JONKLAAS.

IGUANA SKIN FOR SHOE LEATHER IN CEYLON: WHAT ABOUT OUR CROCODILES?

Jaffna, July 2nd.

Dear Sir,—Perhaps you are not aware that the skin of the iguana is made into shoes, though not extensively, in Jaffna. I saw a pair of child's shoes made of its leather, and was struck with its novelty and the ingenuity of the local shoemakers, who, in Jaffna, are invariably Moormen. It is evident from this that one use of it at least is known to the natives of this province, and that they cannot be quite strangers to the mode of dressing the skin, if such nice soft shoes as those I saw could be made out of the local preparation. I trust your remarks will commend this industry to the authorities, and this poverty-stricken, though industrious, people will have another means of earning a subsistence when such means are not many and where nature has been niggardly in bestowing her benefits.—Yours truly, A STRANGER.

MINERALS IN CEYLON; BERUWALA.

Anuradhapura, July 12th.

Dear Sir,—Your editorial note in the *Observer* of the 8th instant headed "Mineralogical" calls to my mind certain passages on the same head occurring in the works of two Ceylon authors which do not ever appear to have been sufficiently regarded, if at all.* I enclose them herewith, as they may be of some interest, even if of no value. I also enclose a short notice of a historical event which happened at Barbareen, Barbaryn or Beruwala, which place is briefly referred to in your issue of the 10th instant.—Yours truly, in haste. C.

Bennett's Ceylon, published 1843.—Extract (chap. xli, p. 331):—"The late Mr. Reckerman, Fiscal of Colombo, informed me that coal had been discovered in the island by the Dutch; but from there being such an abundance of wood, and charcoal the only fuel used by the native cooks, no notice whatever was taken of the discovery that mineral is now become an object of such great and general importance, as to be worthy of the most particular research, for the purpose of supplying fuel to steam-vessels, touching at Ceylon, on their voyages to and from Madras, Bengal, and the Red Sea, and would be one of the greatest acquisitions to the colony that discovery has ever produced."

[For the argument that neither ordinary coal nor anthracite exist in Ceylon, see monograph on plumbago in transactions of local Asiatic Society.—Ed. *T. A.*]

* They have often been carefully examined and disposed of. See our notes to passages quoted.—Ed. *T. A.*

Percival's Ceylon, published 1803 and 1805, Extract, chap. xvi, p. 357 (1803 edition):—"There were several mines of quick silver wrought by the Dutch in Ceylon. In 1797 Colonel Robertson found out one at Cotta about six miles from Columbo. The quantity we procured from it did not exceed six pounds but it afforded a most useful and seasonable supply to the garrison, as at that particular time all we had was exhausted, and mercury was the principal remedy resorted to in all liver complaints.

"Although some quicksilver was still procured from this mine, yet the labour and expense attending it was so great, owing to the want of experienced and skilful workmen that it was judged proper to give up working it altogether before I left the island. I have since been informed that the undertaking has been resumed at the same place with more success."

[See the paper already referred to.—ED. *T. A.*]

Percival's Ceylon.—Extract, chap. vi, pp. 129, 130:—Six miles onward from Calturalies Barbareen, a small village, with a sort of harbour formed by a projection of land where the river runs into the sea. This is almost the only place when the high surf and rocky shore on this coast permits shipboats of the European construction to land.

This place was signalized by a shocking catastrophe which took place here in 1795. A boat from his Majesty's ship "Orpheus" having been sent in here to procure fresh provisions, the sailors, confiding in the peace which then subsisted between the British and Dutch Governments, came ashore without any apprehension, and began to look out for water, a few fowls and vegetables. They were at first received with much apparent civility, and many promises that they should be plentifully supplied with the articles they required. This, however was only intended to amuse them, while a party of Malays stole unperceived between them and the boat, and fell upon them unexpectedly. Few of our men escaped this shocking treachery which was a-piece with the jealous and barbarous policy usually practised by the Dutch towards strangers who approach their colonies. The Malays who were the instruments of their cruelty on this occasion, were afterwards in dread of its being revenged upon them when our troops came before Columbo. Indeed it was a fortunate thing for them that the town was taken by capitulation as our men were very much exasperated against them both on this account, and their repeated attempts to surprise our camp before Trincomalie and Columbo.

[A different and, we suspect, a more truthful account of the Malays than that given by the same writer in his account of the massacre of the British troops at Kandy.—ED. *T. A.*]

At Barbareen there is a principal manufactory for making cordage and cables from the cocoanut tree. Large quantities are sent from hence to Columbo and Point de Galle, to supply the vessels which trade to these Ports.

GREEN TEAS: PATENT PREPARATION OF, IN CEYLON.

DEAR SIR,—Some particulars of our invention which renders the manufacture of true green teas simple and inexpensive may be of use to your readers. We have, as you are aware, patented the method as well as the machine in Ceylon, and hope shortly to do so in India. Our patent covers, 1. A method of rendering tea leaf pliable for purposes of rolling or twisting without resort to the process known as withering.

2. A machine for carrying out this method on a scale large enough to suit the largest factories. Green teas may be divided into two class s Oolongs or semi-green teas which are partially fermented, and true green teas which are wholly unfermented. These teas are the most popular class of tea in use in North America as shown by the fact reported to the inventors by Mr. F. Street, the local tea expert, that out of a total export of 51,000 000 lb. of China tea to the United States last season up to the middle of November only a very little over 1,000,000 lb. of tea corresponding to the ordinary Ceylon black leaf was imported, while of Oolongs there were imported 14,000,000 lb., and of the unfermented class which are the true green teas no less than 32,000,000 lb.

In view of the desire in Ceylon to introduce teas of this island into the American maket, it is thus shown to be highly desirable that teas should be manufactured of the unfermented class, and that a method and apparatus for insuring the manufacture thereof should be perfected.

OOLONGS consist of tea leaves withered either artificially or naturally by hot air or on hot plates, sufficiently to enable them to be rolled, when they are straightway fired.

The result of this process is that the effect called by some fermentation and by others oxidization is partially produced, and this effect prevents the leaves from being uniform in colour and causes them to vary from an olive green to a light brown.

TRUE GREEN TEAS are made only of leaf which has never been fermented or oxidized and when infused should show a uniform yellowish green colour which could never be obtained had either oxidization or fermentation taken place. The production of these teas has hitherto been found impracticable in Ceylon because leaf could not be rendered sufficiently soft or pliable to be rolled or twisted unless by its being withered either naturally or artificially by hot air or hot plates, which withering is in itself a degree of fermentation or oxidization.

It was therefore requisite to find a method of obtaining pliability necessary for the rolling or twisting process by other means which would prevent all fermentation or oxdization. The inventors claim to have discovered after long experiment, and to have been the first in Ceylon to practise their discovery, that leaf could be without resort to any process heretofore used in Ceylon causing fermentation or oxidization, be rendered sufficiently pliable for rolling by a method here-to fore entirely novel in Ceylon, which process not only produces pliability but absolutely checks all fermentation or oxidization. Full particulars of the machine can be obtained from Messrs. Brown, Rae, & Co., our agents at Hatton, and with each machine, instructions necessary for its use will be issued.

(Singed) H. D. DEANE,
J. T. RAE.

RAMIE MACHINERY EXHIBITION.—Another exhibition of ramie preparing machinery is to be held in the Agricultural Section of the Paris Universal Exhibition in August next.—*Industries*, June 14th.

TILE DRAINAGE.—Prof. J. F. W. Johnston, of Edinburgh, has said in his lectures on agricultural chemistry that "with the disappearance of the permanent state of moisture, the *coldness* of many soils also rapidly disappears. The backwardness of the crops in spring and the lateness of the harvests in autumn are le s frequently complained of, for the drainage in many localities produces effects which are *equivalent to a change of climate*." He says further that "in consequence of the drainage which had taken place in the parish of Peterhead, Aberdeenshire, during the previous twenty years the crops were arriving at maturity ten to fourteen days sooner than they formerly did, and that the same was true in many other localties."—*Louisiana Planter and Sugar Manufacturer*, June 28th.

SEED PEARLS IN BORNEO.—From an official report we quote as follows:—"The Seed-pearl fisheries at Tetabuan and Lingkabo are in a more than flourishing condition, the Bajows tell me there is no fear of the present crop being worked out under two years. good worker can make a dollar a day.

"KEW BULLETIN."—The June number, now before us, contains an article on compressed or tablet tea, dealing with the methods of its manufacture at Hankow, and at Chungking in Thibet. Thibet trees of the Straits Settlements form the subject of another paper. It contains much useful information on a great number of different species, giving the weight of a certain number of cubic inches, and of a cubic foot of each and native names of the trees. Cotton in West Africa forms the subject of another paper.—*Gardeners' Chronicle*, June 14th.

VARIETIES OF TEA.—In a lecture on Tea before the Society of Arts, Mr. Richard Bannister has the following:—

The youngest leaves made the best teas, and starting from the end of the shoot, and numbering the leaves as they came from *a* to *f*, the following varieties would be obtained:—*a*, flowery pekoe; *b*, orange pekoe; *c*, pekoe ("poco" means "white hair" or down of tender leaves); *d*, first souchong; *e*, second souchong ("souchong" means "small plant"); *f*, Congou (means "labour," expressing the care required in preparation); *a b c*, Mixed Pekoe; *a b c d e*, mixed pekoe, souchong. Hyson means "before rain," or "flourishing spring;" Kyson skins, refuse of tea (native term "tea skins"), coarser refuse (native term "tea bones.")

COFFEE ON THE BELLIGHERRY RUNGAN HILLS.—The high price realized for coffee last year (average of 103 to 108 shillings per cwt.) and the firmness of the market for the last two or three years, have induced speculators to invest more largely in coffee lands. Instead of buying up coffee estates of some standing, it is better to open out new coffee in new localities. "Bug," "leaf disease," and other pests make the upkeep of old properties more expensive than opening out fresh lands. We hear there are several applications for lands on the Belligherry Rungan Hills, Mysore Province, for coffee cultivation. At present a solitary planter—Mr. Morris—has opened out some 200 acres on these hills, but the search for fresh lands has induced several others to apply for blocks in this locality. We hear that Mr. Sanderson of Keddah fame purposes opening out coffee estates here.—*Bangalore Spectator.*

RUBBER CULTURE IN COLOMBIA.—A report by Mr. Wheeler, on the agriculture of Colombia, forwarded as a Consular report, by our Minister, and of the country, states—as we learn from a home journal—that various sorts of trees producing caoutchouc, mostly *castilloas*, are indigenous to Colombia, but only one sort is cultivated, and that, at present, to a very small extent. This is a hitherto undescribed species of the family of the *Euphorbiaceæ*, allied to the *Ceará* and the *Hevea* of Brazil, but it grows at greater elevation than any of the Brazilian species. In Chaparral there is a plantation of 70,000 trees, at 6,500 feet, which are doing well. They are ready for tapping in six years from the time of planting. This report lends additional interest to a communication which a M. P. Durand has recently made to the Paris Commercial Geography Society, in which he states that in April last he purchased 10,000 hectares (24,711 acres) of land at Monteria (Rio Sinu), Colombia, which is "incomparable" for cacao and rubber tree growing. He has since then planted a portion of the property with cuttings from the rubber trees in his neighbourhood, and hopes to hand over to his *société* in three years 100,000 young rubber trees which may be tapped from the sixth year.

A BUSY TEA FACTORY IN UVA.—It is not so long ago that some people thought that Uva would not be suitable for tea cultivation, but the experience of the last few years seems to show that as a tea-producing district it will be second to none. Nothing, for instance, can be finer than the tea on Glen Alpin estate, where as much as 400 and 500 lb. per acre is obtained off 4-year old tea, whilst the factory on that estate is turning out large quantities of tea. Up to date over 230,000 lb. of made tea has been turned out of it during the year, and by the 31st of this month, when the financial year closes, the total will have increased to 250,000 lb., of which a small proportion is bought leaf. We hear that a wire tramway 2½ miles long is about to be constructed from Badulla town to the estate, for the purpose of conveying manure from the town depot, where it is collected, to a point high up the estate, where it can be easily distributed. With a fine crop of coffee, with tea doing so splendidly, and with magnificent facilities for manuring, Glen Alpin ought to be a most valuable property for the shareholders of the Company.

"INDIAN CORN" is suggested by His Excellency the Governor as a product that ought to be freely cultivated in Ceylon, in his remarks to the people of Matale. This is a very natural thought to an Administrator who has seen how largely Indian corn forms the food of the people in the West Indies as it does in Brazil and other American States. And even in Ceylon, Sir Arthur Havelock will learn that maize or Indian corn is grown to a limited extent; and as we have repeated time after time in our "Agricultural Review" a great deal more should be done with it here in suitable localities. It requires however a moist good soil, although it has the widest range of all cereals. Bertolacci so far back as 1816 reported that "Turkish corn" or maize had been proved to succeed well in Ceylon: it was then grown freely in the Matara and Batticaloa districts and exported to other parts of the island. He hoped to see culture extend to the supersession of dry grain. There can be no doubt that much might be done in Ceylon to increase the production of maize, more particularly if better means of communication were established from Polgahawela and Dambulla, northwards and eastwards.

MINERALOGICAL.—Mr. George Armitage, to whom we referred the very pretty specimen of silver-like iron pyrites recently sent to us, in returning it states:—

"The bright faces are evidently the facets of the natural; crystal and judging from the angles, the crystal was I consider forming into a combination of the cube and tetrahedron, such as you will see figured in any good book on mineralogy."

A correspondent wrote to us:—

"No mention is made of *arsenic* in 'Gold, Gems, and Pearls.' I have been told that it exists in large quantities in parts of the island, and should be glad to know something about it as a marketable article."

On this head Mr. Armitage writes:—

"There is doubtless lots of arsenical pyrites in the island though I have not come across it. The ordinary pyrites does not contain arsenic. Arsenopyrite, mispickel, and arsenical pyrites which are different names for the same mineral, has a silver-white colour inclining to steel gray and is composed of arsenic, sulphur and iron with at times part of the iron replaced by cobalt. There are a lot of other minerals, such as sencopyrite, solingite, orpiment, realgar, &c., containing arsenic. I shall be glad to show anyone the specimen I have of arsenopyrites. It tarnishes outside, but shows the silver-white colour on a fresh fracture. Native arsenic is formed in veins in the crystalline rocks and often with ores of realgar, antimony, &c.

"*Re* your remarks about steatite in a recent *Observer*, it is I believe common in Ceylon. You sent me specimens to name on two occasions."

It seems doubtful if arsenic exists in a marketable form in Ceylon.

THE LAST CINNAMON SALES.

Cinnamon planters seem doomed to disappointment, not only through the absence of any material general improvement in the price of their spice, but especially in their efforts towards that end. The Chamber of Commerce in its last half-yearly Report, made pointed reference to this, as about the only native product which had not shared in the upward tendency which had been established with almost every other product. It was, however, hoped that a new experience was in early store for it, which would dawn with the next Quarterly Sales, which stood fixed for last Monday. The ground of the hope was the combination which Planters had entered into, to step the scraping of Chips; but so far has the hope been from realization that an actual fall in price has been registered. The experience is not dissimilar to that which puzzled producers when the initiation of more frequent sales was also followed by a fall in prices five or six years ago. The cause then was the combination of buyers in London to oppose every obstacle against proceedings which might imperil the monopoly which a few London Firms enjoy, of being the distributors to Europe and America of the finest kinds of Ceylon Cinnamon. The cause of the present disappointment is the continued failure to arrest production. Over-production being the very obvious cause of the fall in price of an article, the consumption of which cannot be stimulated by circumstances like those which operate with necessaries of life, the reasoning was that the cessation in the scraping of Chips, at least over a considerable area, would lead to a better demand for quilled bark, by reducing the total output. So far there has been no falling off in Exports. On the contrary, the current commercial year shows, up to last week, an actual increase in the quantity of bark shipped, both Quils and Chips' as compared with last year, while the diminution in the weight of Chips exported, as compared with the two previous years, has been compensated for by a material increase in Quills. The cause of low prices being thus yet in operation, it is not to be wondered at that the anticipated rise in price has not yet been realized. The following figures relating to the export of Cinnamon from 1st October to 20th February in the years named below, will explain how matters stand:—

Year.	Quills.	Chips.	Total.
1889-90	813,494	242,771	1,056,265
1888-89	929.296	242,771	749,153
1887-88	554,840	119,857	814,390
1886-87	701,127	259,550	1,045,444.

The foregoing table shows at a glance that the total Exports of Cinnamon during the current year are higher than in any of the three previous years, being 300,000lb. more than last year, and about 25,000lb. more than the year preceding. In the face of this it is unreasonable to expect a rise in price; but there is no reason to despair. True, the Chips shipped up to date this year are more than double the quantity for the corresponding period of last year, but the engagement not to scrap Chips had not full operation more than a quarter. Since then, as just before, the quickened demand for the article has led to all the available bark being rushed into the market. Not only cannot this be continued much longer with reference to the supply; but the ruling prices for Chips in London are a discouragement to the continuance of shipments thither at present local prices. Before many months elapse this will probably appear, there being further hope in the fact that, notwithstanding circumstances which have stimulated the output of Chips this year, the quantity of Quills shipped, far in excess of previous years, is more difficult of explanation. Probably, the season has been favourable for the harvesting of bark in some districts, and in others the necessities of growers, through low prices, have compelled them to cut all the bark they could; but it is to be feared there has been a gradual extension of the acreage under Cinnamon in village gardens. If this surmise be correct—in no other way can the large exports for years past be explained in the absence of new Estates—the fact shows with how small profits the Native grower can be content, and how difficult it is to compete with him in products which he can himself grow and prepare. We have often felt, and have to some extent experienced, how illusory are the projects which some benevolent people are fond of urging on others, of farming, fruit-growing &c. A scheme might look well enough on paper, but when account is taken of the fact that competition has to be faced with villagers to whom time is of no importance, who give their own spare labour, and who spend little or nothing on the upkeep of stock, buildings, &c., one should think twice before making small farming one's sole dependence.

The fall of ½d per lb. in low and medium kinds, referred to in the telegram received yesterday, added to the fall of ½d to 1d experienced at the November sales, will be seriously felt by producers of low-priced medium bark. The heavier fall of 1d to 2d in fine bark, following a similar fall in November, must be a great disappointment to those who began to think the taste for superior bark had been fairly established. But we must not forget that, at the November sales, an exceptionally large quantity was offered; and although the 2,000 Bales catalogued this week, of which 1500 were sold, are below the previous offerings, they represent a full catalogue for this time of the year. We await further particulars by Mail; but meanwhile counsel Planters to be firm to their engagement not to resort to Chips. Before two years, the period of probation, shall have expired, it may be possible to record a victory.—Local " Examiner."

CEYLON EXPORTS AND DISTRIBUTION 1890.

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1890 B'nch &Trunklb.	Tea. 1890 lb.	Cocoa. cwt.	Cardamoms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1890 cwt.	Coconut Oil. 1889 cwt.	Plumbago. 1890 cwt.
To United Kingdom	43594	100	43694	4442693	27693859	7193	105046	523042	150306	9060	57070	72459
" Marseilles	157	...	157	12500	547	79	...	45100	2800	...	...	...
" Barcelona	...	...	...	...	...	...	...	22000	...	...	...	...
" Genoa	12	...	12	...	1514	...	...	35725	11424	696	908	...
" Venice	71	232	303	70412	755	...	...	4000	11200	...	...	...
" Trieste	7825	...	7825	252	1130	...	...	3900	8848	3490	4611	...
" Odessa	32	...	32	...	15	...	...	...	...	99	2211	...
" Hamburg	296	...	296	...	30519	787	1131	146300	52772	9362	3707	22197
" Antwerp	17	20	37	81057	115	...	...	7000	5600	304	1492	9409
" Bremen	18	...	18	...	9559	151	...	14606	...	...	...	3632
" Havre	...	100	100	...	...	...	...	10000	...	...	4578	...
" Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
" Africa	16	...	16	...	18720	...	...	5000	...	...	...	...
" Mauritius and Eastward	174	212	368	...	25788	498	...	7500	...	35132	378	...
" India	725	718	1443	...	71863	...	87571	5000	...	43238	13346	171
" Australia & New Zealand	5639	869	6508	...	1204365	1	40	2260	...	1029	1737	242
" America	1794	...	1794	186764	105833	1389	2271	64228	...	15028	62726	80942
" Stockholm	...	...	.	...	173	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 31st July 1890	60373	2251	62624	4815062	29164755	10370	196059	895661	254150	117448		190668
Do 1889	42015	3799	45932	5173737	20037992	9873	165772	1362563	338555	152764		235068
Do 1888	91080	3793	94972	7244095	13483711	9790	172261	848984	360507	202314		146927
Do 1887	126195	5373	131626	7714748	7247190	13374	202802	586622	146836	128810		144920

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, 17th July 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White	Slightly softish to good hard bright	£7 a £8 15s
Yellow	Do. drossy & dark ditto...	95s a 115s
CINCHONA BARK—Crown per lb.	Renewed ...	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings ...	2d a 9d
	Branch ...	1d a 3d
Red	Renewed ...	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings ...	2d a 5d
	Branch ...	1d a 3d
	Twig ...	1d a 1½d
CARDAMOMS Malabar and Ceylon	Clipped, bold, bright, fine	1s 8d a 3s
	Middling, stalky & lean	10d a 1s 6d
Alleppee	Fair to fine plump clipped	1s 4d a 3s 4d
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, bgt.	1s 6d a 2s 8d
Long Ceylon	Middling to good...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill ...	7½d a 1s 7d
2nds	,, ,, ,, ,,	7d a 1s 4d
3rds	,, ,, ,, ,,	6d a 1s 2d
4ths	Woody and hard...	5½d a 11d
Chips	Fair to fine plant...	2½d a 7½d
COCOA, Ceylon ...	Bold to fine bold ...	105s a 113s
...	Medium ...	95s a 103s
	Triage to ordinary ...	60s a 90s
COFFEE Ceylon Plantation	Bold to fine bold colory...	104s a 110s
	Middling to fine mid. ...	101s a 103s
	Low mid. and Low grown	95s a 98s
	Smalls ...	94s a 97s 6d
Native	Good ordinary ...	92s a 98s
Liberian ...	Small to bold ...	85s a 93s
East Indian ...	Bold to fine bold...	104s a 115s
	Medium to fine ...	100s a 105s
	Small ...	93s a 98s
Native	Good to fine ordinary ...	92s a 99s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£15 5s a £28
Stuffing ...	Coarse to fine ...	£5 a £18
COIR YARN, Ceylon ...	Ordinary to superior ...	£13 a £30
Cochin ...	Ordinary to fine ...	£12 a £36
Do	Roping fair to good	£12 a £15
COLOMBO ROOT, sifted ...	Middling wormy to fine...	14s a 25s
CROTON SEEDS, sifted ...	Fair to fine fresh...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold...	50s a 69s
,,	Small and medium ...	26s 6d a 38s 6d
Rough	Fair to fine bold ...	21s a 28s
...	Small ...	14s a 19s
GUM ARABIC, Madras...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	9s a 11s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES Pale, ...	Good to fine picked ...	9s 6d a 10s 6d
	Common to middling ...	8s a 8s 9d
	Fair Coast... ...	8s 9d
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	⅝d a ¾d
LEMON GRASS ...	,, ,, ,,	1½d a 1¾d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	4⅝d a 5¼d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White ...	,, ,, ,,	1s 1½d a 1s 2½d
PLUMBAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright...	5s a 9s
RED WOOD ...	Fair and fine bold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to good flavor	£30 a £58
Do. chips ...	Inferior to fine ...	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	5d a 8d
	Fair middling medium...	2d a 4d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	15s a 17s
Do. ...	Mixed middling [bright	14s a 15s
Do. ...	Bulbs	10s a 12s
Cochin ...	Finger	10s a 11s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9 inch	16s a 23s
2nds	Foxy & reddish 5 a 8 ,,	13s a 18s
3rds	Lean & dry to middling under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Socotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	33s 6d a 36s
	Ordinary and middling...	30s a 33s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright ...	5⅞d a 6⅛d
	Common dull to fair ...	5¼d a 5⅝d
Stems...	Common to good ...	1¼d a 1⅜d
COCULUS INDICUS ...	Fair ...	8s 6d a 10s
GALLS, Bussorah & Turkey ⅌ cwt.	Fair to fine dark blue ...	52s 6d a 57s 6d
[cwt.	Good white and green...	40s a 50s
GUM AMMONIACUM per	Blocky to fine clean ...	20s a 50s
ANIMI, washed, ⅌ cwt.	Picked fine pale in sorts,	£12 a £13 10s
	part yellow and mixed	£8 a £11
	Bean & Pea size ditto ...	£5 a £8 10s
	amber and red bold ...	£8 a £11
scraped...	Medium & bold sorts ...	£4 a £7
ARABIC E.I. & Aden .. per cwt.	Sorts	32s a 75s
Ghatti ...	Sorts to fine pale ...	20s a 70s
Amrad cha	Good and fine pale ...	50s a 65s
	Reddish to pale brown ...	25s a 45s
ASSAFŒTIDA, per cwt.	Clean fair to fine ...	26s a 38s
	Slightly stony and foul...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 30s
MYRRH, picked ,,	Fair to fine pale ...	£5 a £6 10s
Aden sorts	Middling to good ...	72s 6d a 80s
OLIBANUM, drop per cwt.	Fair to fine white ...	35s a 55s
,,	Reddish to middling ...	25s a 34s
pickings...	Middling to good pale ...	12s a 20s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER Mozambique, per lb. Ball & Sausage	red hard ...	2s a 2s 6d
	white softish ...	1s 5d a 2s
	unripe root ...	1s a 1s 11d
	liver ...	1s 3d a 2s 3d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb	Nearly water white ...	4d a 4½d
2nds ,, ...	Fair and good pale ...	3⅝d a 3¾d
3rds ,, ...	Brown and brownish ...	3⅛d a 3¼d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 6d
	Common foul and mixed	9d a 1s 10d
Rangoon ...	Fair to good clean	2s a 2s 4d
Madagascar	Good to fine pinky & white	2s 4d a 3s
	Fair to good black ...	1s 11d a 2s 2d
SAFFLOWER ...	Good to fine pinky ...	60s a 70s
	Middling to fair ...	40s a 60s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	22s 6d a 24s 6d
,, ...	Common & middling soft	12s a 21s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb.	Middling to fine ...	2d a 3¼d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ⅌ cwt.	Good, pure, & dry white	160s
Japan ...	,, ,, pink	160s
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	38s a 41s
	Pressed	nominal
Block [per lb.	Good ...	27s 3d
GUTTA PERCHA, genuine	Fine clean Banj & Maca-[sar	3s 6d a 4s 6d
Sumatra...	Barky to fair	2s a 3s 4d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	1s 10d a 2s 9d
	Inferior and barky ...	1s 4d a 1s 9d
NUTMEGS, large, per lb...	57's a 80's, garbled ...	2s 10d a 4s
Medium ...	83's a 95's ...	2s 8d a 2s 9d
Small ...	100's a 160's ...	1s 6d a 2s 7½d
MACE, per lb. ...	Pale reddish to fine pale	2s 8d a 3s
	Ordinary to fair ...	2s 3d a 2s 6d
	Chips and dark ...	1s 6d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 2d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	9d a 1s 1d
	Dark, rough & middling	3d a 7d
SAGO, pearl, large, ⅌ cwt.	Fair to fine ...	17s a 18s
medium ...	,, ,, ,, ...	15s a 17s 6d
small ...	,, ,, ,, ...	10s 6d a 12s
Flour [per lb.	Good pinky to white ...	8s a 12s
TAPIOCA, Penang Flake	Fair to fine ...	2d a 2½d
Singapore ...	,, ,, ...	2d a 2½d
Flour ...	,, ...	10s a 15
Pearl ...	Bullet, per cwt. ...	21s a 22s
	Medium ,, ...	17s a 18s
	Seed ,, ...	16s a 17s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for August :—

PLANT FOOD AND ANIMAL FOOD.

It is a common error to suppose that chemical analysis, and this alone, is necessary for finding out the nature of manures to be applied to crops, and the nature of foods to be supplied to animals. It was one of the unfortunate results of the teaching of Liebig that agriculturists came to believe that when the composition of the ash of plants was ascertained, farming would be reduced to a simple equation :—Given the elements of the soil and the composition of the plant, required the manure. They now know, however, that there are other considerations to be taken into account in deciding what manure should be supplied to a crop. The leguminosæ, for instance, are found by analysis to be rich in nitrogen, and yet nitrogenous manures produce but little effect on leguminous crops: while, though the cereals are most benefited by nitrogenous manures, they contain less nitrogen than roots and leguminous crops. Thus the composition of the crop is not a sufficient guide to the character of the manure to be applied, even when the analysis of the soil on which it is grown is known. We require to know in addition the power of the crop to assimilate the ingredients of plant food.

In the same manner there are other considerations besides the chemical composition of the food supplied to animals which must influence our selection of food-stuffs. Just as the food ingredients of the plant may be present in the soil in a condition in which they cannot be made use of, so also may the nitrogenous and non-nitrogenous parts of food exist in a form in which little nutriment is derived from them by animals. For a long time all the nitrogen in the food of animals was supposed to be in the form of albuminoids; but during the last few years it has been shown that a part of the nitrogen of vegetable foods exists not as albuminoids, but as amides, and, in some cases, as nitrates. Thus it is quite possible that a food which was supposed to contain more albuminoids (reckoning all the nitrogen as albuminoids) than another, may turn out, when the true albuminoids only are taken into account, to be inferior in value. Having ascertained the amount of true albuminoids, we are able to find the "albuminoid ratio," that is the proportion of digestible albuminoids to digestible non-albuminoids in food. For the best feeding results a certain proportion between these two must be observed: and it will be readily admitted that to supply animals with an unlimited amount of food without considering the ratio of albuminoid matter to carbohydrates will not give us the best feeding results. The results of the analyses of vegetable foods are generally given under the heads of water, nitrogenous substances (the albuminoids being reckoned separately), fat, soluble carbohydrates, fibre, and ash. In calculating the albuminoid ratio the fat is reduced to its equivalent in starch by multiplying by 2·5, and the result is added to the soluble carbo-hydrates. The most important consideration in the matter of feeding, however, is the digestibility of foods, which can only be ascertained by experiment; and the general method adopted is to supply an animal with weighed quantities of food, the composition of which is known, collect and weigh the solid excrements and analyse them, and thus obtain almost the exact amount of

each constituent of the food which has passed through the animal unabsorbed, and by difference the amount digested. The proportion of each constituent digested for 100 parts is known as the "digestion co-efficient." There are some foods which, though chemical analysis proves, they have less of the valuable ingredients of food than others, are superior to these latter from the fact that they show a larger digestive co-efficient. For instance, linseed cake from the large proportion of fats and albuminoids which it contains would be expected to occupy a higher position as a heat-producing food than maize; its lower rank is due to its less perfect digestibility.

The necessary proportion of albuminoids to carbo-hydrates in the food of animals is analogous to the proportion of food ingredients necessary for the healthy growth of plants. Plants will not take up any more of an ingredient that is supplied to them in excess than they require in order to maintain the proportion to be observed between the amounts of the various elements of food. As different species of animals require different kinds of food, that is foods of different composition, so plants too require the ingredients of their food to be supplied in different proportions. Some take in more of one element of food than another; while some are able to attack substances in a little soluble form, as some animals have a greater power of assimilating little digestible parts of food.

There are yet many considerations to be taken into account, such as the influcnce of one element of food on another. The presence of an excess of water results in a certain amount of waste of the nitrogenous part of food; the addition of oil to a diet of fodder results in most cases in improved digestion; common salt hastens the conversion of starch into sugar. The digestion of vegetable fibre differs in different animals, and according to the source from which it is derived. Cattle and sheep have the greatest power from the fact of their being ruminants, horses and pigs come next, while poulty seem to have no power of digesting vegetable fibre. Flavour, too, has a great influence on diets; an agreeable flavour stimulates the appetite and promotes digestion. The reason for sowing a small quantity of yarrow with pasture grasses is no doubt this, and the fact of cattle greedily devouring bracken ferns and thistles after being made into silage that has acquired an agreeable flavour from fermentation, amply proves it. Even smell has some influence on appetite. The sweet smell of *anthroxanthrum odoratum* in hay is greatly appreciated by cattle, though the grass is not very palatable and by no means very nutritious; while the aversion of cattle for fodder contaminated by the excrements of their own species is evidently owing to the peculiar odour it has acquired.

Thus the feeding of animals with the best results must be looked upon as an art that requires the help of chemistry, and calls for a knowledge of the results of experiment and observation by no means limited. And it is the total ignorance, or utter neglect of the principles of feeding animals that are specially intended for drawing heavy loads, laying on beef, and secreting milk, that has brought the cattle of this country into the degenerate condition in which we find them.

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De. Silva.

Sapindaceae.

22. *Schleichera Trijuga* Wild; Sin. Kón.

This is a tree common in the warmer parts of the Island. It attains very large dimensions, but the special feature of a Kón tree is the dense mass of foliage which covers it. The stem is thick and has a hardy appearance, the bark being grooved as it were. The main branches are few, but the minor branches are many. The dense leaves of this tree are compound (pinnate), and the leaflets have entire margins with prominent veins: in general, the leaf may be said to have a desiccated appearance. The trees shed their leaves once a year, after which young leaves begin to spring up. The young leaves of the Kón tree are of a pink hue, whilst the ordinary ones are of the usual green colour. The fruits are borne once a year in large bunches containing hundreds of them. They are round and small, about the size of small marbles, and are covered with a rather brittle leathery pericarp of a dusty colour. The mesocarp is a succulent mass of pulp encircling the seed. This succulent mass is of a yellowish colour and contains an acid substance. When unripe it is very acid and also has a little astringent taste, whilst when fully ripe the astringency is replaced by a sweeter taste, and the acid character too disappears to a certain extent.

This pulp is much eaten when ripe, and where-ever the trees are met with, the fruits are not allowed to waste. In some places they become a marketable article where a hundred is sold for a few cents. The pulp of the Kón fruit is also made into curries and eaten along with rice, but this curry, though liked by some, is not to the taste of many on account of its acid nature. A palatable jam may also be prepared from the pulp of this fruit by boiling it in a syrup. A large quantity of oil is found in the seeds of *Schleichera*, and is extracted in some parts of the Island and used for burning. It is also said that a considerable quantity of lac is produced in the young branches.

The timber of this tree is known as the Ceylon oak. It is very durable as well as elastic, on account of the latter property the wood is in much demand for making native oil mills (chekkús), and for many other purposes as planks, beams, &c.

The medicinal properties of this plant unlike many other native plants are known to be of a definite nature, as the juice expressed from the leaves is always recommended for disorders of the brain, giddiness, biliousness, &c.

23. *Nephelium Longana* Cam.; Sin. Mora.

This tree very much resembles the one described before, but it does not appear to be of such a hardy character. The leaves are greener in appearance and the fruits are smaller. The epicarp or the outer covering of the fruit is leathery and smoother than that of the Kón. The mesocarp which surrounds the seed is of a blackish tint, and instead of its being sour as in the Kón, it is of a very sweet taste rather more than is pleasant. The fruits when ripe have a smell of ether. Bats are very fond of this fruit, and it is difficult to preserve them from their attacks. The fruit is eaten much and is in demand always. The seed is of a very black colour and light, and it

does not contain oily matter to any appreciable extent. The timber is also good, and is used for a variety of purposes especially in building.

The bark of this tree is used in cases of mild fever, and the fresh juice is reputed to be a successful remedy in curing earache.

OCCASIONAL NOTES.

We have before us Bulletin No. 6 of 1889-90 of the Agricultural Department, entitled "South Indian Fodders." This paper consists of a series of analyses of the chief kinds of straw on which the cattle of the Madras Presidency are fed, with explanatory remarks appended; and the work is that of Dr. VanGeyzel, M.B., C.M., F.C.S., F.I.C., Chemical Examiner, Madras. After giving the average composition of the straw of paddy (*Oryza sativa*), Cholum (*Sorghum Vulgare*), Ragi (*Eleusine corocana*), Cumbu (*Penicillaria Spicata*), Varagu (*Paspalum Scrobiculatum*) and, for the purpose of comparison, analyses of English and American wheat and oats, English Barley and American Maize, he remarks:—"The first point to observe is the apparently extraordinary poverty of the Indian straws in albuminoids. This brings down the "albuminoid ratio" in all cases to a figure much below that given for any English or American fodders. That this is misleading will, however, be evident, if the nitrogen found in the non-albuminoid compounds be calculated in the usual way into albuminoids, and the nutritive relation worked out on the result. The results are then, except in the solitary case of the analysis of oat straw where the non-albuminoid nitrogen is separately given, generally much more favourable to the quality of Indian fodders. In comparison with the English and American straws shown in the table, and judged by the figures representing the "albuminoid ratio" (*i.e.*, the total nitrogen being regarded as albuminoid); the South Indian fodders examined do not appear to be inferior; they also compare favorably in respect of the total amounts of nutriment contained in them, viz., the sum total of albuminoids, the starch, and the starch equivalent of fat, excluding the fibre, which is in this case usually regarded as non-assimilable. What proportion of the total nutriment is actually assimilable being unknown, it would be unsafe to condemn these fodders, though regarded absolutely as food in the light of their albuminoid ratios, the analysis show that these fodders, on which South Indian cattle mainly depend are not of high value. Of the fodders generally obtainable, ragi straw appears to be the best, while varagu and cumbu straw are but little inferior to paddy straw, and cholum straw is the worst."

So far back as 1869 we find Mr. Laurie, the Director of Public Instruction at that date, suggesting in his Special Report on the state of Public Instruction in Ceylon, that "an Agricultural class should be initiated in connection with each school," and recommending the appointment of "a Master of Design and Technical Science." The carrying out of the former project, however, was left to the energy and determination of our present Director, who, we doubt not, will not rest satisfied till he sees the latter suggestion also *un fait accompli.*

From the Director of Public Instruction's report we quote the following:—"There are now altogether eleven Schools of Agriculture in Ceylon; that is to say, there is the parent Colombo School of Agriculture, which I opened in 1884, and there are ten branch institutions officered by young men trained in the parent school, the object of which is to spread into the districts the knowledge hitherto confined to those who came in to Colombo to the parent school.

"In 1887, the first of their existence, there were only six branch schools. The progress is therefore satisfactory, especially when it is considered that the government continues to pay for only six Agricultural Instructors; but the Government Agents of the Eastern and North-Western Provinces, of Sabaragamuwa, and Kegalla have come forward, recognising the usefulness of my Agricultural Instructors, and have themselves arranged for the payment of the four new Agricultural Instructors, who are usually attached to ordinary Schools, giving a few hours of theoretical instruction each week during the School Session, and, with the help of the bigger boys and such labour as they may engage on hire, cultivating plots of land upon improved principles. The profits are divided into two halves. Half goes to the Instructor and the remaining half divided amongst the boys who work on the paddy-fields or highlands cultivated. These lands are re-rented and paid for, so that my Instructors may be in no better position than the native cultivator, excepting that they cultivate on improved principles. Otherwise the native cultivator would lay our success down to having free government land."

Mr. Dunstane, a well-known American Naturalist, has brought back from Central America some horrible details of the "la sagenas de diable," the devil's snare, a plant or vine composed entirely of bare, interlacing stems of a very dark hue and covered with a thick viscid gum that exudes from its pores. There are many stories current in the vicinity of Nicaragua lake, where the plant is found in the swamps of San Sebastian, of human victims to its voracity. These must be taken for what they are worth; but as to the carnivorous nature of the plants there seems little doubt, for Mr. Dunstane had this proved to his satisfaction by the attack made on his dog, and on his own hand, while attempting to rescue the animal. The meshes of the vine were found to twist and twine in a most life-like fashion whenever anything came within their grasp, and from experiments made with raw meat &c. it was found that whenever any animal matter came within reach, it was sucked dry of its blood in a few minutes and then thrown aside. The gummy secretion seems to serve the purpose of increasing adhesion and overpowering the victim by its nauseating odour.

We are in receipt of the annual report of the Department of Mines, New South Wales, for the year 1889—a voluminous Blue Book of 253 pages. From it we find that the number of applications dealt with in 1889 amounted to 4,155, of which 1,640 were for gold leases comprising an area of 13,768 acres, and 2,515 were for mineral leases covering an area of 160,700 acres. The number of appli

cations for leasing crown lands for mining purposes (including applications for special gold leases) for 1889 falls short of that for 1888, which, however, was quite an exceptional year. The minerals to be mined for comprise gold, silver, copper, lead, tin, antimony, cinnabar, iron, cobalt, bismuth, crome, ochre, plumbago, diamonds, coal, marble, slate, manganese, kerosine, and alum. The geological survey of the Colony is progressing rapidly under the two geological surveyors, Messrs. David and Anderson, and by their work not only are the hidden stores of coal and the wealth of minerals being reached, but a knowledge of the geological history and formation of the Colony is being gathered, while most useful palæontological work is being prosecuted under Mr. Etheridge.

The report of the Director of Botanical Gardens for 1889 was published in June, and the accounts of the Gardens at Peradeniya, Hakgala, Badulla, Henaratgoda and Anuradhapura show how much is being done by Dr. Trimen for the improvement of these places, and the highly satisfactory condition to which he has brought them. The foundation of a Museum in the Peradeniya Gardens will supply a long felt want; and already a good start has been made with a splendid collection of Ceylon woods. It is a great consideration that lovers of gardening are able to secure such plants as are available in the nursery at a very moderate price, but it is very desirable that some responsible person should be stationed at the lodge by the gateway, who can receive payments for plants purchased. As it is, the coolies who carry the plants are authorised to receive money, and it has happened on more than one occasion that they have disputed about prices which had been previously arranged, and endeavoured to extort more than the value of the plants. Neither these men nor the gatekeeper it appears can be commended for their civility to visitors, and this, as occurring in a public resort so largely frequented by foreigners, is a matter of regret, and calls for redress.

A caterpillar, said to cause serious damage to the coconut tree in Batticaloa, was sent to us with some affected leaves. The caterpillar appears to feed on the softer tissues of the coconut leaves which it rolls up into cylinders spun together by its threads. It feeds within these cylinders, leaving the epidermis intact, which give to the leaves that scorched up appearance which is characteristic of trees attacked by the caterpillar.

The caterpillar is about half an inch long, of a slightly greenish colour when young, but becomes rosy when full grown. It has a dark red line along the back and along each side, and a brown head. The back of the segment behind the head is also brown. When full fed the caterpillar turns into a chrysalid, of a deep brown colour, in the folded leaf.

The parent of the caterpillar above described is about a little more than three-quarters of an inch in the spread of its wings, shiny, of a pale ashy colour, the upper wings freckled with darker spots. The under wings are of a yellowish grey, satiny, and fringed. The moth may be known by its long and narrow upper wings being laid flat one over the other when at rest, and by the abdomen being depressed or flat. It evidently belongs to the genus *Depressaria*, commonly called the flat-body moths. It is not figured in "Moore's Lepidoptera of Ceylon," and we shall name it temporarily *Depressaria Cocos Nucifera* (?). We hope to give an illustration of the moth in our next.

WATER-LIFTS.

By Aba.

The restrictions put upon chena cultivation by the authorities, and its natural decline owing to the scarcity of forest land to carry on this pernicions system of cultivation makes it desirable to extend the cultivation of those crops which have hitherto been grown on chenas, under wells in parts of the Island where tanks do not exist.

This branch of husbandry is carried on extensively in India where the ryot is enabled to grow his crops during the dry weather or in droughty seasons, and indeed it has been said that "it is also the one practice in native farming to which most care and intellegence is devoted."

The invention, application and introduction of economical means of raising water from wells belongs more properly to the subject of Mechanical Engineering, but the object of this paper is to lay before my readers a description of the three modes of raising water from wells in general use in India.

I. The *Picotta* or *Latha*, the water-lift common to all Oriental countries, is a lever with a bucket at one end attached by means of a pole, and a counterpoise at the other. It works very well and cheaply too for lifting water under 12 feet, but above that height it becomes expensive. It is worked by two men who will work at it from 6 to 8 hours and raise about 700 cubic feet of water

I. The Picotta or Lever Water-lift.

from a depth of 11 feet. This kind of lift is not unknown in Ceylon. It is used for raising water from wells in the public bathing places of Colombo, and to some extent in the irrigation of tobacco and other crops in Jaffna, and a few other places by the Tamil inhabitants.

The following calculations are from *Professional Papers*, Vol. I.

Water raised 16 ft. Content of bucket=·45 c. ft. No. of discharges per minute=3. Discharge per hour=81 c. ft.

Actual discharge per hour=72·9 c. ft.=455·4 gallons.

(To be continued.)

ABOUT THE GROWTH OF TREES.

Dr. William Somerville who made a special study of Sylviculture in Germany,—where so great attention is paid to this subject,—and who was last year appointed lecturer on Forestry in the University of Edinburgh, has published a most useful paper on the growth of trees: in which the results of foreign workers are noted. That the crude sap of trees ascends by the wood, and that the elaborated sap descends by the bast, he says, can be well proved experimentally. If a ring of bark (which contains the bast) be removed from a tree at the height of a few feet from the ground, and if the stem below be destitute of branches, no growth will take place below the ring after the first year—the little that does take place being due to the consumption of reserve materials; above the rings ordinary growth takes place. The upward flow does not support cambium activity, and is thus practically not plant food till it is elaborated in the leaves.

Death of a "ringed" tree however will occur before very long owing (1) to the death of the exposed alburnum under the action of minute fungi, or (2) what usually puts an end to it, the death of the root hairs which are no longer nourished owing to the check given to the downward flow. This can be proved by ringing one of the limbs of a forked stem. The behaviour of this limb will be similar to that of the stem, only that the tree will continue to grow for a much longer period, for the limb or limbs which were not ringed will send down nourishment to the root to keep them healthy so as to send up water and mineral matter.

Under the most favourable conditions of growth a tree produces more nutriment than is actually required to supply the want of the cambium. If a cross-section of a healthy tree be examined with the microscope, it will be found that the cells of the medullary rays as well as certain cells lying parallel to the axis of the stem hold large quantities of reserve food, especially starch, these being scarcely found near the centre of large trees, but abundantly so towards the outer parts especially in the alburnum. Experiment tends to prove that the capacity to bear seed is regulated by the amount of reserve materials collected by the tree.

The almost total absence of starch in duramen, and its presence in alburnum, is a circumstance connected in a very direct manner with the difference in durability of these two parts of tree. It is well known that the outside wood has not the same power of resisting the attacks of fungi as the wood lying nearer the centre. The fungi which cause decay cannot live without food, and the food best suited to the growth and development of many fungi is just the kind found in the storehouse of the tree. When the spores germinate on heartfood the young fungi do not find the means to sustain life and quickly die; whereas in the sap-wood all is present that they require, and consequently if moisture and heat be forthcoming, rapid increase takes place and the wood is soon destroyed. The absence of starch from the duramen is not the only cause of its greater durability—the depositions of gums, resins, &c., being even more influential.

In an annual ring of wood the spring-wood is known to be not so firm as the autumn-wood. The preponderance of the latter it is that regulates the specific gravity of woods, and specific gravity is probably the best test which can be conveniently applied to discover their quality. Two theories have been advanced to account for this peculiarity of this wood-ring. The older and more generally accepted one is known as De Vries and Sachs' "Bark-pressure Theory." Put shortly it is as follows:—In winter owing to the mollifying action of water, to its freezing and thawing, and to changes of temperature generally, the bark is considerably loosened, so that in spring when activity of the cambium recommences, much less pressure is offered to the growth of new cells than is the case in the latter parts of the season, when the bark presses on the cambium very tightly, owing to the wood having increased in volume. In the early part of a growing season the cambium rapidly produces wood under reduced pressure, the wood being consequently very porous, whereas in autumn the wood produced is very dense, because the cambium is then working under greater pressure. The other and newer theory may be called Hartig's "Nutrition Theory," according to which the spring-wood is not so firm as the autumn-wood, because, in the early part of a growing season, the conditions are not present which enable a tree to assimilate rapidly, and therefore there is not so much plant-food available for the formation of cell-wall materials.

An argument in support of the "Bark pressure theory" is, that if the pressure on the cambium be relieved, naturally or artificially, the part of ring formed at the point of relief is broader than any other. For example, if the outside rings of a section of an old thick-barked stem be examined, it will be seen that they do not follow a regular course, but pursue a more or less undulating one. A careful examination will show that the points of swelling correspond to places where deep fissures occur in the bark, that is to say, places where pressure is reduced—while the points where the rings bend in towards the centre correspond to places where the bark is firm and entire. The same thing may be seen on a larger scale, where by any means a tree has been longitudinally cracked. If the rupture is of long standing, the circular

character of a cross-section is more or less departed from, for, owing to the excessive growth in the neighbourhood of the cracks, induced by reduction of the pressure on the cambium, the tree shows a striking protuberance on that point.

THE PLOUGH AND DRAUGHT ANIMALS

One great objection raised at first to the use of the Improved Plough in paddy cultivation was that the weak and puny cattle commonly used by our farmers could not draw the heavy iron implement. But this objection has been in a large measure met by the introduction of light ploughs, such as the "Vitis" and the "Cingalee" made by Messrs. Howard & Co. at Bedford, and the "Indian Ryot" and "Patent Pipe" ploughs by Messrs. Massey & Co. at Madras. These ploughs, while they retain the mould-board &c. essential for the inversion of the soil, are much in keeping with native taste in point of lightness, and in having a single handle so as to admit of being worked without an extra driver. But still native farmers will complain that the draught animals find it more tiresome to draw these new ploughs; and this is not to be wondered at when we see that the work done by the iron plough is more thorough by far than that done by the wooden village ploughs or rather cultivators.

But this state of things naturally suggests that improvement is needed in the other direction as well:—I mean in the draught animals. And how is this to be done?

1. The importation of stronger foreign breeds of cattle might be suggested. But this can only be done by rich farmers who can afford the purchase and upkeep of these animals.

2. Again we might obtain better draught cattle by crossing our country ones with some suitable foreign breed. This can be done even by the poorer class of farmers, provided they can get the opportunity of crossing their cows with superior breeding bulls belonging to their richer neighbours. Such bulls are not, however, so common here as they ought to be; and this method of obtaining improved draught cattle could only be effected gradually. Some of our rich native landlords have indeed, I am aware, imported good strong foreign cattle, and the services of their breeding bulls are, I believe, readily lent when applied for. But as yet this sort of improvement is being carried on only to a very limited extent, and there seems no likelihood of its being extensively adopted in the near future.

3. While the two previous methods of obtaining superior draught animals are very good in their proper place, it is easier by far, and is practicable by both rich and poor alike, to make the most of the animals which are to be had at present in our country, and which are already in use.

The improved plough demands a greater draught as it turns over the soil; and therefore the cattle should be fed with good nourishing food so as to nerve them up for the work. Forage crops must be grown; and fodder must be suitably preserved for dry weather.

All animals used in breeding stock for draught purposes should be carefully selected and properly fed.

Improvement is also possible in the method the animals are yoked to the plough. It has been suggested to me by a European Government official in Jaffna that the animals should be yoked so as to place the line of draught more horizontally, as in the case of the harnessing of horses. This method of yoking would balance the weight properly on the body of the animal, and enable it to use its full force in effecting the draught. This would be especially true in the case of the buffalo. It has no hump; and it is very clear that when provided with a collar such as is used for the horse, the buffalo would draw the plough much better than it now does. Of course a little extra training might be necessary then. In China the plough is drawn by a single buffalo or ox harnessed in this manner. What might we not expect then from a pair of huge strong village buffaloes when their draught power is economized in this way to the best advantage?

Haputale. E. T. Hoole.

(To be continued.)

[The force "absorbed" by the different parts of an ordinary swing plough has been calculated as follows:—

Resistance by Share & Coulter	..	44	per cent
Sole-friction	..	15	"
Friction on land side, *i.e.* on cheek plate	..	35	"
Mould-board	..	6	"

The directions of resistance are in 3 planes: (1) Perpendicular as in cheek-plate, (2) Horizontal as in sole, and (3) Curved, following surface of mould-board.—Ed.]

NOTES FROM A TRAVELLER'S DIARY.

The cultivation of cocoa, in districts where the tree thrives, by natives who have the land, is a commendable industry. In Lower Dumbara, for instance, the natives go in a good deal for cocoa-growing. A full-grown tree will yield on an average nearly Re 1 a year, and three hundred trees will more than supply the wants of a family possessing an acre of land.

Now that coffee is allowed to grow under less artificial conditions than it used to, the trees (and particularly those growing under shade) look quite robust, and are not affected with leaf disease to any appreciable extent, while a splendid crop of berries is generally to be seen. In fact some proprietors are planting coffee, and I have seen the old discarded pulping machines being brought into requisition once again.

My attention was drawn to a tract of paddy land bordering the Rattota road, about 3 miles from Matale, and reputed to have very fertile soil. At the time I visited the place, the ground was almost completely covered over with a growth of weeds known in Sinhalese as *Peti-thora*, the botanical name of which is *Cassia Occidentalis.* The plant belongs to the order leguminosæ, and it struck me that it was more than probable (from the fact that the plants of this order have the peculiar property of fixing nitrogen from the atmosphere and accumulating it in the soil) that the fertility of the soil may be due to the land lying periodically fallow under a crop of these weeds. *Peti-thora* is commonly met with in most parts of the Island, and if experiment confirm my theory, it would be an inexpensive

and commendable means of improving poor soils to have land under a crop-fallow of this plant and use the crop as green manure. The leaf of the plant is sometimes made into a curry by the natives.

A good many goiyas attribute their unfortunate condition to coffee-cultivation for more than one reason. They depended too much on coffee in its good days, and neglected their paddy-fields, and now that they are obliged to return to paddy cultivation, they find that owing to the destruction of forests (the influence of which they are intelligent enough to recognise) the streams which once fed their *êlas* have dried up, and they are unable to get a sufficient supply of water to irrigate their fields at the proper season.

At the time of the native Rajas, they say that a man who possessed a very small area of paddy land—even a *péle* sowing-extent—had his *viatuwa* or paddy-barn for storing the grain. At that time, too, his wants were few, and he lived, what seemed to him, in affluence. Now, however, owing both to small returns and the comparatively expensive habits of life he acquired in the prosperous days of coffee, he finds it a difficult problem to make both ends meet. Once a palm-leaf was a sufficient protection from the sun, now he must have his umbrella and such articles of apparel to which his so-called civilization has introduced him. The apathy generated by the luxurious life of the past clings to him still, and while he can, if he is industrious, make a comfortable living out of arecanut, pepper or cotton, he is unequal to the effort.

INDIAN CORN.

Zea Mays of the natural order *Graminaceæ*. It is also called maize and Turkey corn. The male and female flowers are found on the same plant (hence monœcious). The male blossoms are produced in elegant loose wavy spikes at the summits of the stems, some of a cream colour, other varieties with a limit of red.

The fertile flowers are produced from a compound sheath arising from the bosoms of the leaves, deep set in their axils; they are two, three or more in number on each plant. The corn is arranged in upright or spiral ranks, firmly embedded in a receptacle which is termed the cob.

This is sufficient to convey some idea of the botanical character of this truly interesting and beautiful plant; and as it has lately been spoken of and noticed as worthy of attention, I am impelled to take up this subject with which I am familiar. As His Excellency the Governor desired the people of Matale to grow Indian corn, and the season of the year is somewhat favourable to the setting apart and preparation of an experimental plot, I think it advisable to adduce so much of my own experience as may enable those who are interested in the attempt to make a trial of a method which cannot mislead.

1. Select the best and softest loam of the garden. Such a soil is always fertile if duly tilled, and to none is it better suited than to maize, particularly if the site be open and fully exposed to the sun.

2. At any favourable period during the early part of the year, make trenches three or four feet asunder, taking out six inches of the earth, and digging into the trench a good three inch layer of rotten manure. Let the trenches point south and north, or nearly so as possible, and leave the work to settle for a few weeks, being guided herein by the warm and dry state of the weather, because a cold rainy season would be just as inimical to Indian corn as to cotton crops.

Taking the 1st of July as a suitable time, fill the trenches with fine soil to within three inches of the previous level, stretch a rope and dot in three seeds in a triangle, five or six inches apart, at every foot throughout the length of the rows. Cover them with an inch of earth and press firmly. If the weather become very dry it will be advisable to soak the soil with water two or three times till the plants germinate, and to cover the trenches with mats or leaves during the heat of the sun. Most of the seeds will germinate, but they are liable to accidents, and are often devoured; and as every foot should contain one plant at least, the precaution should be taken to sow a few dozens of seeds in small pots, so that a blank may always be filled up when it has become evident that the seed sown has been destroyed.

When growth appears to be fully established and the plants stand at regular distances, a light hoeing must be made along the trenches; and at the same time the practice of the Peruvians may be safely imitated, particularly in dry seasons, by forming a small ring or basin round the stem of each, sprinkling a little manure in the cavity so as not to touch the stem, and flooding the ground with water.

3. After a time, when the plants obtain a foot in height, three inches of the earth removed from the trenches should be returned, so as nearly to level the ground. In a short time the remaining earth should be brought against the stems, to protect them from the force of high wind.

4. When the male spikes are formed at the summits, it will be beneficial to cover the surface between the rows with an inch of manure or to sprinkle a little liquid manure.

Whatever be the dressing, it should be dug in with the fork, care being taken not to injure the roots and stems. This manuring will cause the foliage to assure a dark rich green, which it will retain during the hottest and driest season.

When the farina from the male spikes shall cease to be discharged, the plants can safely be cut back to within two leaves of the upper ear, and the corn will equally advance to maturity.

My experience proves that as an average December is the harvest month. The plants begin to ripen by losing the green colour, and assuming a pale brown tint; and then the seeds acquire their glossy yellow-cream colour, or pale brown. Birds are very fond of the seed and will penetrate husks till they reach the cob; therefore it is desirable to pull off every one as it becomes ripe.

Whether Indian corn can be profitably introduced, is somewhat questionable. One objection is the lateness of the ripening season and the irregular maturing of the ears. The cultivator will find in the above directions which will guide him in undertaking

an experiment, and it is advisable to make trials in different localities. The grain is truly valuable, is an excellent food for cattle and fowls, and makes good bread with wheat flour.

In India it is often sown as a catch crop before the rabi crop of wheat or barley. It is seen growing to great perfection, says Prof. Wallace, in the neighbourhood of Darjeeling as well as in areas of wider extent in the plains. Along with amarantas it may now be considered the chief food of the hill tribes of the North-Western Himalaya.

Bandaragama. J. A. J. Rodrigo.

GENERAL ITEMS.

We omitted to mention our good fortune in securing a young plant of the Victoria Regia which has been placed in a tank in the School of Agriculture grounds.

It is worthy of record that the culms of a giant bamboo in the Peradeniya Gardens shot up at an astonishing rate in April last year. One of these is said to have grown at the rate of $13\frac{1}{2}$ inches in 24 hours.

The case of a ruminant man is mentioned in the *British Medical Journal* for May. Dr. Leva of Zürich at a meeting in that city exhibited a man of 22 who possessed the power of rumination. From 5 to 30 minutes after each meal the ingested food continued to rise up into the patient's mouth, to be masticated and swallowed again and again, the lad relishing the cuds all through. The process lasts from 70 to 90 minutes. The patient has no control over the process. A careful examination of the pharynx, gullet, and stomach failed to reveal anything abnormal. He states that rumination first appeared about 6 years before his coming under observation, when he had been in the service of a very stingy master. The meals being scarce and the lad's appetite very keen, he acquired the habit of swallowing again the morsels of food which came up into his mouth!

The New B. I. steamer *Alaska* is, according to the *Indian Agriculturist*, to be specially employed in providing steam communication between Negapatam and Colombo—the duration of the voyage, during which 4 or 5 intermediate ports will be touched at, being about a day and a half. The principal trade will be in rice. For coolie emigrants from Indian ports to Colombo the charge will be R4 per head, from Ceylon ports R2 and under.

The trade in ground-nuts is reaching enormous proportions. The estimated value of the ground-nut export during 1889 in India was 122 lakhs of rupees, of which 99 per cent was produced in British India.

Professor Wallace has brought out a revised edition of his "Live Stock of the Farm," and is now engaged on another work on the Rural Economy of Australia and New Zealand, which will very shortly appear.

Much curiosity was aroused at the Nawalapitiya Railway Station during the latter end of May over a tree which had been cut down to some 3 or 4 feet from the ground, from the exposed section of the stem of which there was a continual drip of water. The tree in question was, if we are not mistaken, a *Thunbergia* creeper, with a stem not more than 2 or 3 inches in diameter. According to the Station-master, the dripping had been going on for a fortnight, and showed no signs of ceasing.

A curious case was reported from Mutwal the other day. It seems that a bull commenced bleeding most profusely, and that the blood which issued from the region of the penis continued to flow for more than 24 hours, despite all the efforts of the local Vederalas to stop it by copious draughts. The case coming under the notice of a Medical gentleman in the neighbourhood, he, instantly guessing at the cause of the hemorrhage, syringed a strong solution of salt into the sheath of the penis, when the bleeding almost immediately ceased. The *fons mali*, as may be inferred, was a leech.

The Swanley Horticultural College has for its main object the encouragement and improvement of fruit farming in Great Britain. The principal of this institution is Prof. Frank Cheshire, and among the lecturers is Mr. Cecil Hooper, F.H.A.S., who was a student both at Cirencester and Edinburgh. Mr. Hooper has just written a very able paper on Fruit Farming, the possibility of its extension, and the remuneration to be derived from it, which appears in the last number of the Highland and Agricultural Society's transactions. The Swanley College has an experimental garden of 43 acres attached to it.

It is reported by a correspondent in the *Field* that at Inveradoch, Doone, on the 24th May, a single egg produced two pheasants.

A copy of the *Bosphore Egyptien* to hand gives a sketch of the plan upon which the Agricultural Department and College about to be founded in Egypt are to be established. Mr. Williamson Wallace, the Director, is actively engaged in making himself acquainted with the needs of the country and the means of improvement to be adopted. In a chatty letter received from him from Cairo he says, "I have a lot of hard work—up early in the morning, and off to see the agriculture of the country. The Government have given me a house-boat in which I go about all through Egypt, and have a look at every thing."

The local Governments of India have been asked to send delegates to an Agricultural Conference proposed to be held at Simla in October this year, before the return of Dr. Voelcker to England.

The mummified cats exhumed from an ancient cemetery not far from Cairo—some 20 tons—have, it is said, been brought over to England with the intention of selling them for manure.

Selentropism is the proposed name for the phenomenon of plants turning towards the moon. M. Musset has made careful observations on this subject, and concludes that the stems even

of adult plants undoubtedly turn towards the moon on fine clear nights.

Mr. Kanes-Jackson has lately written a sensational letter to the London *Times* on "The Earth losing Primal Fertility." He asserts that in about a hundred thousand years or so there will be nothing produced on the earth. Not long ago another alarmist endeavoured to show that phosphoric acid at least would be completely exhausted in the soil before long. We have really had enough of these pessimistic theories already.

Hyriyal (හිරියල්) *Arsenicum auripigmentum* is sulphuret of arsenic, and sadilingam (සාදිලිංගම්) is vermilion or mercury sulphide which occurs native as cinnabar the chief ore of mercury. The former is of a reddish-yellow colour and is largely used by the natives in painting, the latter is of a reddish hue and also used by the natives in painting images, &c.—the hyriyal, according to a correspondent, being sprinkled over the vermilion to give it a gloss. Both these substances are sold in the native bazaars.

SCHOOL NEWS.

The Agricultural Improvement Society met on Friday the 11th July for the first time after the holidays, when a paper on the past and present state of paddy cultivation was read by Mr. Estagoepillai. The subject was ably dealt with by the writer, and many interesting points were brought out, and discussed by the members. Mr. Mendis consented to read a paper on the opening out of new land by agriculturists in Ceylon at the next meeting.

We acknowledge with thanks the receipt of a packet of geological specimens from Mr. Theodore Gooneratne of Matara, and a mat of gorgeous design made of the fibre of Niyande (Sansievera Zeylanica) from Mr. E. M. B. Seneviratne.

The results of the half-yearly examinations held in May show that Mr. J. Kodipilly and Mr. Johannes stand at the head of the Senior and Junior classes respectively.

The Seniors are having a few special lectures in Zoology as bearing on Agriculture before the end of the session, which also terminates their connection with the School.

The printed Syllabus of the school is now ready, and is got up with the neatness characteristic of the Government printing press.

During the *Maha* season (July to November) of last year seedlings grown from four seers of *Ma wi* paddy were transplanted. The field was prepared, as has been the case since the introduction of the iron ploughs, by ploughing before the setting in of the regular monsoon rains and leaving the soil exposed to the action of the weather for six weeks before the final preparation of the land for sowing. No manure was applied. The seedlings were planted 6 inches apart each way. The plants tillered and grew very well The crop was reaped towards the end of March last and yielded 9 bushels of paddy.

In May a small plot of ground was planted with Indian Corn. The soil is a free sandy loam. It was twice dug over with the mamotie and thrown into ridges 3 ft. apart. Trenches were made on the top of these ridges and well-rotted cowdung was applied and covered over with soil. The seed was dibbled in on the top of the ridges 4 inches apart. The seed used was procured from the bazaars, but it is hoped that a better variety as the Queensland or Cuzco would be obtained for regular cultivation. The plants came up well for a time, but the very dry weather which prevailed in May and June killed most of them. The plants that survived have grown vigourously and are now flowing three months after planting. The crop was hand hoed once and watered three times. Indian Corn occupies an important place as one of the best food crops, and there is no reason why it should not be more extensively grown. Under ordinary cultivation 200 lb. of grain may be grown per acre on good soils, besides $2\frac{1}{2}$ to 3 tons of straw may be expected per acre. This straw is rich in saccharine matter, and is a valuable food for all kinds of farm-stock. Indian Corn is admirably suited for growing in the intermediate spaces left in cotton cultivation. It only occupies the land for about 4 months, and will pay at least all the expenses and leave the cotton which is sold for profit, thus obviating the usual objection of the unprofitableness of cotton cultivation. Indian Corn may be successfully grown as a fodder crop. About 12 to 13,000 lb. of fodder may be expected per acre, and this fodder is highly prized in America as a food for milch cows. On a previous occasion a small plot of land planted with Indian corn was entirely destroyed by field mice which dug up and ate all the seeds in the night. It is advisable therefore to tar the seed before sowing to preserve it from the attacks of mice, squirrels, &c. If Indian Corn is grown alone, the seed should be sown in rows 3 feet apart at the rate of about 30 lb. per acre. If cultivated with cotton, the rows of corn should be 4 ft. apart, and those of cotton the same distance alternately.

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THE BARREN SOILS OF CEYLON.

WE have been asked for information as to the nature of any experiments hitherto made with the object of restoring fertility to the soils met with in various parts of this island, which seem to be generally regarded as being in their present condition of no use to the agriculturist. It is unfortunately the case that a very large area of land is to be met with in widely scattered districts that seems for some reason or other to be possessed of that character, and those districts differ greatly in the appearance of their soils, and, also in the constituents composing them. There are the well-known extensive patanas of Uva and our higher lands generally, and there is a very extensive acreage of what is commonly known as the black cotton soil met so largely in the Mannar and other districts of the Northern and North-Central Provinces and in the neighbourhood of Puttalam in the North-west Province. Much of this soil, while of the consistency of soft mud in the wet season, is hard, at least on the surface, and scored by innumerable cracks in the dry season. It is pointed out to us by our querist that, as the population of Ceylon increases—and we know that this development proceeds at a fair average pace—the greater part of these lands now lying waste must come into demand for cultivation. The question raised is, as to what forms of growth these soils may be adapted to and by what means that adaptation may be secured and extended.

Probably the only view that can be advanced in reply to such a query must be an economical one. We should doubt exceedingly if there could be found any soil in Ceylon which, by some forms of treatment, could not be improved to some degree of fertility. We have seen in English experience how even the siliceous sands of lands recovered from the sea have, by the application of sewage, been converted into smiling fields, yielding in due season their plentiful harvests. If such an apparently hopeless recipient can be made the basis for the admixture of fertilizing constituents, it is certain we need not fear that even our poorest soils in this island would be unsusceptible of similar treatment, to be followed by similar success. But the 'drenching' so to speak of long untilled lands with an almost unlimited supply of manurial stimulants, such as has converted as above described the sands of the sea into cultivable fields, is, for very many reasons, of course impracticable with us. We only cite the case as an example to show how needless would be the fear that the barren lands of this island must, all of them for ever remain in their present condition of uselessness. There is more of physical as well as intellectual improvement wrapped up in the future than "has been dreamed of in our philosophy."

But it is suggested to us that—as is well-known to be the case—a good deal of the land that comes within the category we have mentioned has in former times been under cultivation which ceased with the existence of a population adequate to continue it. It is the fact, we believe, that land of a certain character and in certain conditions, which cannot be classed as "virgin," deteriorates rapidly from want of cultivation. This is not the case with soils that have never been disturbed by man, and it is suggested that the deterioration in instances when such disturbance has occurred is due to the cessation of aeration of the subsoil. We cannot profess, of course, to write upon this subject with the authority of an expert in such matters; but it is known to all of us what different results follow deep ploughing, and the consequent free exposure to air of the soil and the immediately underlying subsoil, to those which attend mere surface scratching. The theory advanced, therefore, that these lands of ours which in a byegone time were probably under full annual cultivation now fail of fertility owing to the absence of free aeration, may not be altogether wide of the mark. At all events, as it has been suggested to us, experiments might well be tried by Government Agents and their Assistants in different localities with the object of testing this theory. A few acres of patana, black cotton, and other at present unproductive soils, might be ploughed deeply, and left in that state to aerate for one or two successive seasons, after which some sort of cultivation deemed likely to be most suitable might be tried upon them. Should success follow, a clue might be gained to the secret by which these lands might be rendered serviceable, independently of any attempt—which we

should deem to be, for the present at least, economically impracticable—to restore their fertility by manuring. There are doubtless scientists among us who could say whether the suggestion made to us may or may not be of a hopeful or possible character.

The patana soils are many of them barren from the presence of ironin forms most unfavourable to fertility, while considerable portions are composed of quartzite. Then in such places as Nuwara Eliya and in swamps near Colombo and elsewhere, there are black pseudo-peat soils, which are unproductive from the opposite cause: the absence of mineral matter amongst the humus. In each case improvement might be effected by aeration, as we have already indicated; by a full dressing of lime (especially in the case of the black vegetable soils); and by tillage. The experiment of draining, liming and carefully tilling of some of the Nuwara Eliya swamps, ought to be amongst the measures adopted for the improvement of our sanatorium, now the subject of discussion. Experience thus obtained might be a valuable guide for the reclamation of similar formations elsewhere. In attempts which have been made to cultivate portions of the upland prairies called patanas, we are bound, however, to state that for the first few years at any rate, a perfect plague of cockchafer grubs has had to be contended with. On Meddecumbera, we believe, that even aloe plants were destroyed by these pests, which, we know, played havoc with cinchonas grown on grass land in another part of Dimbula. But caustic lime ought to go far as a remedy for the beetle larvæ.

GAMBIER IN CEYLON.

A planting correspondent wrote to us the other day about an article in the "Magazine of the School of Agriculture" (incorporated with our monthly issue) which, according to him, stated that.

"Gambier (*Uncaria Gambier*) is indigenous to the island and a common plant near Colombo, Galle, Deltota and Dumbara and that the late Mr. W. Ferguson made an extract from the shrub,—but he omits the native name—and I see no mention of gambier in your new book. As this is cultivated so largely in Singapore, it appears strange that it is comparatively unknown here, and now we are told that it is a common plant."

A correspondent favours us with a fuller summary of the Magazine paper as follows:—

The identity of the plant which produces the valuable substance known as gambier or Terra Japonica has been the subject of a good deal of discussion and has well illustrated the old adage of doctors (in this case botanical doctors) *disagreeing*. While Dr. Thwaites held that the species of Uncaria found in Ceylon was the *Uncaria Gambier*, leaving it on record in his "Enumeratio" that he cannot doubt that the indigenous plant is identical with that of Roxburgh, Dr. Trimen avers that the two are distinct. [No, there has been no *disagreement* whatever, only an advance in knowledge.—ED. *T. A.*] Mr. William Ferguson, F.L.S., in his interesting notes on Ceylon timber trees, states that the extract from the indigenous *Uncaria* is the gambier or terra japonica of commerce, and what is more, he claims to be the first to have prepared the substance from the Ceylon tree.

Dr. Trimen, however, says that Sir Joseph Hooker has shown that the indigenous species is not *Uncaria Gambier* but is to be referred as a variety Thwaitesii to *U. dasyoneura*, and moreover that it affords no gambier, at least that he (Dr. T.) was unable to produce anything like the substance. Up to this time then, to gather from Dr Trimen's last report, there is no plant of the true gambier in the island, and all efforts to introduce it have been unsuccessful

So much for the identity of the plant: but if a substance with all the valuable properties of the true Terra Japonica can be extracted from our indigenous variety, then we may well exclaim "What's in a name!" and go in for cultivation as hard as ever, for did not Evans of Stackpole Street promise to take 8 to 10,000 tons of gambier from us every year?

On this subject, Dr. Trimen is good enough to write:—

UNCARIA EXTRACT.—As regards the extract from our wild Ceylon species of *Uncaria* my experience was recorded in the Report of the Royal Gardens Kew for 1880 (p. 37) as follows:—"Dr. Trimen, Director of the Royal Botanic Gardens, Peradeniya, writes (September 24th):—'In the urgent demand for "new products" here, one of the first things I tried was to make some Gambier for our plant. It grows commonly not far from the Garden. I followed the account given in the books but could not succeed in producing the correct article. A very excellently astringent extract is easily obtained, but it is black like liquorice or the *acacia catechu* exactly, and not at all like terra japonica.'"

What the extract was like that was made by the late Mr. W. Ferguson (as recorded by him in 1863) it is not now possible to discover, but in all probability it was the same as that obtained by me. The true Gambier, catechu pallidum, or terra japonica of commerce produced at Singapore is a pale yellowish-brown earthy substance.

It should be borne in mind that at the time Mr. Ferguson experimented, no one had any reason to suppose that our plant was not the same as the Singapore one; it was not till 1880 (Fl. Brit. India III. p. 31) that Sir J. Hooker showed the botanical differences.

I may add that I have recently rceived a case of living plants of the true *Uncaria Gambier* from Singapore, and that young specimens are now growing at Peradeniya and Heneratgoda Gardens.—HENRY TRIMEN.

At the same time it is quite possible that the "black extract" from the local plant might be found of some commercial value, and Dr. Trimen quite agrees that it would be worth while to try the market with it. Here again is a paragraph with some practical information bearing on the subject:—

GAMBIER-PLANTING IN JAVA.—The cultivation of gambier in Java has been tried many times, but although the plant grows excellently, extraction has on every occasion yielded a kind of gambier inferior in quality to that produced by the Chinese around Singapore. It is believed that the cause of this inferiority must be sought in the fact that the Chinese during the boiling process add a decoction of the poppy, but the preparation of this decoction and the parts of the poppy used in its manufacture are a secret. As the sale of opium is a strict Government monopoly in the Dutch colonies, and the cultivation of the poppy is not permitted there, it is believed that there is no possibility for the Java planters to compete successfully in this industry.

It is quite possible therefore that even when the true plant becomes plentiful in Ceylon we may have to send to Singapore to obtain the secret of the best means of preparation of the extract for market. We may add that gambier cultivation in Singapore has led to almost as great exhaustion of soil as tobacco cultivation in Java has effected.

CEYLON TEA IN LEAD PACKETS.

To the Editor of the "Grocer."

4, Mincing-lane, E.C., June 18th.

Sir,—It may calm the apprehensions of your correspondent, "A Country Grocer," to learn that by section 2 of the Merchandise Marks Act of 1887 he cannot be held guilty of an offence under the Act, if he proves—

(*a*) That having taken all reasonable precautions against committing an offence against this Act, he had

at the time of the commission of the alleged offence no reason to suspect the genuineness of the trade mark, or trade description; and

(*b*) That on demand made by or on behalf of the prosecutor he gave all the information in his power with respect to the persons from whom he obtained such goods or things; or

(*c*) That otherwise he had acted innocently.

Under these provisions "A Country Grocer," if only he has acted innocently and will give such information as he can about tho goods that he sells, need not fear that he will have to rest his case on the evidence of experts as to quality or the country of origin.

The answer to his question, "Whether misdescription—even if purchasers are not misled by it—as to quality and place of origin, without the assomption of the name or brand of any particular estate, is actionable and punishable," is that tho Act does not require that the purchaser or the public should have been in fact deceived.—I am, &c., WM. MARTIN LEAKE.

PAPER V. LEAD FOR TEA PACKAGES

To the Editor of the "Ceylon Observer."

Kandy, July 17th.

SIR,—At the request of the Chairman I enclose copy of letters regarding Mr. J. Maitland Kirwan's prepared paper for tea packages.—I am, sir, yours faithfully,

A. PHILIP, Secretary.

(*Copy*). Billiter Square Buildings, London, June 27th.

Dear Sir,—I have now pleasure in sending you by this mail another sample of the prepared paper to take the place of tea lead. Since I last corresponded with you I have had a break of Elkadua tea sent home in this paper, one half of the break being packed in this paper and the other half in the ordinary load, the result of sale being precisely the same.

Neither the trade nor anyone else has made any objection to this paper, and as it will cost about 40 per cent less than the lead, there will be little difficulty in introducing it.

I have had application for samples of the paper from Kangra Valley Planters' Association and other firms. You will no doubt now bring this matter before your Association at an early date. I may mention that I intend entirely substituting this paper for the lead on my Elkadua estates where I have close on 1,000 acres of tea.—I am, &c.,

(Signed) JNO. MAITLAND KIRWAN.

L. H. Kelly, Esq., Chairman, Ceylon Planters' Association.

Copy. Castlereagh, July 16th.

Dear Sir,—In reply to yours of June 27th I shall bring the matter before the Association at our meeting on 8th of next month. You do not give cost of paper or how it should be fastened together. I have asked the Secretary of the Association to publish your letter, as the best moans of giving publicity to the merits of the paper.—Yours very truly,

(Signed) L. H. KELLY, Chairman, C. P. A.

P.S.—I may mention that when I received the first samples I brought the matter before the Tea Fund.

DARJEELING PLANTERS' ASSOCIATION.

Proceedings at Committee Meeting of the Darjeeling Planters' Association, held on Saturday 14th June at noon. Present:—Messrs. J. Johnston, F. De Momet, W. Ager, G. G. LeMessurier, J. Calvert, J. Court, G Nash, A. Wernicke, J. D. Gwilt, R. Harrison, Hony. Secretary.

Read letter No. T. A. 3435 dated 27th May 1890, from General Manager, D. H. Railway, offering 7½ per cent, rebate under five years agreement with various Tea Concerns, on all classified goods upwards and downwards over the D. H. Railway, the item of coal being subject to 5 per cent rebate only. Resolved: That these terms be accepted, and be made known to every member of the Association by printed Circular. —*Indian Planters' Gazette.*

NOTES ON PRODUCE AND FINANCE.

A NEW DEPARTURE.

Mr. Lipton, who is in his way a provincial Whiteley, and has shops and stores all over the country, began tho sale of tea, chiefly Indian and Ceylon, about a year ago. During the first year his sales have reached 4,000,000 lb., and he is now turning his attention to America. Mr. Lipton is now in Ceylon, where he is purchasing tea estates for the purpose of growing and supplying his own shops direct with Ceylon tea. We understand that in America Mr. Lipton will sell Ceylon tea only, and thus render material aid to Ceylon planters in the campaign in the United States.

CONDITIONS OF PUBLIC SALE.

The dealers have had their way over the question of the new public sale conditions, and future catalogues of tea will contain the new conditions, by which it will be clearly provided that the tea is ready for delivery, excepting packages which may require to be coopered; and, as some chests are on show before the sale, it is only reasonable that a short time should be given for nailing up such packages. Indian importers have objected to the proviso that all tea must be ready for delivery at the time of sale, but the dealers were equally firm the other way. The importers have yielded, and it is hoped that the new arrangement will work satisfactorily.—*H. and C. Mail.*

COOLY LABOUR ON COFFEE AND TEA ESTATES.

In our issue of the 27th ultimo we published a letter from a planter under the above heading and since then we have received several other letters containing the same complaints. The writer, in the first letter, it will be remembered, complained of the difficulty in procuring labour and in dealing with coolies who, having received advances, keep the money and refuse to work. The estates are in consequence eaten up with jungle and weeds, or as our correspondent put it, "our work is all behind, our coffee is all in weeds, which are eating all the manure we have put in for the benefit of the coffee; not a pit has been made for next year's supply," &c. The grievance is one of long standing though the Government is now less to blame for the state of things giving rise to these complaints than it was formerly. The position of the planter at the present day is very different from what it was in years gone by. He is better provided with police and roads, and in the Breach of Contract Act he possesses the means of obtaining summary justice in cases in which advances have been paid without any work being done for them, and for which formerly a remedy could be sought only in the Civil Courts. Nor is he slow in availing himself of the Act, for as was stated in our review of the annual Report on the administration of criminal justice in Coorg for the year 1889, there were in that year no fewer than 1,648 cases out of a total of 3,624—a large increase of prosecutions as compared with the preceding year. Whether this constant appeal to the law is on the whole a wise policy and likely to conduce to the interest of the planters is doubtful. In any case our correspondent should not complain that "help in any shape or form" is denied planters by the Government to whom "we might as well appeal as to the gods of the heathen." What further assistance do the planters need? The difficulty of finding men against whom warrants have been issued is one incident to all legal procedure and not peculiar to Coorg, or any other planting district.

The emigration of the labouring classes is no doubt a thing to be deplored in the interests of planting industry in this country. "Why," asked our correspondent, "should the Government send cooly labour to foreign countries when it is so much needed nearer home?" The Government does not send cooly labour to Ceylon, Burma, the Mauritius, &c., as the emigration is entirely voluntary; all that the State does is to take care that the coolies are not enticed

by false and fraudulent representations, or ill-treated on the voyage to their place of destination. This draining of the population does seriously affect coffee and other speculations in India; but how is it to be avoided? So long as the wages offered by foreign planters are generally so much higher than those that obtain here; so long as the emigrant coolies are also properly housed, bedded and provided with medical aid, and, in a word, treated with every consideration, emigration will continue as heretofore, and labour in India remain scarce. And nothing is better calculated to promote this result than the frequent prosecutions above alluded to. As to the inducements held out to emigrate, the following, from an old issue of a Trinidad paper, will serve as a sample. "The rates of wages for work, which is principally weeding with the hoe, vary from 8 annas to 10 annas for a fixed portion of work, which may always be performed by an adult of average strength in five hours at most. A day's work of nine hours' duration is paid at for the rate of annas 13½ and during the crop (the season for manufacturing the cane juice into sugar) the ordinary work for all employed is paid for at the rate of annas 13½. Those employed in keeping up the fire boiling the juice of the cane, superintendents of work and trenchers, are paid annas 16⅞ as those descriptions of work require greater attention." The Emigration Agent at Trinidad also offers the coolies houses, gardens and medical attendance free of charge, and states that after ten years' residence they will be provided with a passage home, and that thrifty coolies have been known to return with as much as R1,000 to R1,500 each.—*Madras Mail*, July 9th.

COFFEE CULTIVATION IN THE TRANSVAAL.

On Monday afternoon Mr. H. M. Pasteur read a paper upon this subject at the Chamber of Commerce. Mr. Robert Wales, who presided, in introducing the lecturer, stated that the coffee question was one of vital importance. There could be no doubt that the consumption of the article was overtaking the growth, and anyone who could point out a region yet unoccupied, which would produce coffee, was a great friend to the trade.

THE CONSUMPTION OF COFFEE.

In England we did not appreciate fully the extent of the coffee trade, for our portion of the consumption was so exceedingly small that people were apt to think it a very small trade in consequence. England only consumed 15,000 tons per annum; the yearly consumption, however, of the United States and Europe was no less than 600,000 tons. The coffee trade deserved more attention from English traders than it had hitherto received. Mr. Pasteur, who has recently visited the Transvaal, stated that many parts of that State were exceedingly well suited to the production of coffee. The Transvaal was a vast tract of country situated between 22 and 27 degrees of latitude, and the regions of that country in which coffee could be grown, viz., the central and northern districts, occupied 2 to 2½ degrees. These districts were Waterburg, Rustemburg, Lydenburg, and Zoutpansburg. The districts of Waterburg and Lydenburg were surrounded by mountain ranges from 2,000ft. to 2,500ft. above the valleys, which were themselves 2,500ft. above the sea level. Some of the land between these ranges was very rocky, and grew nothing but coarse grass and stunted mimosas; but there were also fine stretches of deep, rich alluvial soil, in which almost any kind of tropical produce would grow. In the course of a journey he had made in the western and northern districts he had seen some very fine coffee trees—large and healthy—from twelve to fifteen years old, without a sign of leaf disease on them, and bearing a heavy crop. The proprietor of these trees stated the average production per tree was 2lb. per annum, and this without any care being bestowed upon them. They were protected from the sun and cold winds by a shadow plantation.

LUXURIANT COFFEE PLANTATIONS.

At a farm belonging to Mr. de Beer, seventy miles north of Pretoria, he had seen coffee trees fifteen to twenty years old presenting a very much more luxuriant appearance, being from thirteen to fourteen feet in height. These trees must have yielded five tons an acre, taking the acre to contain 5,000 trees.* In this instance the plantation was protected from the sun and cold wind by a belt of banana trees. The lecturer also gave several other accounts of luxuriant coffee plantations he had witnessed in the Transvaal. In the future development of coffee, the question of labour was likely to be the greatest difficulty to contend with. Kaffirs were very erratic in their habits, naturally indolent, always talking and laughing, without the least idea of the value of time, and required constant supervision. The best way to obtain sufficient labour would probably be to come to some arrangement with the chief of the locality. If his goodwill was secured, his hold over the people was almost certain to be powerful enough to induce them to work on a plantation instead of tramping to Johannesburg and Kimberley the more so if they found they were paid regularly, and got good food. Coffee had been, and was still, cultivated in Natal, where it had suffered much from leaf disease. The plantations there had been much neglected during the years of low prices, and possibly in this way a good deal of damage had been done. The elevation of Natal, however, from the experience of India and Ceylon, was found not to be conducive to the best cultivation of coffee. In the somewhat tropical districts, where coffee cultivation could be introduced the rains took place in the months of January and April, with occasional showers between October and December.

TEA AND COFFEE CAN BE GROWN.

Mr. Pasteur stated that the remarks he had made respecting coffee applied equally to tea, and he considered there was a fine opening for many of our countrymen who had acquired experience as tea planters or coffee growers in India or elsewhere. The development which was bound to follow the opening up of the goldfields would make it unnecessary for the Transvaal coffee growers to export for many years to come. Sir Frederick Young stated briefly that his experience of South Africa entirely confirmed Mr. Pasteur's remarks. The county was capable of growing anything. Mr. Hume asked if the shadow trees were essential to the growth of the coffee tree. Mr. Pasteur replied, "Not absoultely necessary, but greatly conducive to the well-being of the plant." Mr. A. G. V. Conybeare, M.P., also stated that in the extreme west of the Transvaal, sugar, oranges, and tobacco, as well as coffee, could be grown in any quantity. Mr. E. A. Rucker moved a vote of thanks to Mr. Pasteur which was seconded by Mr. Parker, and the proceedings then terminated.—*H. & C. Mail*, June 28th.

ENDLESS WIRE-ROPEWAY AND ESTATE TRANSPORT.

We are requested to publish the following description of "wire-ropeway" with reference to the utility of the invention for planting districts in Ceylon. But is Mr. Davis aware how far the system has been already utilised in Ceylon? For instance on Spring Valley estate, Badulla, for many years now, a wire-ropeway worked by a water-wheel has been steadily at work, utilised regularly for the transport of grass and manure and possibly of produce. It may be that "Roe and Bedlington's improved system" may be an advance on that of Spring Valley. It certainly behoves Ceylon tea planters to

* 5,000 trees 13 to 14 feet in height per acre 500, probably, nearer the mark.—Ed *T. A.*

give attention to every available means of economising labour. Here is the description:—

Roe and Bedlington's improved system of wire rope way consists of an endless rope from which the load is suspended and by which it is also carried along. The rope is driven by power at one end and is supported along the line of transport by trestles (of iron or wood) the load is carried by buckets or clip hooks: these are attached to the rope by a saddle which converts the weight of the load into the required grip. The sheaves on the trestles are so arranged that there is no danger of the saddle becoming unshipped as it passes over them and to take long spans and varied gradients there are double, treble and quadruple balanced sheaves, mounted tandem wise, which automatically adjust themselves to an equal share of the pressure. The saddles are provided with two grooved wheels at the outside (of the rope-gripping part) which run on to shunt rails at the station and thus remove the load from the rope. Should the required power be available in water (or steam) at some point in the required line of transport, a rope can be worked from either side and the load transferred from one rope to the other by shunt rails. Curves of large radius may be worked, but one of the great advantages of the invention is that the way can be laid in a straight line over rough country (without high and expensive trestles) thereby reducing the distance to be travelled to a minimum.

CEYLON UPCOUNTRY PLANTING REPORT.

CACAO—JAK AND PEPPER—BLACK BUG ON COFFEE—WEATHER—A DISAPPOINTED PLANTER—ARRIVAL OF COOLIES.

July 18th.

The awful gulf between the prices paid for most West Indian *cacao*, and what the Ceylon lots get is awaking inquiry on the other side of the world, as to how the thing is done. It is not a little flattering to Ceylon men and their methods of curing, that an official communication has been received from the West Indies, asking for information on all points connected with cacao curing. It does look like teaching your grandmother to suck eggs, for if experts in cacao culture were to be found anywhere one would naturally look for them in the other colonies, where the chocolate tree has been long a stand-by.

One of your correspondents, referring to what I said in my last as to sturdy jaks being killed out with pepper, seems to think that the jak is coming in for a bad time, and that vigorous trees are not to be seen. All I can say is that I have not seen anything like weakness among jaks, and since I read his remarks I have been particular when going about to specially observe them.

The jak of course won't stand abandonment: and on estates or portions of estates which have gone out of cultivation, and where jak has been growing, there you will see the slow stranglement of the tree by the vigorous undergrowth.

But where the jak is getting anything like ordinary treatment, I find it as sturdy, its foliage as glossy, and its fruit as plentiful, as ever I knew it. So inimical is the jak to utter neglect, that its presence on a piece of land is I understand accepted by our Courts as evidence of cultivation or recent cultivation.

That a pepper vine can kill a jak, I find disputed by one who has a very extensive agricultural knowledge. When a jak dies that has been supporting pepper, he would not attribute that to the effects of the pepper, but would be inclined to look elsewhere for a reason. He has known jaks which have supported pepper vines for a quarter of a century and more and there was no evil resulting from the association. I was glad to get this opinion, for although it goes against my own observation and what other men have told me, it will prevent a too hasty inference, and the total condemnation of a valued auxiliary.

Black bug has within the last three or four weeks come very much in evidence in what little patches of coffee there remain. This is very disappointing, for it has been looking so well for months back, that hope induced one to believe that it had turned over a new leaf. What hecatombs of hopes have been sacrificed to coffee, and are still. I fancy as long as a few patches remain, and a few bushels are to be gathered, the old methods will continue.

The weather has changed to showery, but we want a good twenty-four hours downpour to get a proper soaking. All the same we are thankful for what we are getting, as the longcontinued drought was shutting everything up. A planter calling at a store which was rather famed for "Sorry, but just out of it at present," asked for marmalade. Alas! there was none: and the storekeeper when intimating the fact, and expressing regret, carried with him a stone jar in his hand. "This" he said, "holding the jar up, is the nearest we have." The planter glanced at it, read Day & Martin's Blacking, and then fled. I wonder if it can be true?

Coolies are plentiful and healthy, and arrivals from the coast continue to come in in small batches. But for this abominable exchange we might be happy. It is at present most in our thoughts. A fine dance it is leading us.

PEPPERCORN.

THE WEALTH OF INDIA.

From Mr. Birkmyre's curious pamphlet* we make a few striking extracts:—

Little has hitherto been said concerning the wealth of India. *Prima facie* a country must be wealthy which sustains, without the aid of a poor law, two hundred and fifty millions of the human race. Moreover, a country possessing only a million and a half square miles of territory, and having the ability to support thereupon 20 per cent of the estimated population of the entire world, cannot be otherwise than wealthy. To those who hold fewness of wants, and not extent of possessions, constitute wealth, from such a standpoint India is indeed wealthy. A country which annually receives and pays for, from 20 to 30 per cent of the entire production of the precious metals, and which, in addition to this large absorption,† imports in increasing quantities articles of luxury such as precious stones, spices, corals,‡ &c., cannot by any stretch of the imagination, be considered as becoming gradually poorer.

Judging from the extent of her national debt, India may be said to be wealthy; for, although large, it is balanced by revenue-earning assets, equal in the opinion of many, to the amount of the debt. This is all the more extraordinary when it is considered that India has paid for every farthing of her conquest—that she continues to pay for an expensive military occupation, that she has borne the expense of many fruitless frontier wars (notably the Afghan war, which cost about twenty-four millions sterling), and that she has assisted the United Kingdom, in some of her military

* The Wealth of India and the Hindrances to its Increase; by William Birkmyre, of Calcutta and Port Glasgow. Glasgow: M'Naughtan & Sinclair, 24 West Nile Street.

† Quanborough's "Primer on Commercial and Economic Education," page 26.

‡ Barbour on "Bi-metallism," page 14.

enterprises. Moreover, when we think of the great pecuniary loss which famines have entailed upon the country, and the unbusiness-like—I had almost said stupid—methods by which she has acquired her assets, when in spite of all these ordeals, the country has emerged from them, almost free of a national debt, it is surely a proof, if not of wealth, yet of an elasticity of resource (with the exception of America) unparalleled in the history of any other country.

That India, in common with other countries, is afflicted with much poverty cannot for one moment be denied. There, as elsewhere, there are, alas, too many who fall in their strife with fortune. It is easy to paint a dismal picture of the poverty of a nation, but to solve the problem is a different matter. I often think it would be well for India, were her officials to devote more of their energies in ameliorating a condition, which India shares in common with every wealthy country, instead of dwelling constantly, in season and out of season, upon her so-called poverty. On the other hand, one cannot but respect the opinion of those, however mistaken, who are profoundly impressed with the poverty of India, and who ascribe this poverty to the expensive foreign organizations which we have imposed upon her. There is no doubt much truth in the contention that the civil and military services might be conducted upon a more economical basis: this may be said of all countries. The hardship with India lies in the fact, that those services are conducted principally by foreigners, and are, necessarily, more expensive. Still, in the face of all this, the broad fact remains, that judged by large and comprehensive issues, such as the increasing consumption of luxuries, &c., &c., India is not a country bleeding to death, as some would have us believe. Were this so, the process has been going on for upwards of two hundred years; and the evidence at which I have bad time merely to hint, all points in the direction of increasing wealth.

* * * * *

At the outset I said, that with one exception, India had in abundance everything which constitutes the wealth of the United Kingdom. The exception I referred to is the weak executive ability of the race; it is this principle, this ever present characteristic, which in my humble opinion is the main hindrance to the development of the wealth of India. The Indian people are admirable administrators, exact copyists, when placed in a groove; but they are lacking in the self-adaptive faculty of suiting themselves to the ever changing requirements of new developments. The individual has his place fixed for him in society by the rigours of caste, and thus his individuality is lost in that of the community, which in its turn is lost in looking to Government. There is a want of self-reliance, of that bold and sturdy spirit which leads individuals and communities to lean upon themselves, rather than upon those who govern them; hence, as stated, the weak executive ability of the race is the main hindrance to the creation of wealth in India. This may be illustrated by the fact that upon our acquiring the country we found it all but destitute of roads, by which the inhabitants could communicate with each other. They were practically shut off from selling to themselves, or to the world, the fruits of their labours; in consequence of their weak executive ability they were unable to appreciate the necessity for roads, so as to give their wealth-creating faculty full scope. Hence, also, the hoarding propensities of the race, and their inability as a nation to associate capital, or to combine and organize themselves as one against an enemy.

The paramount power in India is, and has always been, the centre from which all social and public works emanate. The people look to the Government to see everything, know and provide everything, whereas with the strong executive faculty of the Western races they are themselves the centre, and the Government is but the organ of their wishes.

The good qualities of the Indian people—their patience, their courtesy, their contentment—all serve to accentuate their weak executive ability. In their religion, there is nothing like what we understand by dissent, nor is there the ever restless ingenuity to discover new and improved methods, so typical of Western races.

It is easy to criticise, but not so easy to suggest a remedy. As has been well observed, "You may alter the conditions of the race but never their characteristics." So in the case before us, I fear a remedy is impossible, and to defer the developement of the wealth of India until this national weakness is overcome is simply postponing indefinitely all measures for the promotion of its growth. Nor is it necessary in this instance that we should make the the attempt to alter this characteristic, for have we not as a nation, assumed the executive of India? We have assumed the trusteeship of the people, and no country has ever taken upon itself such responsibilities to another as England has towards India. If India has suffered since our possession, for want of proper communications with which to develop her resources, the fault clearly lies with the Executive which we have imposed upon the country, and if we desire India to become wealthy, and to take her place among progressive nations, it is upon this Executive that our attention must be concentrated.

I have attempted to show you wherein the wealth of India consists—namely, in her wealth creating faculty applied to a marvellous number and variety of products. I have tried to interpret to you a few of the national characteristics of the race, the chief one being an innate desire to better their condition. I have endeavoured to show you wherein mainly consists the hindrances to the country becoming wealthy—namely, the weak executive faculty of the people and the feeble Executive which the House of Commons has given to the country. I fear things cannot improve unless this country can be roused to take a more active interest in the affairs of India.

When one thinks of the millions of families in this country, who receive their daily bread in virtue of our connection with India, and how, were the inhabitants of this country, but to take a greater interest in the affairs of India, the number of these families could be indefinitely increased—when one thinks of the millions of the Indian race who receive their daily bread in virtue of our connection with their country, and how, by a more active interess on our part in its affairs, their number could be largely increased. In meditating over these things and the apathy of this country towards India, I am sometimes inclined to estimate such neglect as almost criminal. India ought to be considered as an integral portion of this Empire. It was so viewed a few years ago when Russia threatened her frontier. With how much more reason should it be so regarded in relation to all those peaceable economic questions, common to all progressive countries.

[There is another side to parliamentary interference with India. For instance: Bradlaugh representing as a martyr of tyranny the Maharaja of Kashmir, who was deposed because of his tyranny and oppression. There is another side also to the character of the administrators of India. There are exceptions, of course, but on the whole no conquered people were ever more ably, righteously and benevolently governed than the people of India.—ED. *T. A.*]

GARDENING IN INDIA.

There seems to be a prevalent idea among those who have not been to the tropics, and especially India, that gardening there must be a very simple affair, just in the same way as some imagine that tigers prowl about the streets, and cobras meet you at every turn; but the reverse is actually the case: good gardens, like tigers, are, in fact, not plentiful, and it is possible to live in India a long time without ever seeing a cobra outside a snake-charmer's basket.

Before I went to India, I had similar erroneous notions, particularly as regards Indian vegetation. I fancied I was going to see a Kew Palm-house-like aspect everywhere; mighty Palms, and rampant climbers; in short, just like the choice "bits" of jungle scenery that travellers in the tropics are wont

to beguile us by pen and pencil. It is true that when we entered Bombay's magnificent harbour at sunrise, and I saw the towering groves of Palmyras (Borassus flabelliformis), that stand like giant sentinels on the amphitheatre of hills overlooking the harbour, I began to think that the dream of my life of seeing a tropical jungle would soon be realised. The same day I visited the Victoria Gardens and others among the principal gardens of Bombay, and I was enchanted with all I saw, for though it was November, the gardens were at their climax of beauty; their spring-tide of flower, in fact, after the monsoon, as the long rainy season is termed.

I think it is pardonable in a young gardener if, on first seeing a tropical garden, he goes wild with delight, and otherwise shows signs of temporary insanity. I have a distinct recollection of being in that condition when I entered the Victoria gardens in Bombay, and saw growing in the greatest luxuriance in the open air plants that from childhood I had been accustomed to see cribbed in pot, and confined in a glass-house. So great is the difference between pot-grown plants in a stove and those growing in unrestrained vigor in the tropics, that they are often scarcely recognisable, and I blushed at my ignorance when, on asking the names of certain plants, Mr. Carstenson, the Curator, mentioned the most familiar names. The things that struck me most were such well-known stove climbers as Bougainvilleas, Bignonias, Allamandas, Ipomœas, Passifloras, which send their lissom shoots from tree to tree just as the Traveller's Joy and Honeysuckles do in our hedgerows, and the brilliant colour they give to an Indian garden scene is quite indescribable—it must be seen to be understood. The groves of tall Palms give support to shade-loving Bhilodendrons and other clinging Aroids, and in the shade below grows a multitude of smaller things—Pancratiums, Crinums, Alocasias, various Bromeliads, Begonias, and suchlike, while there is a dense lawn-like carpet of the creeping little Artillery plant, Pilea muscosa, or whatever its latest name may be. I could not better describe the Palm grove than by comparing it with the central part of the Palm-house at Kew, supposing the roof was away, and the big Palms spaced out more widely.

What we term "fine-foliage" plants are no less remarkable, especially the higher-coloured shrubs, like Croton, Acalypha, Caladium, Dracæna; for there they develop such rich tints, especially the Crotons, that even the famous Liverpool Croton growers could not approach. I saw a shrubbery of Crotons—a hundred or more—planted in the full sun, close to a wall at one of the railway stations; and I thought I had never seen such a marvellous sight in the way of leaf-colour; and the sorts included most of the newest—all dense, symmetrically grown specimens.

I thought of Mr. Baines and his famous "elephant" specimens, the result of years of patient skill, when I saw in a sample forecourt in the Bombay suburbs some gigantic specimens, faultless in training, and crowded with bloom, of Ixoras, Jasminum sambac, Bignonia venusta, Bougainvillea leteritia, Petrea volubilis, and others. The owner, a railway man from Lancashire, seemed unaware that he was doing anything very remarkable; he liked flowers, and liked to see the front garden "look a bit smart."

It is not only in the Victoria Gardens that one sees such luxuriant vegetation, but you see it everywhere—in the city gardens, of which the Elphinstone Circle Garden is a noteworthy example; in the Fort where European commercial life is carried on; as well as on the picturesque height known as Malabar Hill where the wealthy natives as well as Europeans have their bungalows, and, in most instances, beautiful gardens about them; but all this is due to the perpetually moist atmosphere and high temperature that prevails throughout the year, so that when you leave the sea-girt island of Bombay and its Coco-nut woods, you enter upon quite different scenery whichever direction you take. Going south towards Madras, you have to climb the ghauts, as the western range of mountains are called, and there you see Nature's gardening in its grandeur, until you reach Poonah, and beyond that city you pass through the trackless wastes of the Deccan. Going up country towards Guzerat, the train takes you through a marvellously rich Agricultural country, where the fields of Cotton and cereals are measured by the square mile. On towards Baroda, you come to what is aptly called the "garden of India," where the rich farm lands are interspersed with magnificent timber trees, where the Tamarind and the Mango give a distinctive feature to the landscape, diversified now and again by natural groves of the Toddy Palm (Phœnix sylvestris) and Palmyras, and this kind of scenery goes on in a more or less varied way right through the vast stretches on to the Punjaub and the North West.

It is thus that the stranger derives his first impressions of India, and if he enters it by the other great gateway, the opening scene is even more impressive as he goes 100 miles up the Hooghly before reaching Calcutta. The banks of the Hooghly are typical of an Indian jungle, abounding in vegetation of the wildest description, and where the tiger, moreover, is not a stranger.

The further you go inland the less tropical the vegetation becomes, and the more difficult it is to make and maintain gardens, and the difficulties attending gardening, in the sense that we understand the term, accounts for the comparative rarity of fine examples. These difficulties arise purely from climatic causes, the long period of drought and the excessive rainfall spread over a comparatively short period. It is, indeed, not an easy matter to maintain an inland garden in freshness from one monsoon to another, which interval varies from eight to nine months. But by the ordinary native system of irrigation, much may be done; and those who can afford a more costly system, can keep their lawns green throughout the year.

As regards the subject-matter of these discursive notes of gardening in India, I think it best to divide it, as methodical London did in his *Encyclopædia of Gardening*, where he treats on the state of gardening in different countries. His divisions are—gardening as an art of taste and design, and gardening as an art of culture. As regards India, so far as my scant knowledge goes, there is very little to say about one, and a great deal, more than I can go into here, about the other. About the gardens I saw, the majority exemplified very little design, and the tasteful bits resulted more from accident than design. Europeans unquestionably are leaving their marks everywhere about the country in the matter of gardens, as well as on the buildings, and everything else; but the want of intimate knowledge of the principles of design are too apparent. The fact is, that in India, as indeed in this country, too, everybody thinks that he can lay out a garden, a simple matter say they, what is there in it? The results too often show that there is a good deal in it. But in India this is more excusable, because professional gardeners are scarce, and very rarely you find a native capable of designing even a flower plot well. Consequently, you get the military officer or the civil servant with spare time, essaying to do what he knows very little about; but for that matter he would build you a steam-engine or make a fiddle, for a man in India must be more or less a "Jack-of-all-trades." I heard of a German out there who qualified himself for a landscape gardener by being an expert at house-decorating, and sure enough he transferred his elegant scrolls and aimless contortions to the walks and roads of a public garden he designed. Among the gardens that stand out prominently as fine examples, are the great public gardens of Calcutta and Bombay, the botanical garden in the former place being probably the finest in the world; while remarkable also are the Government House gardens at Barrackpore, and the picturesque Eden Gardens. Those in the Nilgherries at Ootocamund and Bangalore, favoured as they are by a delightful mountain climate, are highly spoken of by everyone who has seen them. The gardens at Poonah, which, like the other great centres has been long under the influence of the British, are famous throughout India, for the climate there favours the growth of plants that will not thrive in the plains. I was much

pleased with the Government House garden at Ganesh Khind, which were for many years under the management of an old Kew student, Mr. Woodrow, now Professor of Botany at the College of Science. The Bund garden, too, struck me much, both on account of its design—a series of terraces—and for the high keeping of it by a native superintendent.

At one time the best gardens were confined to British territory, but in future we shall have to go to the native States for fine gardens. Already great progress has been made, doubtless the outcome of the periodical visits to Europe of the native princes, who have seen for themselves what English gardening is. Among States that can boast of famous gardens is Oodeypore, under the direction of Mr. Storey, who has, I hear, done wonders in making the State gardens there what they are now. I have not yet seen them, but a friend who has travelled throughout India tells me that they are really fine, enriched by magnificent tree growth, and embellished in a costly yet tasteful way. I am told that the lakes alone are worth the 70 miles ride on camelback to see, being of great extent, and have delightful surroundings. The view in the Oodeypore Gardens (see Supplement in present issue) shows a fountain of simple yet massive design; and doubtless Mr. Storey has it full of Water Lilies, that give such a charm to water basins in India. The trees in the back ground are Tamarinds, which are among the finest trees in India, as stately and massive as an Oak, yet as graceful as an Acacia. I have measured some with boles 27 feet in circumference. Noteworthy gardens in other States include that of Jeypoor, over 70 acres in extent, designed by Dr. De Fabeck; Durbuugha, which was at one time under the direction of Mr. Maries, but who is now, I hear, doing a great deal in gardening at Gwalior, also a native State. There are also fine gardens at Patiala and Chikalda, while I hope that the various palace gardens and parks that I am designing and laying out for H. H. the Gaekwar of Baroda will in time compare with any in India. I have said nothing about native gardens pure and simple. Judging from what I have seen, there is very little to say about their design; the native idea of a garden is a square plot with his bungalow in the centre of it. The plot varies in extent according to the importance of its owner, but there is no variation from the straight lines and symmetrical figures he delights to portray on the ground. After the diamonds, squares, and trapezoids are cut out and duly edged, he proceeds to plant them with masses of the things he most requires; but the stock things are Limes, Guavas, and such like fruits, and with flowers like Jasmine and Roses, of which a prodigious quantity are required for religious festivals and ceremonies. But there is a good deal of commonsense in all this, for a garden so laid out is easily irrigated and kept in good order. He is not troubled about æsthetics, "breadth of effect," or "picturesque skylines." A garden to him is a place to grow things to eat, or use in some way, and that is all that he wants. In the unregenerated gardens around the palaces, you see much that is absurd according to our canons of taste, but invariably there are fountains, often of beautiful design; but as a rule, out of all proportion as regards size to extent of the garden. I think it was Bishop Heber who said that the natives of India built like giants, and finished their work like jewellers, and this is true of their buildings; but in the matter of gardens they seem to be like pigmies, incapable of originating any broad design, which alone can set off to the fullest advantage their wonderful buildings.

Gardening in India, as an art of culture, is such a wide subject that I will not attempt it here. The methods of cultivation and propagation, which, though primitive, are often highly ingenious, and altogether I have a good opinion of the native mollee. He is skilful, and generally very painstaking, but it takes him some time to get into European ways of doing things. Mr. Woodrow, in his book, *Hints on Indian Gardening* deals with the practical part of gardening in a very thorough way, which cannot fail to influence the future condition of gardening in India.—W. GOLDRING.—*Gardeners' Chronicle.*

PLANTING OF TREES IN STREETS, from a sanitary point of view, cannot be over-estimated. Trees not only afford shade and shelter, but adorn the landscape and purify the air. They improve the heart as well as the taste; they refresh the body and enlighten the spirit, and the more refined the taste is, the more exquisite is the gratification that may be enjoyed from every leaf-building tree.—*South of India Observer.*

CARRIER PIGEONS.—An interesting experiment to test the utility of Pigeons is about to be made in Canada. Ten pairs of birds are being shipped to the Dominion this week, and then itention is to train them for the purpose of establishing and maintaining a line of communication between Sable Island and Halifax. Sable Island lies in the Atlantic Ocean, about 90 miles from Nova Scotia, and in the track of vessels passing between the American Continent and Europe. A station is maintained on the island with provisions and other necessaries for the relief of shipwrecked mariners, but there is no regular communication between it and the mainland. The experiment has been initiated, as likely to be of service in cases of emergency, by the Canadian Minister of Marine and Fisheries.—*H. and C. Mail.*

TEA IN CEYLON.—Mr. John Brown, of the Uva Coffee Company, is well pleased with all that he saw during his long tour in your island, where he travelled fully a thousand miles, having visited every tea district. He has great confidence in the capabilities of the Uva districts for the production of good tea; but, as regards quantity per acre, he believes that in all parts of the island the longer an estate has been under coffee cultivation the slower will be its progress to full bearing, and the less will be the annual yield, especially in those cases where a long course of mamoty-weeding has denuded an estate of most of its top-soil. There is reason in this opinion for, though it is true that tea is a deep feeder, which coffee is not, time must be allowed for the tea roots to make their way down to a good feeding soil, and of course the quality of that soil will always be a matter of uncertainty. Mr. Brown regards the fuel and timber questions as of serious import, and agrees that materials for packages should be imported, and that where water power exists in quantity it should be utilized as a motive-power for machinery. He is thoroughly well satisfied with the averages of his Company's teas, but on many of the old coffee places patience will be needed before ample yields are secured.—London Cor., local "Times."

TOBACCO IN INDIA is thus referred to in the Official Report on Inland Trade in 1888-89:—

This narcotic is widely cultivated by the agricultural population for domestic consumption and in most provinces for inland export also; but it is only in tracts possessing a moist hot climate and a rich soil that the finer varieties suitable for European consumption can be grown. Such conditions occur in the coast districts of Madras and Bengal: and it is from these tracts that most of the tobacco exported from the country (a small quantity) is obtained. The principal barrier against a larger trade lies in the ignorance of the natives of the art of curing the leaf. A sufficiently profitable market might be found for ordinary Indian tobacco if it were properly cured; but the manner in which the narcotic is usually consumed by the natives themselves does not encourage a knowledge of curing. It is either chewed as a dry powder mixed with lime, or smoked in the form of a conserve or paste mixed with treacle and other ingredients. In either case pungency rather than aroma or delicacy of flavour is the chief desideratum. The best prospect of improvement in Indian tobacco manufactures lies in the steadily increasing consumption among the richer classes of natives as well as the European population, of the country cheroot and pipe tobacco. Measures are being taken to introduce a knowledge of American methods of curing in Madras, and the cigars of that Presidency are gaining in reputation. The area cultivated with tobacco in all India is put down at 800,000 acres; the crop at 406,000 tons, or over ½ ton per acre.

THE PROSPECTS OF QUININE AND CINCHONA BARK.

The figures we published a few weeks ago indicating the steadily increasing exports of cinchona bark from Java, created a very unfavourable impression locally and not a few have been heard to say that there is little use now in anticipating better times or a better price for bark. Without doubt Java is fast assuming the position lately held by Ceylon as arbiter and controller of the bark market. Her richer barks, averaging double those of Ceylon in quinine, are now being shipped to the extent of from five to six million lb. per annum. And if we are to believe our latest visitor, Dr Wilson, there is no prospect of her export felling off for a good many years to come. At the same time, it is quite a question whether the total supply of Bark for the next few years will be equal to the World's demand, unless prices rise sufficiently to warrant the harvesting of bark from indigenous trees in South American forests. The exports from Ceylon are unmistakably falling back year by year; those of India are at best stationary—indeed they have also lately fallen off. Wild bark from America has ceased to come toward save in the better alisayas, apart from the Belivian bark from cultivated trees The total result therefore even making allowance for an increase of Java bark is far from discouraging to cinchona planters. Supposing that Java this year supplies 5¾ million lb. 4 per cent bark, Ceylon 7½ million lb. of 2½ per cent, and India 1½ million lb. of 2 per cent bark, we only get the equivalent of 7¼ million ounces of quinine, while the consumption is likely to be in excess beyond what the American bark can make up, not counting the quantity of bark required for other purposes than quinine.

As regards consumption, Mr. John Hamilton in 1888 estimated that 9 million ounces would be required in 1892, the demand increasing annually by 10 per cent. But last year's experience—owing a good deal to the influenza epidemic and the cheapness of quinine—showed an advance much beyond the estimate. The United States last year increased her imports largely; the figures being for 1888 imports 1,904,206 oz.: 1889=2,245,941 oz., while five months of 1890 saw an import of 1,611,000 oz., or at the rate of at least 3,200,000 oz. for the year. All this apart from over a million ounces manufactured annually at Philadelphia. With the world's consumption at 9 million oz *next year* (in place of in 1892), we cannot see where the bark is to come from for more than 7¾ million oz., unless the price per unit goes up considerably. We believe there is a general impression that before the end of this year there will be a considerable change for the better, and although with Java overshadowing us, there is no room for "great expectations" being encouraged among the Ceylon bark holders, still we cannot but think that at least a better time is approaching and that we have touched the lowest depth in quotations.

So far our view of the near future's on the basis of the laws of supply and demand and a normal market. But what are we to say if the following story published in the *Chemist and Druggist* be correct? It contains, at any rate, a very curious revelation. The contracts referred to are, of course, perfectly legitimate, but undoubtedly the system is one-sided and enables the manufacturer to say, in effect, to the producer:—"Heads I win; tails you lose." The question is, Can any number of the Java cinchona planters have lent themselves to such one sided and damaging contracts? We quote as follows:—

QUININE MANUFACTORIES DEPRECIATING QUININE.

Mr. H. A. Van Overzee, jun., cinchona broker, of Amsterdam, sends us the following notes on the subject of the depression in the price of cinchona bark.

Some years ago, when the Amsterdam market began to gain importance, there were many who prophesied that the average percentage of quinine in the Java barks would become so high (10 to 12 per cent) that one was inclined to question the possibility of placing such quantities of quinine as those barks would yield.

Since then the imports from Java of Ledgers and Hybrids—which two kinds were predicted to be the barks of the future—have shown us that these expectations were greatly exaggerated.

The following quantities of Ledgers and Hybrids have been offered in Amsterdam at the regular auctions.

			kilos.		p. c.
1888	at 10	auctions about	1,131,000	averaging	4 02
1889	,,	,,	1,688,400	,,	4·12
1890	5	,,	1,220,302	,,	4·20

It is true that some plantations have not stripped as much rich stem and root bark, as they would have done if the unit value had ranged higher—still the above figures show clearly that the fear of overproduction through the increasing richness of the barks is unfounded.

The stock of cinchona is London, according to the official accounts has declined from 99,600 packages in 1883 to 57,181 packages in 1889.

The stock in Amsterdam in first hands only consists of a few parcels withdrawn from the last sales, whilst in second hands there are never any supplies of any importance. Comparing the stock of cinchona with price of quinine, as follows:—

	1883	1884	1885	1886
London bark stock (per kilo.)	99,600	80,500	61,700	62,350
Quinine (florins per kilo.)	135	75	57	24

	1887	1888	1889
London bark stock (per kilo)	59,619	56,754	57,181
Quinine (florins per kilo)	36½	27½	25½

it is evident that some powerful factor must have operated to produce the constant decline of the price of the manufactured product, concurrently with the diminution of the supply of the raw material. What is this factor? I am inclined to think that it is found in the existence of contracts for cinchona between some large plantations in Java and quinine manufacturers direct, in which the price of bark is fixed only upon arrival of the parcels in the factories, according to the then ruling value of quinine.

Such contracts may seem profitable to some planters, as the producer receives the quinine-value of his barks without any expense except the remuneration of a specialist (who, in conjunction with the quinine manufacturer, adjusts the percentage and value of the bark on arrival), taking into consideration a certain fixed figure for the cost of manufacturing. The planters, as a body, may be sure, however, that by such a mode of operation they are digging their own graves, for this reason—such contracts enable the manufacturer to sell considerable quantities of quinine for future delivery at low prices, without loss or even without risk, because he has the guarantee that however low may be the price at which he sells the quinine, when delivery time comes the necessary quantity of bark will be at his disposal at a correspondingly low figure.

The depreciation in value of quinine is thus actually borne by the planters, yet it is a fact that such a contract exists between a German manufacturer and Java planters, and that this has enabled him for years to sell quinine on future delivery with a profit at the lowest figures, causing at the same time a general depression of the article, to the detriment of the producers. Whenever this manufacturer lowers his prices, other makers have to follow suit, should they not wish to lose their customers, and they have therefore to make

lower bids in the bark auctions where their sales are covered.

It is known that this manufacturer receives every year, under such conditions, cinchona bark with an equivalent in quinine of some 8,000 to 10,000 kilos. (280,000 to 350,000 oz.)—a quantity amply sufficient at all times to bring about any desired fall in price. In January, 1889, when London quoted quinine at 1s 3d with a slow demand, this manufacturer could sell "future delivery" at 1s 2d without the slightest danger of being caught by an eventual rise in bark values, being certain of receiving direct from Java the necessary quantity of cinchona to cover his sales. As soon as the price of 1s 2d became known, buyers would not hear of any higher figure, and other manufacturers had to follow suit if they wished to have any chance of doing business. The consequence was that in the following bark sales no more could be paid than the equivalent of a quinine price of 1s 2d for the barks; the unit in London was thereby reduced from 1-⅞d. in Jan. to 1½d in the following month.

When, after this, in February, sales of quinine at 1s 2d were not so easily accomplished, future delivery was again lowered to 1s 1½d which other manufacturers had to concede, and a further depression of bark values was the result. It was not till some manufacturers paid higher prices for bark to sustain the market that manœuvring was put a stop to, and it became possible to effect a slight improvement.

The holders of ba k may try what they like to keep the markets free from abnormal pressure, by judiciously regulating the quantities to be exported: they will always be out done by the power of manufacturers who hold contracts as described above. It is evident that the bark statistics give no reason whatever for a position such as exists at present, and it is only the finessing of a few manufacturers which since 1883 has driven down the prices of quinine and the value of cinchona to the loss of the planters, whose care it should be to render such things impossible for the future. In the long run, a sound state of affairs can only be brought about by free competition, which under present circumstances cannot possibly exist

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OTTERS AGAIN:

Tobacco Smoke *v.* Hounds, &c. &c.

Nuwara Eliya, June 30th.

The graphic reminiscence of an orthodox *otter hunt* in the *Observer* of the 26th inst. was interesting. The "tailing" of the otter at the ford, however, and the throwing him on to the bank, to be torn to pieces by perhaps some 10 or 15 couple of hounds, savours to me uncommonly like foul play. Why! "*tobacco smoke and brimstone*" could not be much worse than this, though far be it from me to defend such a mean device for the destruction of an animal which affords such excellent sport.

I have been familiar with *otters* and *otter hunting* from my boyhood, and in this connection I can't help relating, how I once closed with one whilst a *barley rick* or *stack* was being removed, and which notes I am sure will bring to the memory of many of your readers some similar scenes of boyhood days. 'T was on a winter's frosty morn, when several inches of snow lay on the ground, and I had just been round my rabbit hutches feeding my pets on green kailand carrots, and admiring the last litter of beauties, nestling in their cosy bed of fur. The sparrows and finches, half tamed with cold and hunger, were hopping about all around on the crisp white snow, and robinredbreast was begging in sweet low notes for his morning repast of crumbs. Looking towards the stable yard, I see James Johnstone (a fine specimen, by the way, of the old proverbial minister's man, so well described by Dean Ramsay), and Davie the "loon," yoking the horse to the cart. The barn-door opens, and the forks are got out. Hurrah! thinks I, they are going to take in a stack of barley or oats, a rare occasion of rejoicing with Snap the terrier and myself. The news spreads, and some of the boys from the village collect for the *rat* hunt. Sheaf after sheaf is forked into the cart in quick time, and as the stack goes down, down come the rats, to be caught in our hands, as the cricket ball is caught by the wicket-keeper.

A squash and a dash on the ground, and the varmint is no more; an occasional bite is nothing; that only adds zest to the sport.

But see—the rick is getting lower, and it is not *rats* alone that frequent the stacks, for a home or a shelter. At times, weasels, stoats, otters, and semi-wild cats, &c., find snug retreats there. Snap and I as usual take up our station at the ventilating flue of the stack all attention and ready for any comer. Out bolts a great brown thing, right bang on to my chest; Snap has him by the ear, and I by the throat—over we go—heels over head—down the slope—a bundle of dog, otter and humanity, James Johnstone bawling out from the rick "Haud laddie, haud, if ever ye haud i' y'r life." And faith the "haudin o' 't," is rough and tough work!

But Davie, my staunch henchman, is off the cart and down the incline like a lamplighter. Just as I am pretty well out of breath Davie collars him by the scruff of the neck and plants his knees over the chest of the otter. I follow suit, and get on behind with all my weight. You may rest assured it did not take us 3 hours to polish off our otter! I should say we had him carried into the back kitchen, within 15 minutes from the bolt, and where we had our wounds dressed. But what cared we for bites or bruises, wounds and contusions? Davie and I had the stomachs of cassowaries in those days, no such things as nerves I believe, and stout hearts. Davie went to Canada and prospered there, and, if still above the sod, will no doubt remember as well as I do the tussle we had with the "water d og."

Now, Mr. Editor, this is what I call legitimate otter hunting—no tobacco smoke or brimstone here; no pulling of a poor half-winded thing on to the bank of the stream to be torn to pieces by a pack of strong hounds!

By all means, as you suggest, let us go at the otters in an orthodox way. We have got the men, and there is no great difficulty in getting the dogs. How many right worthy successors of Palliser, Downall, and Baker have we not got all around us? One of the new improvements or attractions to Nuwara Eliya, our lovely Sanatorium, will undoubtedly be the *pack of otter hounds*, and, if spared, we hope to read the announcement:—"Otter hounds will meet at the Bridge, Rosebank, 5 a.m., 1st Jan. 1891."

Decrease in Cane Sugar.—The *Grocer* in calling attention to the decrease in the supply of cane sugar, says:—The principal feature in the existing supply of sugar in this country now is the diminished imports of cane as distinguished from beet descriptions, as, whilst consignments of the latter predominate to a greater extent than ever before, arrivals of the former have been lighter up to the present period of the year than they have been for many seasons past. It is years since the London market was well supplied with sugar from the East Indies, consisting of various useful kinds suitable either to grocers or refiners, when public sales of Mauritius, Bengal, and Penang were regularly held, and passed off with readiness at better prices duty paid than they would now entirely free of a customs' charge if any of the same sugars were to be offered.—*H. & C. Mail*, June 6th.

REMARKS ON THE STATE OF BOTANY IN CEYLON.

WITH REFERENCE TO THE KNOWLEDGE OF IT IN APRIL 1843, AND AN ATTEMPT AT ARRANGING ITS FLORA AS KNOWN TO MOON AND RESIDENT BOTANISTS ACCORDING TO LOCALITY AND ELEVATION, COMMONLY CALLED GEOGRAPHICAL DISTRIBUTION OF A FLORA.

By Captain Champion, 95th Regt.

GEOGRAPHICAL DIVISION OF PLANTS IN CEYLON.

(*Continued from page 112.*)

Table 4th.

GENERAL FEATURES OF CEYLON VEGETATION.

Capping the Hills, facing Kandy and Peradenia. The Flora of Table 3rd is intermixed with:

1st. On the under features and lower Hills about 1,900 feet.

Memecylon Sp. Eugenia Sp. Cyminosma pedunculata, Mezoneurum cucullatum, Holigarna Sp. Litsæa trlnervia, Solanum verbascifolium, Solandra oppositifolia, Cerbera parvifolia, Strychnos Sp. Tylophora panciflora and Sp. Carissa carandas, Zizyphus Sp. Artabotrys odoratissimus, Miliusia Indica, Annona Asiatica, Gyrinops Sp. Pothos gracilis, Cæsalpinia paniculata, Epidendron pendulum, Wendlandia Notoniana, Heyneana, Exserta, Bicuspidata, Stylocoryne densiflora, Tradescantia paniculata, Achimenes sesamoides (Wild.) Torenia asiatica, Rosca santaloides, Rubia cordifolia.

2nd Slopes of the highest hills, about 3,000 feet above the level of the Sea.

Rubiaceæ, many good Sp. Grumilea vaginans, Psychotria curviflora, and 2 other Sp. Anonaceæ Sp. Myristica Iriya (Moon) Clypea hernandifolia, Xanthochymus ovalifolius, Rhus decipiens, Convolvulaceæ Sp. Begonia Malabarica (red & wh. fld.) Martynia lanceolata, Didymocarpus Sp. Solanum decemdentatum, Ferox, Giganteum, Curculigo pauciflora, Arum pentaphyllum, Huge forest trees (Echinocarpus?) Ternströmiaceæ? Caryota horrida. Ammannia Sp. Elæagnus latifolia, Cissampelus Sp. Dianella nemorosa and graminifolia, Asparagus falcatus, Smilax latifolia, Arum campanulatum, many tree Orchidaceæ, Filices and Lycopodii, Limodorum Sp. The Wana Rajah, Pavetta hispidula (W. & A.) Maba buxifolia, Convolvulus Learii, Ophiorhiza tomentosa (Roxb.) The Nilla (Plectranthus Sp. stunted Impatiens 2d Sp. Geophila reniformis, Hedyotis Leschenaultiana, Acrotrema Sp. Boragineæ Sp. Arum 2d Sp. Gymnopetalum Sp. Nauclea cordifolia, Æginetia bicolor, Vernonia Sp. Capparis grandis, Medinilla Sp.? Curcuma 2d Sp. Zingiber cylindricum, Alpinia sericca, Malaxis Rheedii,? Sterculia guttata? Elæocarpus Sp. (entire leaves).

3rd, Grassy knolls on the flanks;

Are covered with Lemon grass—Careya arborea, and Phyllanthus Emblica (the only trees); intermixed are Impatiens oppositifolia, Gnaphalium Indicum, Hedysarum triquetrum, Cassia angustissima, Crotalaria anthylloides (var.) and Sp. (type of C. Hirsuta) Polygala Sp. Stemodia lutea? Tetranthera cauliflora? usually borders the jungle in such places.

4th, On the very summit of the highest hills.

Grassy knolls with masses of Osbeckia Sp. Hedyotis fruticosa, Vernonia?, Evergreen shrubs and trees with small leaves such as Eugenia Sp. Sethia Indica, Salacia Prinoides, creeping (Rawana's Broom) Rubiaceæ, Ardisia humilis, Ternstrœmiæ, Memecylon ramiflorum, Bambusa Sp. Solandra oppositifolia (both a tree and creeper)—The Nilla shrubby.

Table 5th.

Localities of some good plants as given by Moon

Saffragam.

Liriodendron (Sphenocarpus Wa.)liliifera, Begonia rupestris, Elæocarpus oblongus, Soymida febrifuga, Cluytia collina, Indigofera hirsuta, Ficus stipulata, Dorstenia radiata, Bassia latifolia, Ceropegia juncea, Curculigo recurvata, Areca dicksoni, Bambusa spinosa.

Wallasse.

Grewia tiliæfolia, Melia pumila, Acalypha betulina, Butea frondosa, Rottboellia, muricata.

Walapane.

Psoralea corylifolia, Knoxia corymbosa, Sycas circinalis.

Katragam.

Hugonia mystax, Pavonio zeylanica, Dichrostachys cinerea, Gyrocarpus Asiaticus, Acanthus Maderaspatensis.

Maturata.

Grislea tomentosa, Crotalaria tenuifolia, Alysicarpus monilifer ,Solanum giganteum.

Oowa.

Terminalia Chebula, Psidium pyriferum, Myrsut tomentosa, Viola hastata, Impatiens bigrandulosa, Pterocarpus marsupium, Andromeda flexuosa, Anagallis esculenta, Campanula zeylanica, Rubia secunda, Premna procumbens, Martynia nervosa, Dracontium pinnatifidum, Andropogon cymbarius, schœnanthus, Agrostis diandra, Cynodon ciliaris, Avena sativa, Hordeum vulgare, Triticum æstivum.

Doombera.

Jonesia pinnata, Galaxia tenuiflora, Desmodium gyrans.

Bentotte.

Mucuna gigantea.

Table 6th.

Flora of Nuwera-Ellia, July and August, 6,000 feet above the level of the Sea.

The Flora of Table 1. disappears.

1st, Marshes and Margin of the Nuwera Ellia River.

Exacum teres, Orchis 2d Sp. terrestrial, Neottia Sp. very like N. spiralis, Drosera peltata, Monotropa Sp.—Thalictrum glyphocarpum, (Meadow-rue) Ranuorculus 2d Sp. Rhinanthus Indicus, Butomus Sp. Xyris Indica, Gratiola Sp. Smithia blanda? Dipsacas inermis, (var) Roxb. Valeriana Hookeriana, Utricularia Sp.

2nd, Meadow lands.

Rhododendron nobile and its parasitical Loranthus, Campanula zeylanica? and 2 other Sp. (one tetrandious) Justicia repens? Bupleurum virgatum, Celsia Sp.? Tradescantia axillaris? Commelina nudiflora, Potentilla Kelliniana and Sp. Bidens Chinensis, Hypericum mysurense, Japonicum, Andromeda ovalifolia? Oxalis corniculata and Sp. Polygala Sp. Viola mysurense, Serpens Euphorbia Sp. Cynoglossum decurrens, Piper Sp. Crotalaria anthylloides and Sp. Vernonia Sp.? Sida rhomboidea? Ruta angustifolia, Arum pentaphyllum, Thunbergia fragrans, Lobelia excelsa, Lysimachia 2nd Sp. Hedyotis fruticosa and Sp. Anemone dubia, Exacum sulcatum? (var, wh. and light blue fld) Alchemilla Sp. (Lady's mantle), Galium asperifolium, Osbeckia truncata, Gnaphalium, Indicum, Aristatum, Neilgherryanum, Æchmandra rostrata, Eupatorium zeylanicum, Physalis flexuosa, Parochetus major.

3rd, Borders of the Jungle.

Berberis tinctoria (var), Ceropegia acuminata, Rubus rugosus, Lasiocarpus, Gowreephul, Photonia

Sp., Osbeckia Sp. Agapetes Sp. Crotalaria Sp. (type of C. Notonii) Crotalaria Sp. Euphorbia Sp. Hedyotideæ tree Sp. Phyllanthus Sp. Polygonum Sp.

4th, Jungle.

Undershrubbery of Nilla and a creeping Bamboo: also Curcuma Sp. Æginetia Sp. Polygonatum Sp.? (Solomon's seal) Solanum Indicum, Nigrum, Ferox Giganteum, Smilax Sp. Orchideæ, a handsome terrestrial Sp. Cerbera parviflora, Piper Sp. Toddalia aculeata, Ardisia humilis, Eugenia laurina? many Rubiaceæ and evergreen shrubs, Biophytum sensitivum, Forests of the Red and White Kino, Croton Moluccanum, the trees of the mountains of kandy and many unknown Sp. Magnificent Filices, Epiphytal Orchideæ, Hedychium angustifolium and flavum, Medinilla Sp. a creeper, Hedyotis Leschenaultiana, Geophila reniformis.

TABLE 7TH.

Flora of Adam's Peak—March Summit of the Peak.

Rhododendron Nobile, Hedychium flavum or coronarium, Gnaphalium hypoleucum, Utricularia Sp. Exacum sulcatum (Roxb)? (wh.) Valeriana hirsuta? Moon, Cynoglossum decurrens, Calyptranthes densiflora? (Arboreous) Orchis (N. E.) and Sp. Sinapis capsella, Viola serpens, Osbeckia truncata, Magnolia 1st. Sp. Lobelia excelsa, Sonerila 1st. Sp. Hedyotideæ Sp. (shrub.) Scutellaria Sp.

Lower down Cone.

Osbeckia buxifolia, Monocera Sp. Osbeckia Sp. N. E.) Sonerila 2nd, and 3rd, Sp. Scutellaria Indica.

From the Cave, over the lower features, Ambegammowa side.

Sonerila 3rd Sp. Ardisia humilis, Magnolia 2nd Sp. Dillenia dentata, Vaccineæ Sp. (white fld.) Begonia tenera, Impatiens biglandulosa? Moon.

Runs into the flora of the Kandyan Mountains.

From Moon's List.

Agrostis panicca, Impatiens serrata, Nauclea triflora. Martynia crenata.

TABLE 8TH.

Remarkable Plants, near the source of the Mahavillaganga.

Acrotrema costatum and Sp. Boragineæ—N. Gen ?
Plants of Table 4 and probably many other good ones—
Didymocarpus Sp.

TABLE 9TH.

Road from Kandy to Nuwera-Ellia.

The lower Kandyan vegetation to Gampolla; add Melastoma Malabathricum and Hedyotis fruticosa.. Vegetation of the lower Kandian hills towards Pusilawè add—Lobelia excelsa (river), Hedychium coronarium a ıı angustifolium.

Vegetation of Lemon grass tracts in Table 4 add, —Hopea zeylanica and Impatiens Balsamina and Sp.

Pusilawe to Ramboddah.

Burmannia disticha, Æginetia bicolor, Pedunculata, Physalis flexuosa, Gnaphalium Indicum? The rock plants of Table 4 abundant.

Bambera-gaha.

The lower Kandyan vegetation has entirely ceased —Palms and Plantains not found. Forests of evergreen shrubs with small coriaceous leaves, Undershrubbery of the Nilla add—

Myristica Iriya, Hernandia sonora, Callicarpa lanata, Croton Moluccanum still sparingly, Impatiens 4 Sp. Hedychium angustifolium Lobelia excelsa and Solanum giganteum very prominent in the vegetation, Bohmeria alienata, Mussænda frondosa, Rubiaceæ, Cynoglossum decurrens, Epiphytal Orchideæ, magnificent Forms.

To Nuwera-Ellia.

Medinilla? Sp. on trees, Impatiens 4 more p. Sone forming the undershbrubery (top of the Pass) Osbeckia Sp.

Runs into the vegetation of Table 6th.

MAY, 1843.

CINCHONA CULTURE IN CEYLON AND JAVA.

We have been a good deal surprised to see the following deliverance in a contemporary :—

"Cinchona is an unfailing resource, in respect to which we feel our pride touched whenever we think that Ceylon is beaten by our neighbours in Java, who have endured all our troubles and disappointments, but have risen superior to them, not, we think, by virtue or a better soil or climate, but by means of better methods of propagation and selection. The fact that these are as available to the planters of Ceylon as to those of Java causes us to chafe over the first and only defeat Ceylon men have suffered in their enterprise."

We believe we have the advantage of the writer in having visited Java and seen its cinchona culture, as also its deep, rich soil of volcanic origin. Of course the Dutch colony started with the advantage of having obtained by purchase from Ledger the very best species of cinchona, to which attention was directed by the researches of Moens and his experiments in grafting the delicate *C. ledgeriana* on the more robust *C. succirubra*. As time went on plants and seeds of *C. ledgeriana*, showing high analysis, became readily available in Java, and the culture spread. But we feel confident that, with all the circumstances mentioned in its favour, Java would not have so far excelled Ceylon in the culture of the cinchona richest in quinine, had not a suitable, rich, volcanic soil been available to the planters of the Netherlands Indian colony. In the matter of soil, it is only the part of candour and truth for us to confess that Java has, undoubtedly, the advantage over Ceylon, except, perhaps, in regard to some exceptional localities in our island. In climate, on the other hand, Java, which is in the corresponding latitude south which Ceylon occupies to the north of the equator it is quite true has no advantage over Ceylon. The case is rather the other way, for in Ceylon we know but little of the severe droughts with which Java planters have so frequently to contend. Insect pests, too, bear heavily on the Java planters. With us in Ceylon *helopeltis* has principally affected the cacao culture. We are not aware that this destructive juice-sucker has ever meddled with the leaves of our cinchonas; and only in a few isolated instances, and that not recently, has tea in Ceylon been affected by "mosquito blight." In Java, however, cinchonas suffer much occasionally from *helopeltis*, while on tea plantations the insect is even a greater curse than it is in India. We recorded what we saw on the occasion of our visit to Mr. Kerkhoven's estate at Sinagar in the end of 1881. The tea bushes had been cut down within a few inches of the ground, and still bevies of children were busy collecting masses of the destructive insects. This fact, and the exemption of tea in Ceylon from insect and fungoid pests, with the discouragement induced by the low prices of our bark, may account for the absorbing attention paid to tea and the comparative neglect of cinchona culture in our island. If the prospects of cinchona became more encouraging, we cannot doubt that the care and skill of our planters

would largely overcome such inferiority as exists in our soil of gneissic origin as compared with the volcanic soil of Java; but it would be wrong as well as absurd to contend that in soil suitable for the growth of the best species of cinchona Java has not a real advantage over Ceylon. It is the undoubted fact that she has.

PAPER LINING FOR TEA CHESTS.

An Assam planter writes:—"I see someone advertising *paper* for lining tea chests, instead of *lead*. A man in Darjeeling called Linbury (I think) patented this years ago. Mackinnon, Mackenzie and Company tried it on 'Sookim-barry,' but they found the glue a bother and gave it up. The other Ceylon patent, lead and paper combined, is *the* thing if it can be produced cheap enough."

GEMMING AND MINING.

We are glad to learn that the work begun by the Everton and Barra Company is being actively prosecuted. Mr. Baddalay has come on the *illan* in his Everton mines, while the Barra plumbago deposits are being elaborately developed and very fine samples of what seems to be large deposits have been valued at £12 a ton on the cart.

It will probably not be long before we hear of the Company for whom Mr. Barrington Brown reported. The London Syndicate has by no means lost heart, but is rather more interested in the work before them. They have secured by lease extensive plumbago lands and there can be no doubt of their Company being floated and work being commenced in Ceylon.

ARTIFICIAL PRECIOUS STONES.

We wonder if Mr. Charles Bryant, whom we assume to be the well-known mineralogist and jeweller, is quite as confident as in his letter, published in Monday's *Standard*, he proclaims himself to be. However sincere he may wish to be, we should doubt it a little. It was recently announcedf as most of our readers will have seen, that Mr. Greville Williams had actually made real emeralds out of the refuse of a gas retort, and could, if he thought it worth while, make other gems—not imitations, be it understood, but the real articls—with all the qualities by which experts usually test the genuineness of precious stones. That was rather a shock to the buyers of emeralds, and accordingly Mr. Bryant steps forward to say that the process costs a great deal more than a stone purchased from a jeweller would, and that experiments of the kind have during the greater part of this century been occasionally successful. As long ago as 1837, Gaudin the chemist produced artificial rubies; sapphires have been made repeatedly; the spinel ruby has been evolved in such perfection as to deceive the most experienced buyers; while even diamonds have been manufactured—if that is the right word—though in sizes too small to be of any practical value in commerce. Nevertheless, the market for precious stones has never been affected, and it will not be, Mr. Bryant thinks, by Mr. Greville Williams's very interesting experiments. That is true, and will doubtless be comforting to jewel-owners; but, as Mr. Bryant is much too clever a man not to perceive, it does not quite cover the whole case. Mr. Williams may not have solved the great problem, which is, of course, to produce precious stones by artificial means at a profitable rate; but surely every successful experiment is a step forward towards the realisation of the ideal? The usual course of inventions is for the man of science to discover a method, for the practical chemist or mechanician to apply it, and for the trader by gradual pressure to secure any needful reductions in the cost; and we do not know any reason why precious stones should escape the law which is at this moment, if we may believe prospectuses, operating in the case of the rarer metals, such as osmium. With all respect for Mr. Bryant, we should say, judging merely as outside observers, that the danger to jewel owners, though not pressing, was both real and considerable, and that a bad quarter of an hour was for them quite within the limits of possibility. They may suffer as landlords have done, and will probably make more fuss. They have rather a serious stake in the matter, too. No one, not even Mr. Bryant, would venture to offer a serious estimate of the value of all the precious stones in Europe and America—we purposely exclude the enormous quantities scatered over Asia, the "buckets of jewels," for instance, known to be in the possession of the Shah—but guessing by the light of the diamond statistics, a hundred millions sterling would be far too low a figure to assume. That is a large mass of property, and a great chemist who happened to understand mineralogy, and devoted himself for a few years to the manufacture of precious stones, might some fine morning run its value down to a quite unexpected degree. He would try, we dare say, to keep his processes secret, and would avail himself of the Patent Laws; but this is the nineteenth century, nothing remains secret long, patents do not last for ever, and the cost even of a premature panic in the jewel market would be represented by millions. We may be told that such a discovery is impossible, even by an Edison of mineralogy; but we should like to know more precisely why. The constituents of every precious stone are perfectly well known, and are all obtainable; and the writer in the *Standard* who points to the difficulty of ascertaining the exact proportions in which such constituents should be used, underrates the patience of scientific analysts. If they were at work on the subject with a great object, and with the sort of passion with which electricians and mechanicians are now working to overcome the last difficulties in the way of the electric motor, they would find the right formulas soon enough. Mr. Williams has found them, according to the *Standard*, for making emeralds, and there is nothing to make the manufacture of emeralds more easy than that of other stones. The only active agency wanted is transcendent heat, and the chemists and electricians between them are now, we fancy, in full possession of the means of producing that. We bow to experts at all times on their own subjects, but it is not clear to the lay mind why, as jewels are already made, they should not be made in quantities, or why the processes should be so enormously costly as they are invariably, and to our minds rather too eagerly, represented to be. Wherein lies this element of inordinate cost, if the process is once so well known that ordinary manufacturing chemists can venture to attempt it? We are inclined to think that the great obstacle is not that, but the idea that the manufacture of any precious stone must be useless, because if once it could be manufactured readily, its value would disappear. Nobody, it is supposed, would want made emeralds, any more than they would want those often really wonderful imitations which sometimes perplex even experienced jewellers. Now, is that fancy quite well founded?

The question is a curious one, for it involves a good deal of human nature. Is the value of a precious stone wholly dependent upon its rarity, and the consequent proof it affords that its owner is possessed of unusual wealth, or, at all events, of wealth which he can afford to waste? That is a nearly universal assumption, especially with those to whom wealth is in itself an offence, and it has this support at least, that many a woman who would despise pretence thinks, if she actually has the diamonds at her bankers', she may wear their copies in paste. We venture, nevertheless, to question its entire correctness. The enormous market price of precious stones, as compared with their bulk and utility, is no doubt due to their rarity, and the consequent gratification to vanity which their possession affords; but their whole value does not consist in that. The desire for them is provoked also by their inherent beauty, as of flowers gifted with an attribute of permanence, and possibly also by that instinctive taste for shining things which has made dewdrops strike all races as exquisitely beautiful—nobody ever paid for a dewdrop—and which, as many doctors know, rises in some men and women to a well-marked kind of insanity. Many kleptomaniacs can control themselves against their temptation so long as the coveted article does not glitter. No possible case of manufacture can make an eternal dewdrop other than beautiful, or take away the ruby's gift of setting off flesh, or dim the strange flash of the opal, so utterly unlike anything else that Nature has produced. [By-the-way, the reference to the opal may be a mistake, for the beauty of that jewel, being the result of Nature's failure and not of her success—for she can hardly have intended those hiatuses which yield the iridescence—may be wholly beyond even the ablest chemist's art.] The taste for jewels would be universal, if only the people ever thought of them as possibly procurable; and if they sank heavily in price, they would be universally worn, as, indeed, the cheaper jewels and the imitations are already. What would happen, we believe, therefore, if jewels became cheap, is that the rich would abandon them in their present form, which tends more and more to a costly simplicity,—the stones being, as it were, bared of all other ornament—and that whole populations would take them up, thus constituting them once more a great article of commerce. Every woman above the poorest would use the stones for ornament. It is Birmingham jewellery that would die, not the real article. The rich, moreover, would defend themselves by calling art to their aid, and we should see not only a wonderful improvement in goldsmiths' work, now often devoid of even a pretence of art-feeling, but a sudden and splendid revival of the art of the gem engraver, now so nearly dead. The ruby collar of the Marchioness would be almost as costly as ever, as a triumph of design and workmanship—even Socialists could hardly make the first designer in Europe use his gift with a willing heart for a pound a week—while diamonds would become with the women of the people what pearls used to be in some parts of Italy, ornaments with which it was almost indecorous, certainly quite bad form, on high occasions to dispense. The jewel trade would be destroyed as it is, and all jewel-owners would feel as if they had bought Irish land or the bonds of a repudiating State; but there would be a new jewel trade embracing entire populations. Plain people would be too wise for such folly? That is not quite so certain. Plain people now are very like the select people of a century ago, and it is the picked "classes" of earth, the first in wealth and taste and the means of enjoyment, who in all ages have admired the flash apparently so self-derived, though it is as much a reflection as if it came from a mirror, that makes the first beauty of precious stones. We do not believe that the enlightenment of mankind will alter the taste for them much—it has certainly not done it yet,—nor do we see why, when the Smith of tomorrow has been raised to the level of De Vere of today—a consummation still some way off—Smith's tastes and De Vere's should be so utterly unlike. The jewel trade will not die; but we do not feel quite so certain as Mr. Bryant apparently does, that it may not be totally transformed, to the pecuniary injury of present holders. Fortunately, if science should produce such a catastrophe—and since, though usually favourable to the capitalist, is not invariably so—the area of ruin and misery would be comparatively limited. Dealers now rich would be pauperised; but the mass of those who possess precious stones would lose only potential wealth. Their gems produce no interest, and if destroyed in value, would still in one way remain as valuable as they are now. They are only gold in the mine so long as they are locked up.—*Spectator.*

IMPORTATION OF ADULTERATED TEA.

A bill (H. R. 10,720) has been reported to the House of Representatives as substitute for H. R. bill 8,744. It is to amend the act entitled "An Act to prevent the importation of adulterated and spurious teas," approved March 2nd, 1883. The bill prohibits, after July 1st, 1891, "the importation of the article commercially known as 'tea dust' in seperate packages * * * and all 'tea dust' so imported shall be destroyed under the direction of the Collector of Customs." We will publish the full text of the bill in our next, it having been received too late for the present issue. —*American Grocer*, June 18th.

[We fear this will shut out genuine tea dst which is really wholesome and good tea.—ED. *T. A.*]

COCONUTS.—It must be gratifying news to coconut estate proprietors to note advices received by wire of coconut oil being quoted at £28·10 per ton, the price having been a long time at a standstill has £25. This, together with the fact that two mills preparing nuts for confectionery purposes utilize about 20,000 nuts per diem between them, must be considered good news by all those interested in coconuts. Tho shipping of husked and unhusked nuts seem to be steadily increasing, but in this particular line, owing either to ignorance or dishonesty of many entrusted with the choosing and buying of ripe nuts, complaints often reach the shippers of the bad quality of the nuts when they reach their destination. I see the Tamil member is utilizing the time when Council is not sitting to frequently visit his different allotments of coconut land in Western Province and to put on a spurt to work them up.

A VERY INTERESTING PAPER has been published in the Burma official *Gazette* from the Deputy Commissioner of Bhamo, Mr. G. W. Shaw, on the Myauk Kudoung division of Momeik, a tract some 50 miles long and 30 broad, unknown until the other day when our troops were acting against Kau Hlaing, a noted outlaw of those parts, and his following of Kachins, Shans and others. Mr. Shaw describes the tract as a mass of hills some 7,000 feet above sea-level. The only flat ground consists of elevated valleys found here and there between the hills. Rice is cultivated and a little tea. The tea, however, is said to be bitter and of small value, fetching only one-fifth the price of Taungbaing tea of the same kind. The people say they are sufficiently occupied with growing rice for home comsumption and have not time to look after improving their tea.—*Pioneer*, June 21st.

Patent Stone in Penang.—A Penang paper says: "We understand that the floor of the General Hospital has been recently laid with Indian patent stone by a representative of the Indian Patent Stone Co., Ld., of Calcutta. This new material, which is being largely used in India, is composed of iron slag mixed with a small quantity of cement, and is especially suitable for flooring purposes, having a smooth surface and being very hard and durable. Among its other advantages are its non-absorbent properties, which is so very desirable from a sanitary point of view."—*Indian Engineer*, July 5th.

The Height of an Olive Tree is usually twenty feet, but it is sometimes as high as fifty feet and it reaches an almost fabulous age. One lately destroyed at Beaulisu had a recorded age of five centuries and it was thirty-six feet in circumfsrenee. The olive tree is exceedingly prolific under cultivation; tho fruit yislds about 70 psr cent of its weight (exelusive of kernel) in oil. Italy is said to produce 33,000,000 and France 7,000,000 gallons of oil annually. The tree does not vegetate readily beyond 2,000 feet altitude or 45 degrees of latitude.—*South of India Observer.*

Ceylon Tea Used in the House of Commons.—Mrs. Florsnce Fenwick-Miller, writing in the *Illustrated London News* of 28th June, says:—

An interesting little pamphlet on the culture and preparation of tea has just been issued by the United Kingdom Tea Company, of 21, Mincing-lane, who have recently received the appointment of Teamen to H. R. H. the Prince of Wales. Incidentally it is mentioned in the pamphlet that tea as supplied to the House of Commons refreshment-room, a mixture of Ceylon and Darjeeling, can be had for no more than two shillings the pound. What a change from the prices within the memory of most of us, and yet more from those of a century ago! It is hard to realise how our ancestresses existed without that delightful beverage, which, as Mrs. Frank Leslio says, "the English woman regards as a panacea for all ills, from headache to heartache." Yet it is quite certain that when the same tea that we now get for two shillings was sixty shillings per pound, only millionaires could afford to have "a good cup" every afternoon.

Japanese Lacquer.—The wood nsed in Japan for lacquer work is a light coniferous oue known as *hinoki*, and is prepared to receive the lacquer in various ways. For inferior work it is covered with paper, but in the finer qualities of lacquer work paper is not used. The wood is first carefully smoothed, all joints and imperfections are filled, as with putty, with the raw tough lacquer mixed with rice paste, which soon hardens so that it can scarcely be cut with a knife. The whole, is then covered with a mixture of interior lacquer and coarse yellow powder, and is left a few days in the open air to dry, after which it is placed in a moist-air closet to harden. A hard, gritty suface is thus obtained for the next coat. The next process is to cover the whole with two evenly spread coats of lacquer mixed with a fine ochre powder, so as to get an even, smooth-grained surface for the subsequent work. This is rubbed down with a stone and the parts which are not to receive any decoration, are ready for the finishing application of the lacquer. The other parts are covered with two coats of black lacquer the first, applied with a broad brush, dries, with a brilliant, reflecting surface; when this is quite hard the second coat is applied, and on this the designs are impressed. In Wakasa-ware there is no painting or drawing; the white decoration is applied by droppiug egg-shell powder skilfully by hand here and there, and other designs are produced by pressing various forms of leaves on the soft surface. To get the surface completely smooth again is the next operation, and then a transparent lacquer, coloured yellow, is applied with the object of affording a yellow ground for the gold which is to follow. This is covered by successive coats of the same lacquer until a smooth surface is again obtained, beneath which are the gold and decorations.—*Indian Engineer.*

Cultivation of Egyptian Cotton.—The cultivation of Egyptian cotton is to be tried in the Ludhiana district in the Punjab. The Executive Engineer of the Division will superintend the experiment.—*Indian Egineer.*

A New Bark for Cleansing Wool, &c.—At a recent meeting of the Linnean Society Mr. T. Christy exhibited specimens of the bark of *Quillaia saponaria* from Chili. An extract of this bark has been used for some time for cleansing silk and wool, and in special preparations for cleaning gloves, &c. It is however, stated that it will solidify the hydrocarbon oils, even benzoline, and thus insure safe transport on a long voyage. The addition of a small quantity of citric acid renders them liquid again.—*Public Opinion.*

The Sugar Trade of Mauritius.—In his report on the Mauritius Blne Book for 1888, just issued, Sir J. Pope Hennessy remarks that Mauritius is, as far as he can judge, the most flourishing sugar-producing colony of the British Empire. Tho total value of the exports of the produce of tho Colony in the year in question was R30,335,545, showing an increase of R6,000,000 against the provions year, and of the total sum R28,754,798 represented the value of the sugar exported, including R15,000,000 the values of the sugar sold in India, R7,000,000 in Australia, R2,000,000 in Cape Colony, R2,000,000 in the United Kingdom, and R1,000,000 in the United States. The relative greater prosperity of the sugar trade of Mauritius compared with that of the West Indian islands is partly owing to the Mauritius planters having the command of the Indian and Australian markets, which are too remote from the West Indies for competition by the planters there. The greater facility for obtaining cooly labour from India is also probably an advantage. The most important economic difference between Mauritius and the West Indies, however, is the fact that nearly all the owners and managers of the sugar estates are natives of the island in the former case, abseuteeism being much more characteristic of the West Indies. The great fall in the price of sugar in recent years has been met by the Mauritius planter, to some extent, by means of a prudent reduction of expenses and the adoption of improved processes so as to increase the yield of sugar from the cane.—*H. & C. Mail.*

Manila Tobacco.—The American Consul at Manila in the course of a recent report on tobacco cultivation in the Philippines, remarks that the abandonment of the Government monopoly in 1882 gave the trado a great stimulus by the investment of private capital in it and a more equitable system of dealing with the native cultivators. There has therefore been a marked increase in the production. Formely each unmarried native was required to set out 4,000 plants a year, and each married man 8,000, the crop to be delivered to the officials at a standard price, which was just 50 per cent, below that now paid. The gross revenue received from the monopoly was about £800,000 per annum. At present there is a licence tax of about £20 a year for manufacturing tobacco. The principal company engaged in the trade now is the Compania General, which owns large tobacco estates, has a capital of about three millions sterling, employs 10 000 hands, and produces 80,000,000 cigars, 400,000,000 cigarettes, and 5,000,000 lb. of cut tobacco annually. It is a Spanish company; there are also two large German firms, six Spanish, and a number of Chinese. The best tobaccos come from the provinces of Cagayan and Isabela, in Luzon, the annual produce from these being 60,000 to 100.000 tons. The method of cultivating and curing differs but little from that followed in other tobacco-producing countries. All Manila tobacco is made into cigars and cigarettes, plug, fine cut, or pipe tobacco being unknown there. It is classified in six grades according to the size and quality of the leaves. The total area of land under tobacco is about 60.000 acres. Last year the total export of cigars was 112,074,000, of which 26,715,000 went to Spain and 17,871,000 to Great Britain and the British possessions. In 1887 the total export amounted to 121,350 tons, and in 1888 to 184,548 tons.—London *Times.*

CINCHONA BARK was exported from Java between 10th June and 12th July as follows:—

369,630 lb. for Holland.
24,821 lb. for London.
4,302 lb. for Marseilles.

398,654 lb. total.

THE INTRODUCTIOG OF THE SUGARCANE INTO CEYLON is, in Dr. Lippmann's great work, credited to A.D. 600, or nearly thirteen centuries ago, the authority being "Ritter." The introduction of the sweet cane into those portions of India beyond the Ganges is fixed so early as 327 B.C., on the authority of Nearchos. To our surprise China (whence our native term *sini* or *chini*) has a later date assigned it, B.C. 250.

IMPORTANT DISCOVERY IN THE RUBBER TRADE.—A M. Morellett has made a discovery which is of considerable importance to those engaged in the rubber trade. He has found that when vulcanised indiarubber is dipped suddenly into boiling glycerine it acquires the character of non-vulcanised rubber —*i.e*, its parts can be readily united, and it dissolves in the common solvents of caoutchouc. The glycerine must be boiling at the moment of contact.—*European Mail*, June 13th.

FLOWERS AS AN ARTICLE OF FOOD.—The new Kew *Bulletin* contains a memorandum by Mr. Duthie, botanical director for northern India on the use of the flowers of the *Calligonum* for food in North-Western India. The use of flowers such as those of the lily in China as a condiment is not uncommon, but it is quite unusual to find them used as food. In the present case they are hardly the poorer classes only, and are either mixed with flour or are eaten separately with salt and condiments, to which a little ghee is added by those who are able to afford it. The flowers are swept up from the ground, and are kept for a night in a closed earthenware vessel, so as to fade. They may be kept for a long time. Usually they are eaten as a vegetable, but sometimes they are kneaded with thin alta and baked in cakes. An analysis of the flowers which has been made shows that their chief peculiarity from a dietetic point of view is their richness in nitrogenous compounds, and consequently their importance as an addition to foods which are poor in nitrogen. There is said to be a close resemblance in composition between phog and the seeds of the edible amaranths and buck wheats, only sugar replaces starch.

PRESERVING FISHES.—When Prosessor A. C. Haddon visited Colombo in passing through from Torres Straits, he was much struck with the success of the Director of the Colombo Museum in preserving fishes in a way to display their natural colours. He considered the result would interest home scientific men and arranged for an exhibit where it would be certain to attract attention. Accordingly at the Conversazione of the Royal Society held on the 18th ult. under the presidency of Sir Geo. Stokes, in the descriptive Catalogue which only covers 40 exhibits, we find the following:—

"*Exhibited by Prof. A. C. Haddon, M.A., on behalf of Mr. A. Haly, Director of the Colombo Museum*:—

"Teleostean Fishes preserved in a mixture of gum and glycerine, as a means of displaying their natural colours.

"The fishes were bisected and eviscerated, and they are mounted, for exhibition purposes, in pure glycerine. Specimens thus treated have been observed to remain unchanged after two years' exposure to the light."

Since this exhibit was sent home, however, we believe Mr. Haly has been experimenting with a different preparation and with the prospect of even greater success than was considered so noteworthy by Professor Haddon.

CALIFORNIA is a rich honey country, and the fact is largely owing to the cultivation of the *Phacelia tanacetifolia*, a plant with a blue flower of which the bees are fond. Experiments on a practical scale have recently been made with it by a German bee-master, and the results are given in the *Bienen Freund*. Some six weeks after the seeds are sown the *Phacelia* blooms, and it is then rifled by the bees. But it also serves as fodder for cattle, either before it flowers, or in a dried condition afterwards. When used for green fodder it is necessary to reserve a portion for the bees, and the production of seed grain. The roots as well as the stems and leaves are devoured by cattle.

HOW TO DESTROY BUGS IN PLANTATIONS, &c.—By a curious coincidence, immediately after writing the concluding lines of the article which appeared in yesterday's issue, about soil and tillage generally, we came upon a paragraph in "Garden and Forest," an American periodical, describing a method of destroying the cockchafers, which are known in the United States as "May bugs." We quote as follows:—

It is well known that the larvæ of the May-bug or Dor-bug do an immense amount of damage by eating the young roots of grasses, Strawberry and other delicate rooted plants. In France, especially, their ravages have resulted in great losses, and energetic attempts to destroy them are made. The destruction of these beetles is a matter of such importance that a word, "Hannetonnage," has been coined to express the action of hunting them. It appears, according to the *Revue Horticole*, that during the year 1889 the Department of Seine-et-Marne paid no less than 113,000 francs in prizes for the destruction of the beetles, which were collected to the amount of more than 500,000 pounds. They are trapped by suspending lights over shallow vessels of water. The beetles fly against the glass covering of the lamps and drop into the water below, and are then collected and destroyed. The experiment has been tried in this country with success, and it is worth doing on a large scale wherever these insects abound. As the presence of the larvæ is not known until the damage which they inflict is completed, the only way to attack them is to trap the beetles. A little kerosene-oil poured on the water placed in the vessels into which they are intended to fall will deprive them of all chance of escape.

TREATMENT OF CATTLE.—We have to acknowledge the receipt of a pamphlet on the treatment of cattle in Sinhalese, by Mr. W. A. de Silva of the School of Agriculture. The work is dedicated to Sir E. Noel Walker as President of the Society for the Prevention of Cruelty to Animals; and the author says in his preface:—

In presenting this pamphlet to the public, the Author begs to state, that he has endeavoured, as will be seen to draw up short, simple and explanatory facts, on the improvement of the condition of the native cattle of this Island, which would recommend themselves, to the means and requirements of the village cattle owners. It is well known that the prosperity of a country where agriculture is the main industry of the inhabitants, depends to a great extent, on the number and nature of the cattle of that country; and it is a matter for regret and apprehension, that the native cattle of this Island are both degenorating and decreasing in number. * * * The individual efforts which are being made by such as those who have the welfare of the people at heart, to improve the condition of cattle, are only partially successful or sometimes totally fail, to their great disappointment, owing to the comparative ignorance on the subject of the villagers. I am far from claiming for my pamphlet the merit of effecting a radical reform, but I shall be satisfied, if my feeble attempt in the interest of my countrymen would at least tend to a *more humane and considerate* treatment in health and disease of the *most useful animal* in this country.

We hope that this pamphlet will be the means of effecting the improvements which its author desires.

THE ORIENTAL BANK ESTATES COMPANY, LIMITED.

Authorised Capital ... £566,700.

DIRECTORS.—Alex. William Crichton, Esq., Andrew John Macdonald, Esq., William Cotton Rohde, Esq ; Grant Heatly Tod-Heatly, Esq.

Report of the Board of Direotors for Thursday, July 17th, 1890, at noon:—

The Direotors have much pleasure in submitting to the Shareholders their report of proceedings dnring the fonrth year of the working of the Company. The net profit as shewn in the andited accounts annexed hereto amounts to £26,628 11s 6d (inclnding £159 2s 4d brought forward) as against £25,803 16s 11d last year. An interim dividend of 3s 6d on the Preferred Shares and of 6d on the fnlly paid Ordinary Shares, and of a proportionate amount on the partly paid Ordinary Shares was paid in February last, and the Directors now recommend the payment of a similar further dividend making a total payment of 7 per cent per annum on the issued Preferred Shares, and of 5 per cent per annum on the Ordinary Shares, in proportion to the capital paid up thereon for the year ended 31st March, 1890. The further dividend now recommended as above, will, if assented to by the Meeting, be payable on the 1st August, 1890, at the London Office of the Company's Bankers.

The estimated yield of Tea from the Company's Estates has been fully realised, bnt owing to the low ranges of prices ruling dnring the first three months of the year under review, purchase of leaf was restricted during that period. The average price obtained for all tea sold has been the same as in the previous year—viz., 11d. The expenditure on mannring and otherwise improving the plantations has been continued, as results obtained from these works have proved most satisfaotory. The supplying of vacancies has been carefully done, but during the past season it has not been deemed advisable to extend the area of land planted with tea. The increase of the yield of coo a dnring the past year from the Company's Estates has been considerable. The crop has been barvested in good condition, and the prices realized have been snch as to indicate its good quality and the care taken in its preparation. The Directors have sanctioned extensions of this cultivation in snitable localities on the estates, which additions, when they oome into bearing, will materially increase the valne of the properties. As the Directors anticipated last year, the price for cinchona bark has ruled throughont the year above that obtainable at the last meeting of the Company; bnt the supplies, although considerably smaller, have not yet sufficiently diminished to impart a sound tone to the market. The crop of coffee has been larger than last year and good prices have been obtained for the same.

In Mauritius a satisfactory crop of sugar has generally been secnred on the estates in which the Company is interested, and, notwithstanding the decline in the valne of this prodnct in the Enropean markets, good prices were obtained by the Company for its sugars. The cost of labonr and snpplies for coolies has been somewhat higher during the past year than previously experienced, but it is expected that the increased cost, if it should continue, will be met by the results to be obtained from the improvements in cultivation and in the manufactnre of sngar.

Shareholders will be interested to learn that five prizes were awarded at the Dunedin, New Zealand, Exhibition for sngars made on estates undor the management of the Company.

BALANCE SHEET TO 31st March 1890.

Dr. LIABILITIES	£	s	d
Paid-up Capital—			
226,816 Ordy. Shares £1 each fully paid	226,816	0	0
1 446 Ordy. Shares £1 each 1s paid	72	6	0
40,902 Pref. Sharcs £5 each fully paid	204,510	0	0
	£431,398	6	0
4½ per cent Mortgage Debentures	150,000	0	0
Sundry Creditors—Acceptances ...	14,000	0	0
Accounts Payable ...	19,183	18	8
Balance (as per Profit and Loss Account)	13,803	0	9
	£628,385		5

Cr. ASSETS.		£	s	d
Cost of Estates, Claims, Shares, &c., held by the Company as per last account		431,973	1	5
Additions since	£3,029 4 2			
Less Sales and amount written off Machinery and Buildings	2,200 6 5			
		828	17	9
		432 801	19	2
Stocks of Sugars in hand		7,832	3	0
Stock of Tea, Cinchona, Cocoa, Coffee and Cardamoms in hand ...		33,324	6	7
Office Furniture ...		71[illegible]	7	6
Stores in Ceylon and Mauritius ...		7,374	7	3
Sundry Accounts receivable, &c. ...		10[illegible].917	5	0
Advanced on Mortgage ..		13,037	2	6
Suspense Accounts (Stamps on Share Warrants)—				
Balance brought forward	£3,000			
Less written off	£1,000			
		2,000	0	0
Cash in hand or on deposit		28,383	14	5
		£628,385	5	5

PROFIT AND LOSS ACCOUNT TO 31ST MARCH, 1890.

	£	s.	d.
To Expenditure :—			
Upkeep of Estates and Charges in Ceylon, Mauritius and London (including amount written off Suspense account and Allowance for depreciation on Machinery and Buildings)	99,777	2	8
Interim Dividend paid in February, 1890 ...	12,825	10	9
Balance	13,803	0	9
	£126,405	14	2
By Income :—			
Balance of profit from last account after payment of the dividend	159	2	4
Produce in hand estimated to realize net .	41,156	9	7
Proceeds of Produce realized to 31st March, 1890. and profits arising from Agency Business, &c.	85,090	2	3
	£126,405	14	2

COCONUTS AND CINNAMON.

VEYANGODA, June 18th.—The effeots of the season are rather serious on cinnamon crops, as harvesting has ceased. The harvests are dnring the two monsoons, or to be more accurate dnring the continnance of the monsoon rains, for it is only then tbat there is a free flow of sap between the bark and wood. No rain, no crops is the almost universal cry this season.

The prospects of coconuts are very much brighter. This is the season for big crops, and big prices are netted for them. The demand for coconuts is very brisk, as there is much competition between the local and Colombo Dessicating Mills. That this may continue is the earnest wish of coconut growers. The oonsnmption at the local Mills, judging by the strings of carts that wend their way thitherwards, cannot be far short of 200,000 nnts per month. If report speaks true the Colombo concern consumes an equal quantity, though I am inclined to think it consnmes more, judging by the fact that its agents come so far afield as Veyangoda to buy nuts, while they have the run of the districts clnstering round Colombo to draw supplies from. It cannot be that the nnts on that side are converted into copra, for the prioe offered for the nuts precludes such a possibility. I have heard that one of the coconut contractors of the Colombo Firm intends going far into the famous coconnt district of the Maha Oya Valley for nuts. Hurrah! may the demand for nnts grow. The Oil Mills in Colombo I suppose will continue to draw their supplies of copra mainly, as hitherto, from Negombo and the Districts North of it and by water, while the bnlk of the trees South of Colombo will be devoted to toddy drawing.—Local "Examiner."

PAPER is made in France from hop vines; and it is claimed that the fibre secured is the best substitute for rags yet obtained, as it possesses great length, strength, flexibility and delicacy.—*American Grocer*, June 18th.

EARLY PLANTING DAYS IN UVA.

The following was written by a *Badulla* correspondent some seven years ago, the MS. getting mislaid. We have put some notes correcting what is out of date as far as possible:—

The first estate opened in Badulla district was Ridipane* by Major Rogers, and it still goes by the name of "Major Totum." It is on the old Batticaloa road and only a couple of miles away from town. It afterwards passed into the hands of George Boyd Tytler, the brother of our good friend the late R. B. T. He died in Badulla, and his remains awaited his brother's arrival from Kandy nearly three days before they were buried. He came up by the Lower Badulla Road. There was only one European beside the brother of the deceased at the funeral, Mr. Mercer, the Assistant Government Agent. This estate is now the property of the big native firm of Annamalay Chetty who own several other estates in the district. Maryland and Ooduwerre were opened by Mr. Galland the Swiss doctor,† who was induced to it, by the success of Major Rogers in coffee planting. The former is now called Kottagodde; much of it is abandoned. These were afterwards taken up by Mr. Anthony Bertlin, who is still hale and hearty in the old country. Ooduwerre keeps up to the front. It is admirably situated, having the facility of transport, as the Ratnapura-Batticaloa road passes through it. Wewesse and Debedde were opened by Dr. Sortain. These estates at one time seemed to have been neglected, but coming under the able management of Mr. George Morice, the "Patriarch of Uva," they became very valuable, and some years ago fetched a large sum. They have come back again to the Parsees and Mr. Morice. With Spring Valley the name of Sir William Reid is connected, and afterwards with Mr. Bannatyne who would not proceed further than Nuwara Eliya, when he came to see his property, thereby very nearly causing a split between himself and his very independent manager, the late Mr. Thos. Wood. Of Nahavilla and Gourakelle, much need not be said: the name of your senior is associated with the former, and the names of Mr. William Walker Shand and Mr. John Reid Shand are also connected with them. The waterfall on Nahavilla is still there. Gonakelle, or rather Pallagalla, was opened by Geo ge Bogue, a brother of John Morris Bogue, a partner of the late firm of Brodie, Bogue & Co. The names of Bertlin, Byers, Linton, Morice, Wood, Irvine, and Knowles come up later on when Glenalpin, the remainder of Spring Valley, Ballagalle, Grahamsland, Kenakelle, Narangalle, Hindegalle, Unagalle, Koskelle, Gongaltenne and others were opened. There is rather a rich story told of Major Rogers. He urged on Government that a road should be cut from Ratnapura by way of Haputale to connect with Badulla, but the Government declined on the plea that the Major would be the principal beneficiary as he had two estates on the Pass, viz., Haputale and Sherwood. It was reserved to Sir Hercules Robinson to make this line on to Batticaloa, thus connecting the west with the east. The produce of Badulla in some instances was conveyed to Hambantota to be shipped to Colombo.*

In the account of the building of the Badulla church, it was Rambukpotta Disava who brought out the idea of a Christian place of worship in memory of the late Major Rogers. He and his fellow chiefs—all Buddhists—the Ratemahatmayas of Udukanda, Bintenna, Wiyaluwa, Kandapolla, Kandukare, and Wellassa contributed each a month's salary towards the object, and the minor headmen also according to their means. The Disava, besides his subscription, gave nearly all the timber for the building. Pakeer Tamby constable, as the head of the Muhammadans, got large subscriptions from that community, and the chetties also followed suit liberally. The foundation stone was laid in 1846, and in the bottle was put in a coin of the date of 1750 by the late Mr. Solomons. The various officials who were connected with the building of the church were Messrs. Mercer, Braybrooke and Bailey. The first churchwarden elected was Mr. G. H. Orloff. It was distinctly understood that the church was to be open to all Protestant denominations, but how it went over to the Episcopal Church this deponent sayeth not, and it was convenient that no questions should be put. The contributions to the church being principally heathen, it is rather rough on them to be told that "thus far shalt thou go, and no further" into the church, if they intended to pay their last respects to the dead.†

* The following are the present proprietors of the estates mentioned by our correspondent, as given in the "Ceylon Handbook and Directory, 1890-91:"—

Redipane	...Anamaley Chetty
Oodoowere	...F. R Sabonadière & Heirs A. Bertlin
Wewesse, Debedde	...Mrs. Cowasjee Eduljee
Spring Valley	...Spring Valley Coffee Company, Ld.
Nahavilla	...Hormusjeo Bhomanjee Jeejeebhoy
Gourakelle	...G. S. Duff & Mrs. Ogilvie
Gonakelle, Pallagolla	... Colonel J. R. Dawson & G. S Duff
Glen Alpine, Graham's Land, Ballagalla, Narangalla, Hindugalla	...Onvah Coffee Company, Ld.
Unugallla	...E. P. Thornton
Kecnakelle	...Baring Bros.
Koskelle	...E. C. Byers
Haputale, Sherwood	...Haputale Coffee Company, Ld.
Gongaltenne (now Serendib)	P. F. Hadow.—ED. *L. R.*

† Staff Assistant Surgeon Galland was not a Swiss, but a Maltese, who, when Sir Walter Scott visited Malta, in his last and vain pursuit of health, acted as interpreter between the great writer and some Arab chiefs. Our authority was Dr. Galland himself, who was in medical charge of the detachment of Ceylon Rifles stationed at Badulla, when, in December 1840, the senior editor of the *Observer* first visited Uva, examining forest and cutting boundaries until May 1841. Capt. Rogers, the great elephant hunter, was Commandant, with Lieut. Hodges as second in command. Dr. Galland's brother-in-law, Mr. Bertlin, was o ng in charge of the estates.—ED. *T. A.*

INDIAN TEA COMPANIES: THEIR PRODUCTION AND EARNINGS.

Messrs. Barry & Co. have compiled a "Summary of Audited Accounts of Joint Stock Tea Companies registered in Calcutta; Seasons 1885 to 1889." A note explains that

Expenditure includes cost to grow and fetch to market, account sale charges, interest on the season's outlay when incurred, depreciation on machinery and buildings when charged. But commissions on profits, income-tax, and interest on debenture capital are excluded. Income is given gross, *i.e.*, the auction-room price. Debenture Capital is not included in the Capital column.

The Assam Companies rose from 18 in 1885 to 23 in 1889, and the paid-up capital from R5,568,000 to R10,248,000. The crops began at 2,740,000 lb. and rose to 6,406,000. The realized gross average per lb. went down from annas 10·9 to 9·2. The cost per lb. also diminished from 8·7 to 7·10. The profit per lb. went down from 2·2 to 1·3.

* The late Mr. Alex. Brown took an active part in this operation.—ED. *T. A.*

† Allusion is made to a rule that non-Christians were not to enter the church.—ED. *T. A.*

The Cachar and Sylhet companies began with 23 and ended with 19, and the profits per lb. went down from 2 annas to 0·7.

In Darjeeling and the Dooars 37 Companies rose to 40 and went down to 31. The profit per lb. began with 3·1 and went down to 1·9. In Darjeeling alone 31 Companies in 1889 realized annas 1·4 per lb. profit; 9 Companies in the Dooars having the same experience.—In the above we have left out fractions which, however, we give with reference to the total results. These show that the average profit per lb. of 78 Companies in 1885 was annas 2-5·75 which, for 82 Companies went down to 1-1·80 in 1889. Our readers will more readily appreciate the figures for dividends: the average in 1885 was 5·21 per cent, going down to 4·18 in 1889.

With all the improvements introduced, therefore, and all the economies practised, profits have diminished with enhanced production and lowered prices, until returns are not equivalent to the interest which money in India ought to command. The acreage cultivated by the Companies included, had risen in the five years from 42,700 to 53,500 and the crops had increased from 12,154,000 lb. to 17,512,000.

The results are not very encouraging, but the capital expenditure had in many cases been heavy. Our Ceylon Companies seem immensely more prosperous. May that prosperity continue and may it be shared by individual planters.

PUBLIC COMPANIES.

LIBERIAN GOVERNMENT CONCESSIONS AND EXPLORATION.

Mr. A. C. Ponsonby, chairman of the board of directors, presided yesterday afternoon at a meeting of this Company, which was held at the Cannon-street Hotel. The Chairman said that the Company had 350 shareholders on their list, and he hoped, whether the stock went up or down, they would not dispose of their shares, because he believed there was good business to be done. He believed the East Coast of Africa was more healthy than the West Coast, but the latter was more wealthy, and many people were willing to go and work for the company. Some gentlemen who held Liberian bonds of 1871 had approached them with the object of purchasing their indiarubber concession: and an Indiarubber Estates' Company had been successfully put before the public, the Liberian Company having some part of the payment in shares and a considerable portion in money. They hoped to make arrangements with Sir John Pender, by means of which they would obtain direct telegraphic communication between Liberia and England, and this would greatly tend to facilitate an interchange of commerce. Apart from the indiarubber there was every reason to believe that the territory would yield large quantities of cotton available for the English markets. Some alterations in the articles of association were adopted on the motion of the chairman, seconded by Mr. Johnson.—*Daily Chronicle*, July 11th.

THE TEA LEAF.

There is in my mercantile nature nothing so entirely and absorbingly interesting as a tea leaf, and I trust I may be forgiven for considering this alien subject worthy of a few lines of sentiment. I must confess to begin with, that to do this subject the justice it merits would require the fine poetic genius of a Shakspeare and the delicate word-painting of a Howells, and being only an ordinary everyday grocer intent on seeing that the multitude is supplied with pure and unadulterated goods (and plenty of them) I trust my stumbling lines will not ruffle the feathers of the literary jays too much. In the words of the aged, but repentant sinner, "Them's my sentiments, anyhow."

"The poets sing of beauteous flowers
In sweet and touching rhymes,
They sing of Love and lovers' bowers:
Of wars and peaceful times.
They sing of Nature's princely gift,
Of Sorrow, Grief, and Pain,
They sing of vales and mountain rifts
Of Power and Wealth and Gain
They chant their songs and hymn the praise
Of Ocean, Earth and Sky,
Of Lethe's stream and Pluto's realm
And of Parnassus high.
And yet their Muse, the partial jade!
Withholds her smile from thee,
And leaves to me of plebeian trade
To chant the praise of Tea.
And though my lame and limping lines
Be void of finished Art,
They still, though rough-hewn, bear the signs
Of all that's in my heart.
Thou meek, mild herb, man's humble friend,
Thou fragrant, soothing flower
That cheer'st the world from end to end
And comfort bring'st each hour,
From China's fields and India's hills
And Ceylon's humid shores
Thou com'st to ease our earthly ills
And ope Contentment's doors.
Of Heaven's many gifts to man,
And myriads though they be,
There's none so all divinely great
As thou, oh wondrous Tea.
Thy little, twisted curly leaves,
Thy fragrant, balmy breath,
Thy soothing, cheering, gladd'ning touch
Robs half the fear of Death.
The prince, the pauper, rich and poor,
The great, the strong, the weak.
The learned men of mighty minds
Thy cheering cup must seek.
The soldier worn with warring cares,
The sailor on the deep,
The humble delver, with thy aid
Obtain refreshing sleep.
The patient watcher by the side
Of fever's fitful bed
Would surely find her task too great
But for thy blessed aid
The weary seamstress, evening come,
Her humble home regains.
And in thy strengthening fluid finds
Great solace for her pains.
The ladies, Fashion's fluttering birds,
Dear gossip-loving dames!
How round thy post-meridian board
They sip—and ruin names.
Oh! wondrous leaf, oh, beauteous flower!
Thy virtues are untold—
From immemorial time, each hour,
New joys thou does unfold.

Accept these humble lines from me—
And know I love and worship thee
Oh, Tea!!

WILLIAM HENRY SEYLER, in *Canadian Grocer.*

THE TEA TRADE OF FOOCHOW.

A LAMENTATION.

The following 'communicated' article appears in the *Foochow Echo*:—

It is with an ever-deepening regret that we watch the decay of the principal trade of this port—Tea.

There is no blinking the fact that each season sees a smaller business in our staple, and that even with the lessened receipts of the leaf, there is annually more trouble and difficulty in the purchase of it at this side, and shall we say—loss in its sale at the other. The reasons for this gradual falling off of what should be one of the best, most remunerative, and cleanest of trades, are not far to seek. They have been again and again brought to the notice of those most concerned in the business, they have been made as public as print can make them, and with what result?—absolutely none. Is the case then hopeless? We answer unhesitatingly, Yes, whilst present conditions last. Let us first look to the quality of the article now exported. It compares most unfavourably with what we were accustomed to see, say 15 to 20 years ago. The 'make' is not so good, more brown and withered leaves are left in the bulk, less trouble is expended over the twisting, and more dust is found. The firing, formerly performed with great care, is now hurriedly done, and to please

the 'nose' of buyers, is frequently left little more than half done. The result in the 'cup' can be easily guessed.

We are told by the native Tea Hongs that it is now impossible to perform the various manipulations through which the article has to pass before it reaches the foreign buyer, at the same cost as in years gone by; that, as we find it in civilised Europe, so it is in this country, the cost of living and of work has increased much in the last two decads, and with the usual shrug of the shoulders we are informed as a final argument, 'no can help.' Another cause of the falling off in quality is, from the native view, the uncertainty of the foreign demand, and strange as it may seem, the introduction into the Tea districts of the telegraph. Before the wire reached the garden districts, the native buyer knew his instructions, and bought such leaf as he approved of, conveying it to his central factory, where it was speedily turned into the 'fragrant herb'—now—what is the case! He goes up with instructions, it is true, but the 'telechit' controls them. No sooner has he commenced his purchases, than the result of previous seasons shipments to London, or elsewhere having been received by the foreigner, with anything but satisfaction, (or some other cause for alarm) is at once either directly conveyed to the 'Hong,' or filters through our own native staff to it, and—a little message flies up country, 'wait while,' or the equivalent of such words. The recipient of the message obeys—his purchases up to the time of its receipt are too small to make a chop—whilst he is waiting for permission to buy further, what becomes of the leaf so bought?

So far as we can learn, it is half rolled and half-fired, and laid aside for a few days, until the first alarm having subsided, the requisite permission is accorded, further leaf bought, and a 'chop' is made. We readily concede that we may be somewhat in error over the '*modus operandi*,' but some such process occurs and is partly responsible for the falling off in quality. Of course the utter neglect of the plantations is one of the primary causes of this falling off, the excuse for such neglect, in the mouth of the grower, is the small price received by him for his leaf, which makes the growth of the succulent sweet potatoe quite as remunerative, and less precarious. Of the causes affecting the cost of laying down Tea from the country at this port, it is unnecessary to speak at length;—to the tale of 'lekin' and subsidiary squeezes, often told the Chinese Authorities are deaf as adders, and their deafness and blindness are increased by the utter, or might we say, *intentional* stupidity of their foreign adviser. When one so highly placed refuses to see any possible amelioration of these causes, and consoles himself, and the Native Authorities with a shrug of the shoulder, and the consoling remark, that *if the duty receivable on Tea 'is' falling off, that on silk &c. is increasing*, what hope is left? As to any such suggestions that the 'Lekin' being a war tax, should long ago have been withdrawn, and that the export duty is now ridiculously in excess of the percentage intended at the time of its imposition, our own high officials are much too suave, and much too tender of the friendly relations of the two Empires to hint at any such disagreeable items.

Again, why so much dust and broken leaf should be found in every package of Tea brought to this port we fail to understand. We believe we are right in saying that the percentage found in Teas at Hankow and Kiukiang is smaller than at this port, whilst to compare either with that found in Teas from Ceylon is interesting, and——instructive. To praise Ceylon Teas, and to laud their cleanly manufacture, and the cheapness with which they are made, and to instance their fast increasing consumption not only in Europe but in our stronghold, Australia, is nothing to the point and only calls up envious feelings, nay even sometimes makes us cast a malevolent glance at the 'figures' relating to the increased export from the 'spicy isle,' which are so persistently set before us in the *Echo*; and indeed we have an idea that the worthy purveyor of those figures may occasionally cast a wary look around him when returning from some festive board to his lair, lest perchance the 'bitter cup' may some day overflow and he—the most approximate cause, be——but we forbear.

Bitter it is to see—certain it is to predict the continued decay of our trade and our living, unless—what? Unless a miracle happens, the floodgates of Chinese restriction removed, foreigners permitted to own, or at least to superintend Tea gardens, and generally, this portion of the globe of most interest to us, to make a complete somersault. Is it at all likely in *our* time?—*China Mail*.

PLANTING IN NETHERLANDS INDIA.

(From the *Straits Times*, July 9th.)

The sugar cane disease in Java still defies the experts, who find all the suggested remedies break down. The importation of plant cane from abroad has proved utterly unavailing to stay the evil. The nature and causes of the disease baffle inquiry, and appearances point to no more satisfactory result in the near future. The *Surabaya Courant* gives particulars of the sugar yield in Java of late years, which shows that the outturn in 1887—375,000 tons—has not been exceeded since. This year's crop is likely to fall four per cent short of those figures.

In the Java ports, the supply of estate managers, assistants, and overseers largely outruns the demand, and applicants swarm when chances of employment as such even in other lands offer themselves. British North Borneo, especially, has proved so attractive that it draws a steady flow of the unemployed. For instance, by last advices, several Europeans had started from Java for that country to fill situations on coffee and sugar estates.

The island of Engano, near the southern end of Sumatra, has been applied for from Government by a Mr. Van Gogh on lease. Recent legislation has simplified applications for concessions of whole islands by dispensing with the need for preliminary survey.

CEYLON BOTANIC GARDENS.*

BY PROFESSOR HARVEY OF TRINITY COLLEGE, DUBLIN.

Royal Botanic Gardens,
Peradenia, Ceylon, October, 10th, 1854.

I propose sending you a short account of the present state of the Ceylon Botanic Gardens, now under the able management of G. H. K. Thwaites, Esq. These gardens are situated at Peradenia, four miles from Kandy, on the high road to Colombo, and at an elevation of about 1600 feet above the sea. They cover an undulating surface of 140 acres, a considerable portion of which is occupied by an arboretum, into which, from time to time, the native forest-trees are introduced, and where eventually will be brought together most of the arborescent plants of the island, and such valuable forest trees as will stand the climate. The river Mahawelle Ganga flows round three sides of the garden. The opposite banks are steep, gradually rising into wooded hills of various heights; some reclaimed and planted with coffee, others still covered with the jungle.

The approach to the garden, from the Kandy road, is through an avenue of tall India-rubber trees (*Ficus Elastica*), hung with various creepers, such as *Bignonias* and *Ipomœas*, and nearly opposite the entrance gate, a remarkably fine specimen of *Bauhinia scandens* (jungle rope) throws its strangely compressed and twisted rope-like stems from branch to branch, and stretches fairly across the road. Immediately within the gate the broad gravelled road divides round a circular bed of palms, such as at some future day the new Crystal Palace may exhibit, but which, for luxuriance, is as yet unrepresented in England. The group comprises the talipot (*Corypha umbraculifera*), *Livistona chinensis*, *Caryota urens*, dense clumps of *C. horrida*. *Borassus flabelliformis*, *Areca catechu*, *Seaforthia Dicksoni*-

* From the "Literary Gazette and Journal of Science and Art" of 26th November 1853.

Cocos nucifera, *Oreodoxa oleracea*, *Phœnix dactylifera*, and *Ph. farinifera*, a fine unnamed Malayan palm, two species of *Calamus*, and very large specimens of *Cycas circinalis*. Some of these are twenty, some forty, some sixty feet high; some have fan-shaped, some pinnate, and some much divided fronds: and being brought together into a definite clump of gigantic foliage, forcibly arrest the stranger's attention, particularly when his glance also falls on the beds at either side, where large *Scitamineæ* and *Yuccæ* are overtopped by two huge traveller's trees (*Ravenala speciosa*) with palm-like trunks at least 35 feet to the base of the leaves and fully 50 feet to the extreme top. The specimens of this noble plant in English stoves, where the caudex is either not at all, or scarcely formed, give no adequate idea of the *port* of a full grown plant, with its fan of 40 or 50 distichous leaves, each leaf 12 to 15 feet long, mounted on a column 30 to 40 feet high, as formally as if the whole had been cast in bronze. I can think of no better comparison for this grotesque, and yet noble object, than the great fans of peacock's feathers which are borne on each side of the Pope on festival days. The leaves, like those of the banana, are usually torn to ribbons, which makes them look still more like feathers as they wave to and fro in the wind.

On passing the group of palms you enter a straight road, running through the garden to another palm-circle recently planted at the farther end. This road has wide side-borders well furnished in front with flowers and small flowering shrubs, and in the rear with larger shrubs and trees, among which, here and there, are scattered palms and *Pandani*, the latter conspicuous for their snake-like stems and branches, terminal screw-like tufts of sword-shaped leaves, and abundant ropes and cables. These borders are at all times gay with bright-leaved plants and flowers. Among the former, *Dracæna ferrea* and *Poinsettia pulcherrima* supply the brilliant pinks and crimsons, and a variegated form of the mop shaped *Croton longifolium*, the bright yellows. The flowering shrubs and trees are much too numerous to mention; a few, now in flower, must suffice. Many fine species of *Cassia*, particularly one, recently imported from Trinidad, every branch of which bears a panicle of bright golden flowers at least 15 inches in diameter, and *C. alata*, with its large fern-like foliage, dense, erect racemes, and orange bracts; *Allamanda cathartica* and *A. Schottii*, ever displaying a profusion of golden bells; *Ixora coccinea* and *I rosea Hibiscus rosa-sinensis*, *Plumbagos*, several *Clerodendrons*, *Bauhinias*, *Gardenia florida*, *Crossandra*, *Eranthemum*, and other *Acanthaceæ*; *Bignonia stans* and *Tecoma capensis*, several *Ardisiæ*, more remarkable for handsome foliage and fruit than for showy flowers; these, and many others, with abundance of roses and small flowers, keep the borders perpetually sweet and gay, *Lagerstroemia Regina*, here a tree, bearing superb panicles of purple flowers has just shed its leafy honours; *Barringtonia racemosa* still displays a few of its pendent crimson tassels, *Dillenias* and *Wormias* 20 to 30 feet high, with dark plaited leaves and white flowers; *Astonias*, *Poinciana*, *pulcherrima* and *P. regia*, the umbrageous *Solanum macranthum*; *Jonesia Asoca*, laden with rich bunches of orange flowers; *Humboldtia laurifolia*, *Calosanthes indica*, now hung with great sword shaped pods, &c. are among the larger border shrubs and small trees. *Beaumontia grandiflora* climbs the tallest trees, flowering among the upper branches; and *Capparis Mooni*, a fine Ceylon creeper, almost covers one large tree with its glossy leaves and white flowers. Two fine trees of *Phyllanthus Madagascariensis*, planted at a crossing, diffuse the *smell* (rather than the *fragrance*) of boiled potato-skins, while well grown cinnamon and camphor trees, not far distant, remind you that you are in the land of sweet spices and gums.

There is no Banyan tree in the garden; but there are several fine examples of the larger species of *Ficus*, particularly of the epiphytic fig trees which abound in the lower jungles of the Island. These species, though not necessarily epiphytic, often vegetate either at the base or in the crevices or hollows of old or half decayed trees; and in either case, the fig, growing rapidly, adheres to the supporting tree, at first modestly, like an ivy, but at length completely encloses the trunk and larger branches in a thick wooden coffin. The attacked tree, now hidden under a dense conglomeration of adnate branches and adnate ærial roots, which compose the false trunk of the fig, languishes, while the fig grows proportionably luxuriant, and at length far exceeds in size the tree, to which, as an humble parasite, it had at first affixed itself.*

But perhaps the most remarkable isolated figs in the garden are two fine India-rubber trees (*Ficus elastica*) at least 80 feet high, planted apart, one on each side of one of the walks. The girth of the largest is nearly 30 feet at the base, but it soon divides into three trunks, each 10 feet round. Its most remarkable feature, however, is not the height or girth of the stem, but the grand display of exposed roots which radiate from its base, stretching, like the spokes of a wheel, ten or twelve yards in every direction. Where they issue from the base of the trunk they form vertical plates, from 2 to 3 feet high, and from 3 to 5 inches in thickness, but they gradually diminish in height to the extremities. They are connected, here and there, by cross plates, which anastomose in a tolerably regular manner; and the whole display of roots reminds you (comparing great things with small) of the under surface of the leaf of the *Victoria regia*, if you take the trunk of the tree for the leafstalk, and the radiating and anastomosing roots for the ribs and veins.

Among the ornamental or remarkable trees the various species of *Artocarpus* deserve particular notice. *A. incisa* (bread-fruit) is sufficiently known in England by the fine specimen at Kew, which imagination may easily carry into a tree 40 to 50 feet high. *A. integrifolia* (the jack,) a tall-forest tree, 60 to 80 feet high, with excellent wood resembling coarse mahogany, dark polished oval leaves, dense well-covered branches, and large fruits hanging on short shoots, from the trunk or principal limbs; and *A. pubescens* (wild bread-fruit,) with plaited leaves of large size, are very handsome. A native species of *Antiaris* (or upas) from whose tough inner bark excellent sacks are made, has recently been introduced into the garden. Other ornamental trees are—*Schleichera trijuga* (Ceylon oak,) which at a little distance strikingly resembles *Quercus Ilex*; *Carallia ceylanica*, *Careya arborea*, *Kleinhovia ceylanica*, *Michelia champaca*, &c.; but none exceed in beauty the fern-leaved *Nepheliums* and the *Rhus decipiens*.

In a country where few trees are deciduous, a sameness of tint in the forest is to be expected; and to a considerable extent this is the case in Ceylon, if we confine ourselves to the fully formed leaves. But though distinct seasons, affecting all nature at once and strongly, are here wanting, the change of leaf often exhibits colours as bright as those which tinge the autumnal woods of America

* Professor Harvey forgot to add that the parasite, grimly named in Ceylon "the Colombo Agent," ultimately exhausts the life out of the supporting tree. —Ed. *T. A.*

with broad washes of crimson and yellow. Here, however, it is not the old, but the young leaves which are highly coloured; and as the older leaves are still freshly green on the body of the tree, the ends of the branches clad in clear tints of white, pale yellow, pink, crimson, or purple, appear to support clusters of showy flowers. If all trees changed their leaves at the same season, these tints would be as famous as these of America. The most beautiful are exhibited by *Mesua ferrea* (bright crimson), the *Eugeniæ* (crimson), *Nephelium Mora* (deep red), the *Semecarpi* (bluish purple), the *Lauri* (rich sienna brown) *Symplocus* (rich brown), *Garciniæ* (fulvous), *Ingabigemina* (very pale), a *Mesua* (whitish), *Aleurites Moluccana* (white), &c., &c.

The commonest of the indigenous palms in this neighbourhood are the kittool (*Caryota urens*) and the *Areca catechu*. Both grow almost as weeds in the garden, and nothing can be more dissimilar than their aspect,—the one bold and massive, the other all grace and beauty. The *Caryota* must not be judged by the attenuated specimens seen in English palm-houses. Here its decompound fronds are peculiarly dense and heavy, forming an oblong, compact head of drooping, sad-coloured plumes, like gigantic hearse-plumes. Its trunk is from 40 to 60 feet high, thick and columnar, strongly contrasting with the slender *Areca* by its side, which nevertheless rears its glossy plumes to quite as great a height. The largest talipot (*Corypha umbraculifera*) in the garden has a trunk upwards of 60 feet high to the base of the leaves, and measures 12 feet at the butt, and 9 or 10 at five feet from the ground. It looks exactly like a column of solid masonry supporting a leafy crown.

Several fine clumps of bamboos, like tufts of ostrich feathers, 40 to 50 feet high, exhibit the family of grasses in their grandest form. The close-shaven lawns of England must not be looked for, but the grassy slopes of the arboretum, intersected by broad gravelled walks and ornamented with scattered trees, may well be compared to English park scenery. The grounds themselves are naturally of beautiful shape, and have been well laid out. Particularly to be admired is a new road, recently opened along the river banks, from one point of which is caught a charming view of the Peradenia Bridge, spanning the Mahawelle Ganga with a light open-work arch of *satinwood*, the garden affording a foreground, with wooded hills for a middle distance, and the eye ranging, beyond the bridge, far away into the open country.

But it is high time to speak of the more important departments of the garden—namely the nursery, the spice-ground, the orchard, and the experimental garden.

In the *nursery* a stock is kept up of all useful and ornamental plants suitable for distribution in the colony; and young plants and seeds are sold, at very moderate prices, to the colonists, the proceeds being paid regularly into the public chest. Flowers and flowering shrubs are in much request, both by natives and planters, and the introduction of a handsome novelty of this description attracts many purchasers. Annual plants of the warmer parts of the temperate zone generally succeed well, but shrubby kinds are apt to form leafy branches only. Sweetbriar grows long and lanky like a dog-rose, and rarely blossoms: *Fuschias*, unless care be taken to destroy the lateral leaf buds, do not blossom; but the apple-tree is perhaps the greatest caricature, existing merely as a root stock, which throws up tufts of slender twigs like those of a raspberry-bush, like which it is propagated by division of the roots. Of course it never flowers.*

* Half-a-dozen really nice apples were recently gathered from a tree on Abbotsford, at 4,700 feet altitude.—ED, *T. A.*

The *spice-ground*, about a quarter of an acre in surface, is planted with nutmegs, cloves, allspice, cardamoms, and pepper, all of which succeed well. At present the nutmeg-trees are laden with fine ripening fruit, and are also fragrant with a profusion of flowers.

Six or eight acres are set apart as an *orchard*, and a considerable number of fruits grown with more or less success. Among these are the mango; the hog plum (*Spondias dulcis*); the rambootan (*Nephelium longan*); the litchi (*Nephelium litchi*); the durian; the bilimbi; limes, citrons, oranges, shaddocks, lemons, and wampi (*Cookia punctata*); the star-apple; sour-sop, custard-apple, and bullock's-heart; the rose-apple, jambos, guava, and pomegranate; the loquat; the numnum (*Cynometra cauliflora*); avocado pear; bread-fruit and jack; mulberry; granadilla and papaw; pine apples; bananas of many kinds; lovi lovi (*Flacourtia inermis*), which makes a good preserve, Ceylon almond (*Terminalia catappa*), and *Canarium commune*, &c. Melons have been frequently tried; but though the plant grows freely, and the fruit swells well, the latter rarely comes to perfection. Pumpkins succeed much better.

In the *experimental garden* new objects of colonial culture and new varieties of fruits are raised and propagated for future dispersion. The tea shrub (*T. Bohea*) succeeds well, and might be grown to any extent at 1000 feet higher, if sufficient labour could be cheaply had. The chocolate (*Theobroma cacao*) bears abundantly, but almost every fruit, as it ripens, is destroyed by squirrels, which are extremely numerous. The Shiraz tobacco, a recent introduction, through the garden, to the colony, has been grown with much success, and bids fair soon to supplant the bad varieties in cultivation. Cotton has been long, and is still, under experiment here and in other parts of the island; but it does not flourish, apparently owing to an insect which attacks the ripening pod, destroying the seed, and greatly damaging the wool. The Manilla hemp (*Musa textilis*) grows well, and may eventually become an important item in colonial export. Arrowroot and tapioca, judging from the specimens grown in the garden, might be raised to any desired extent and of the best quality. Mr. Thwaites has recently introduced, and is carefully cultivating, the best West India ginger, that commonly grown in Ceylon being of very inferior quality. There have also been procured from Mauritius, and recently from Kew, the best varieties of pine apples, and great improvement in this fruit may consequently be anticipated.

So far for the Peradenia garden out of doors. But this notice would be very imperfect were I to omit to mention what is doing by Mr. Thwaites in his study, and, under his superintendence, at his office and in his house. Here a herbarium of Ceylon plants commenced by his predecessors, but arranged and greatly enlarged by himself, now contains about 3000 species; and novelties still come in, and must be expected, till the southern provinces of the island in particular have been fully explored. Two native draftsmen, in Government pay, are constantly employed in making coloured drawings of all the plants, as they flower in the garden, or are brought in from the jungle.

Their work is confined to representing the plant of the size of nature; for all the magnified portions are drawn, and all the dissections made by Mr. Thwaites himself, who devotes the best hours of almost every day to this most necessary, but laborious task. Many hundreds of carefully prepared and acurate drawings show what has been done in less than four years, and are a promise

of still greater things to come. Should they be published (as is much to be desired) they will not only form an enduring menument to the author's fame, and also to that of the Peradenia Garden where they have been prepared, but they will be a most valuable contribution to botanical science.

Their great value, above most other similar botanical plates will consist in this, that the floral analysis has been in all cases made either from the living plant, or from specimens preserved in spirit, by the author himself, and not by his draftsmen. The errors incident to making dissections of dried specimens are hence avoided.

W. H. H.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, July 10th.

ANNATTO.—Fifty-two bags Ceylon seeds sold at very low prices indeed; bright at 3s, dull to ordinary low at from 1d to ½d per lb.

BAEL FRUIT.—A parcel of 94 packages partly mouldy and shelly fragments was shown today, and bought in at the nominal price of 2d per lb. There is very little chance that that price can be realised.

COCA LEAVES.—No South American leaves were offered today, but there were two parcels from the Kelvin estate in Ceylon, together 784 lb. The quality was excellent, and the leaves (of the dark-green Huanoco variety) were beautifully cured, and of fine taste and flavour. One-half found buyers at the comparatively cheap rate of 1s 2d per lb.

ESSENTIAL OILS.—There is very little alteration in any of the essential oil quotations this week. Several lots of Citronella oil in bottles, tins, and tanks (the latter holding about 9 cwt. each), mostly mixed with petroleum were offered today, bought in at nominal prices.

QUININE.—Lower: early in the week a sale of 15,000 oz. second hand Brunswick bulk at 1s per oz. was reported. Today there do not seem any further sellers at that price though we think there would be buyers at the figure named.

THE AMSTERDAM CINCHONA AUCTIONS.

Amsterdam, July 10th.

At today's public auctions 2,843 packages cinchona were sold at unit prices ranging from 8c to 8¼c per ½ kilo, equal to 1⅜d to 1½d per lb. The following were the prices paid:—Manufacturers' barks: Quills, broken quills and chips 6c to 71c, equal to 1d to 12¾d per lb.; root 15c to 50c, equal 1⅝d to 9d per lb. Druggists' barks: Quills, broken quills and chips 11c to 57c, equal to 2d to 10¼d per lb.; root 12c to 21c, equal to 2¼d to 3¾d per lb. The principal purchasers were the Auerbach, the Amsterdam and the Brunswick factories.

NORTH BORNEO PROSPECTS; A VISIT TO TEA BONDING WAREHOUSES; TEA BOXES; MR. MAITLAND KIRWAN AND HIS PATENT TEA PACKING.

So many Ceylon men have left you at various times to try their fortune in Borneo that information as to the progress of the British North Borneo Company will certainly be possessed of interest to those of their friends whom they left behind them in your island. Sir Rutherford Alcock, K.C.B., occupied the chair at the half-yearly general meeting of this Company on Wednesday last, and he told his auditors that the revenue had gone up by £14,850, or nearly 60 per cent, the total income—apart from land sales having risen from £24,986 in 1888 to £39,850 in 1889. Besides this revenue they had sold land during the year to the amount of £39,836, this amount having been received for 202,800 acres. The expenses, however, had mounted up, chiefly because of the cost of two expeditions sent out. This was an extraordinary expenditure, and would not be of frequent recurrence, Sir Rutherford said; but the directors thought it advisable not to add to the dividend which had been paid *ad interim* in January last. They hoped great things from the tobacco planting, which was going on vigorously and with most satisfactory results. The chief difficulty of their planters was scarcity of coolies, but steam communication with China had now been established, and the Chairman said he had no doubt an ample supply could be drawn from that country by its agency. He told his audience that a scheme for the construction of a railway across their territory under the land grant system was under consideration, but that until matters were more advanced he held it would be premature to enter upon any details. There was much to be hoped for from mineral products, and mainly as to coal; in the development of the sources of which last, considerable advance had been made. The closing of Sir Rutherford Alcock's address was followed by a good deal of rather warm discussion, the proprietors being anxious that power should be obtained enabling dividends to be declared upon land sales. This course the auditors decline to permit, and insist that receipts from such sales should be placed to and retained as a special reserve fund. You will recognise the important relative bearing this decision has upon the course hitherto adopted by the Ceylon Government in considering its receipts from land sales as revenue applicable to the most general purposes, an error the gravity of which, now that the end of your tether as regards available land is being rather closely approached, has come to be fully acknowledged.

My regret was expressed when last writing that space was not available for me to make some remarks upon what was observed by me during my visit to Mr. Maryetti's Tea Bonding Warehouses. On that visit I was enabled to realize for the first time that there might be some justification for the heavy charges which home agents make upon teas shipped to them from Ceylon. These have repeatedly been made the subject of complaint in your columns, and I with others have always had to acknowledge that they seemed to constitute a great and justly complained of grievance. But really, when one comes to see what has to be done with respect to tea before the chests are issued from the warehouses, the same disposition for acknowledgment does not remain. In the first place, the handing out of samples to the trade is a most laborious job, and however great may be the care exercised to escape loss it cannot be altogether avoided. Dozens of boys were constantly rushing in and demanding samples for this or that broker, their employers. To each of these an ounce of tea was carefully weighed out, and they were expected to return the same weight. Just fancy, however, what it must mean in the way of labour to work such a system so carefully as to guard against serious loss through non-return of samples! Turning to another department of the work one is confronted by the heavy charges for labour involved in unpacking the chests,—and this is particularly heavy in the case of the metal chests—turning out the contents, a job involving much delay if there be any obstruction such as framing *inside* the chest; weighing before the Customs officers, and refilling to the exact weight mentioned on the chests. By the way, I may tell you here that with some chests of Ceylon tea recently turned out their contents wighed two pounds *more* than the figures shown they should contain! Who is responsible for this out with you? The idea is here that too much reliance is placed on the boxes holding exactly a given weight, and that they are filled

without any weighing at all. This should be seen to if such a practice prevails, for two pounds excess in a quarter chest is a serious one for your shippers and planters.

After this digression by way of warning statements, I may get back to the third heavy item of expenditure to be incurred by the bonders, and that is the repair of broken boxes. When a bad voyage has been experienced, probably a dozen out of every hundred of metal or wooden boxes receive injury and require repair before being issued to the trade. I saw some of the metal boxes so bulged as to crack, and others with the lids so dented in, that, if left out in the rain, water stood in a pool on the surface and gradually leaked through the disturbed joints to the tea. As for the China wooden boxes, some of them scarcely deserved the name on arrival, and all of these had to be made good by the bonder's staff. So you can realize that the charges made on tea received here are not representative by any means of clear profit, though very probably some agencies manage to add considerably to the warehouse charges when their accounts of receipt and expenditure are made up for consignment to their constituents.

My reference to tea boxes reminds me to make mention of the fact that all the tea received ex "Carthage" in the Stanley-Wrightson chests has been sold this week at full prices, it being in "real good condition." This fact being ascertained, and confirmation to it having been afforded by the price paid by experts for the tea, the next step the Syndicate will take will soon have to be decided upon. You have already had sketched out to you by me an outline of what is contemplated by it, viz., the establishment of a factory for the manufacture of the board required from mana grass in order to avert the existing uncertainty attending the importation of the board from Holland. To carry out this programme efficiently, more capital than is possessed by the present Syndicate will of course be required, and the first step for consideration must be how this money is to be obtained.

We observe that you have been noticing lately the use of a lead paper introduced—so we understand you to say, to the Ceylon planters by Mr. Kirwan. When reading your observations upon this new material, I felt desirous of learning if anything was known about it by the tea trade here. As the result to my inquiring I found that this lead paper is well-known and freely sold in London, and that it is the same as that in which the tea arriving home in the Stanley-Wrightson chests was packed. My examination of the paper of those chests proved to me that it was an admirable substitute for lead, and of course far less weighty and costly, while to those advantages it adds that of economy in space occupied. An expert who examined the chests with me told me he believed the days of the use of lead for packing tea to be fully numbered.—London *Cor.*

THREE SAMPLES OF TOBACCO, grown in Madras, were recently submitted for the opinion, in regard to their quality and value, of the leading tobacco brokers and manufacturers of the United Kingdom. The reports of the 14 specialists to whom the samples were sent, including among others Messrs. Sales, Pollard and Co., and Messrs. Charlesworth and Austin of London, Messrs. Cope of Liverpool, Messrs. Lloyd and Son of Exeter, and Messrs. Thomson and Porteus of Edinburgh, seem to afford encouragement to the efforts which are being made to improve the cultivation of tobacco in the Madras Presidency.—*M. Mail*, July 24th.

INDIAN, CEYLON AND JAVA TEAS IN LONDON.

Owing to differences of climate, Ceylon tea has appeared in the Mincing Lane markets, since the commencement of the tea season, in larger quantity than Indian, while the increase this season in Java has shown well in proportion to the increase in Indian. The figures for Indian from 1st June to 11th July were :—

		Packages.
India :—Season 1889-90	...	40,118
Do 1890-91	...	51,325
Increase	...	11,207

		Packages.
Ceylon :— 1889-90	...	68,429
1890-91	...	93,111
Increase	...	25,682

In absolute quantity Ceylon shows not far from twice the number of packages of Indian tea, while her increase on last year is considerably more than twice the increase which Indian tea shows.

Java is advancing, the comparison being :—

		Packages.
1889-90	...	5,001
1890-91	...	7,751
Increase	...	2,750

The exports from Britain of Indian and Ceylon teas are increasing, but as yet the vast proportion of teas exported are China kinds. The deliveries of tea in June were 8,630,000 lb. of Indian and 5,163,000 of Ceylon,—the aggregate being 13,793,000 lb. against 6,059,000 China. The change since June 1888, three years ago, has been remarkable. The deliveries of China, then, instead of being less than half those of its two competitors compared thus :—

		lb.
Deliveries of China tea	...	8,438,000
	lb.	
Indian...	5,360,000	
Ceylon...	1,594,000	6,954,000
Difference in favour of China	...	1,484,000

The difference against China in June of this year is indicated by the following figures :—

		lb.
Deliveries of Indian and Ceylon teas		13,793,000
China	...	6,059,000
Difference against China	...	7,734,000

There has seldom been so complete a revolution in a trade and in public taste.

SUGAR IN FIJI.—Among the passengers who left Suva for Sydney by the S. S. "Waroonga" was Mr. Wm. Good, Sydney manager for the Fiji Planters' and Fruit Growers' Co-operative Association and Agency Company, who returns to the scene of his operations. Mr. Good takes with him some splendid samples of an accidentally obtained variety of cane which he has cultivated recently to some extent, and which is called the Muanawini (after the plantation). This new variety shows remarkable strength and vitality, united to good density, and is so straight in growth as to render less expensive many of the operations of cultivation and subsequent handling during conveyance to the mill. Doctor Kottman, Chemist in Chief to the C. S. R. Co., also returns from a visit of inspection to the scene of the Company's operations in Fiji, in reference to the disease which has appeared among the 'Honolulu' cane. The new Muanawini variety, referred to above, may meet the difficulty.—*Fiji Times*, June 21st.

PUMICE STONE.

The Belgian Consul-General in the Canary Island states that a very important mine of pumice stone exists on the Teneriffe Peak, of which the working was only started in 1888. The stone is found in that part of the peak called "the Canadas," at about 2000 feet above sea level, which has an area of some 6000 hectares, out of the middle of which rises the highest part of the peak. The Russian Consul at St. Croix bought this property of the Spanish Government in consideration of an annual payment for the pumice stone working. The Russian Consul has associated himself with a Belgian, and they under the firm styled Aguilar and Valcke, commenced operations in 1888, but it was only last year exportation was really started. At the Paris Exhibition the Consul-General states that this stone obtained a silver medal, and in view of the requirements of England, France and America, he believes it will develop a trade of great importance before many years. So far the Lipari Islands have practically furnished the world's supply of this product, exporting about 100,000 tons per annum. The Teneriffe stone being recognized as of excellent quality and its extraction being a much more simple matter than in the Lipari Islands, it follows that the price is much less. More capital will, however be wanted to extend the working operations. —*Chamber of Commerce Journal*, July 5.

TEA PACKING, BULKING, &c.

(By a Very Old Colonist.)

THE MINCING LANE TEA MARKET AND PROSPECTS—WEIGHING, BULKING AND PACKING OF TEA—TEA LEAD—MR. DENSHAM'S FACTORY—WHEAT PROSPECTS—RISE OF EXCHANGE.

London, July 5th.

Naturally, the first thing I did when I got to London was to visit Mincing Lane to see our brokers, Messrs. Gow, Wilson & Stanton, and learn from them all about the tea market and what was thought about its future prospects: at present the feeling is "bullish" and in favour of a steady market for some months to come. On inspecting some samples of tea after it was bulked in London, which I had seen before shipment, I was very much disappointed with their appearance: they did not look like the same tea at all they were much more dusty and broken than when they were shipped. On inquiring the cause, I was told, it was owing to the rough way in which tea is repacked in the tea warehouses after bulking. Mr. Wilson suggested that I should go to the warehouses and see the process of working a parcel of tea from beginning to end. Accordingly accompanied by Mr. Davies, who has taken much interest in the matter, I went to Cutler's Wharf to inspect the working of a parcel of our own tea ex "Chyebassa." It was first weighed gross, package by package, the weight being chalked on each; the boxes are then opened and a sample of each taken out for inspection. If they run even in appearance, at this point bulking might be saved, but in this case the samples did not run even in appearance, so the parcel was taken into the bulking room: there the top lead cover, cut up in sampling, was torn off and the tea turned out on the floor. The lead lining of the box generally comes out too, and is shoved back into it in a very crushed state. The tea on the floor is turned over several times with shovels—this is the method of bulking, machines have been tried for mixing the tea, but they have not been found to facilitate the work and have been given up. The empty boxes are then taken back into the weighing room and the tare is ascertained, by weighing each package. All the weighing is done in the most careful way, and the scales were tested several times whilst I was there!

Whilst the lot of tea weighed out well, there was a loss of about 1 per cent in the tares from inequality of the weights of the boxes. The tared boxes are then taken back into the bulking room. The tea after being again turned over is shovelled into them; and if possible inside the lead lining. When the box is nearly full a piece of gunny is placed on the top and a man tolerably heavily shod got on to it and stamped the tea in the box with all his energy. What wonder, then, that crisp tea is broken in the process and much dust made?

We adopt a similar process in packing in Ceylon, but it is done more carefully and gradually. By this way of packing we get more tea into the box than the warehouse laborers can without stamping it in. The stamping operation has generally to be done twice. There is no doubt in my mind that in packing the tea as we do in Ceylon, we are penny wise and pound foolish: we save a trifle in freight and lose a penny per lb. in price, owing to the deterioration in appearance from crushing. Unless we bulk on the estate I think no more tea should be put into the boxes than can be got by thorough shaking, then the warehouse people can get the same quantity into the boxes without stamping. No care can be taken in repacking to adjust the lead lining: if it slips into its place well and good; the tea goes into it, if it does not, it is crammed in; the tea on the top of it; and its want is supplied by sheets of paper placed next the wood and as the torn lead cover is useless, its place is also supplied by paper. The lids of the boxes being prized open with a chisel are generally much broken and are nailed on again anyhow. We are told that our tea does not keep well. How can it keep exposed as it is to the effects of a damp climate? I should say now that in my opinion the rough usage of our tea and packages in the warehouses is unavoidable. It is impossible to give the time necessary to repack as carefully as we pack: the remedy I think is in our own hands—either let us bulk on estates or pack in such a way as to admit of the tea being repacked without treading and stamping. With such enormous quantities of tea to be handled in the way I have described, time cannot be given to do the work carefully. The mischief, I should say, hurts us most with exporters: how can we expect them to buy and ship our tea with all the chances of deterioration from imperfect protection from the damp atmosphere? What is the use of packing tea in lead at all, if it is only for the voyage? The sooner some other way of hermetically packing tea can be devised or some method of making the tea lead adhere to the boxes when the tea is turned out the better.

Messrs. Gow, Wilson & Stanton gave me a piece of their tea lead laid on thick paper, which has been used by Mr. T. C. Anderson and is much approved of by the dealers.* If I can find out where it is made I will send out a supply, because it could be pasted on to the sides of the boxes before they are made up and then it could not be rendered useless by the men in the warehouses.

After seeing the bulking and repacking process, Mr. Davies took me to see Mr. Denshaw of Mazawattee celebrity. He kindly took us through his factory from top to bottom and showed us the whole process of blending and packing from beginning to the end. I was much pleased and interested in what I saw. All the tea is now, I believe, honestly described on the packages, and I think he has done much to push the sale of Ceylon tea. The quantity he buys and sells is very large: he has about 4,000 agents, and packs tea as directed for a large number of retailers who have their own names put on the packages. I was particularly struck with his blending machines and especially with his cutting and sorting machine: it cuts and sorts more evenly than any of our machines. The establishment is a very large one. The steam engines to work the machinery are at the top of the warehouse which is some six stories high.

This letter is intolerably long, but I do not care to apply the pruning knife to it or to rewrite it: so you must just try and make commonsense out of it. If the weather does not change very soon for the better

* A sample sent to us by Mr. Anderson some time ago was very favourably reported on by Messrs. Somerville & Co. We are not aware of the cost compared with ordinary tea lead.—ED. *T. A.*

the farmers will have a bad time of it and there will be very dear money before the end of the year to pay for corn, &c.—Yours truly, C. S.

P. S.—The price of silver is creeping up again. People are predicting a rise to 60d, which means a par exchange. It will be for a time a bad thing for the East. Capital invested there during the last ten years will be called up and sent back, and people will be afraid to send out money at an exchange of 2s., which they may have to get back at 1s 5d when the production of silver increases or when the demand for American currency is satisfied. Remember me kindly to all inquiring friends, especially those at the Mount. This climate is at present simply detestable. C. S.

QUININE, &c.

(From *C. F. Boehringer & Söhne's Report.*)

WALDHOF NEAR MANNHEIM, July 1st, 1890.

QUININE during the greater part of last month was very quiet and second hand holders accomplished the resolution to sell at 12½d per oz. In course of last week however, the market improved.

In 1880 Dr. Laveran of Paris reported that in Algiers he had constantly observed peculiar protozoeic organisms (Plasmodium malariae) in the blood of patients suffering from malaria fever. This discovery that was much disputed at the time has recently been confirmed by Dr. F. Plehn at the Moabit Hospital in Berlin, who in proof of it adduces the treatment of patients with quinine, the organisms in question gradually disappearing from the blood, and the patients therewith becoming convalescent.

COCAINE.—Just as in civilised lands general prosperity is accompanied by increased consumption of spirituous drinks, so in Bolivia and Peru the natives under such circumstances indulge more largely in coca showing. Such has been the case this year. Having got much better prices for their wool, the natives have consumed coca very freely, and the surplus of leaves for manufacturing purposes has consequently been small, and commanded high prices. Raw cocaine and cocaine hydrochlorate have nevertheless fallen. In face of the fact referred to, this decline cannot be expected to last, and either coca-leaves, must become cheaper, or cocaine quotations must be and of the former eventuality there is no prospect thatever at present.

A report in the Révue Chir. Thèr. recommends in case of croup the following solution :—

Cocaine hydrochlorate ..	...	1 part
Solution of Perchloride of Iron	...	8 ,,
Water ...	...	... 1000 ,,

A tablespoonful to be taken every two hours. For children the quantity of cocaine should be reduced by two fifths, and a teaspoonful administered every two hours with ice. This remedy removes the membranes and renders any operation (cauterisation,) unnecessary. —.

In course of the series of articles summing up the observations of European and American physicians concerning the subsidiary effects of the new remedies, and to which we referred in our April report, Dr. Falk of Berlin has since dealt with Antifebrine, Phenacetine and Methacetine.

ANTIFEBRINE (Acetanilid) the most frequent effect is cyanosis that occurs sometimes even after the smallest dose. The fall of temperature is often unexpectedly great producing even collapse, especially in typhus patients and children. Antifebrine frequently causes violent perspiration, and in many cases shivering fits. Unlike antipyrine it does not often affect the digestive organs, but on the other hand with children produces diarrhoea and inclination to vomit. Dr. Falk notices eleven cases of acute antifebrine poisoning the symptoms of which are faintness, giddiness, dread of death, palpitation of the heart, abdominal pains, vomiting, shivering fits, unconciousness and in some cases delirium.

PHENACETINE.—Judging by the comparatively few recorded observations, the occasional subsidiary effects of phenacetine are rare and unimportant. The most frequent appears to be excessive perspiration sometimes accompanied by shivering. Cyanosis and exantheme also often occur. By prolonged treatment with phenacetine, the patient grows so far accustomed to it that large doses become needful, and these are by no means free from danger.

METHACETINE is closely related to Phenacetine, but its subsidiary effects are much more disagreeable. It occasions most violent perspiration, and as often remarked at the same time also collapse and cyanosis, and great caution should therefore be observed in prescribing it.

THE NEW JAPANESE MINISTER OF AGRICULTURE AND THE TEA-MEN.

Mr. Mutsu has made it very plain to the tea-men who were so fortunate as to obtain a subsidy of 200,000 *yen* from the late Minister of Agriculture and Commerce, that he is not at all disposed to pursue the policy of official interference with trade. These gentlemen, probably feeling doubtful about the permanency of such a favour, sought an interview with Mr. Mutsu and asked what opinions he entertained on the subject, whereupon, according to the *Jiji Shimpo*, the new Minister told them that he was entirely opposed to official meddling with tradal concerns, and that, entertaining such views, he proposed, if not to cancel, certainly to greatly alter the Tea Company's charter. Subsidies and bounties were all very well, he explained, as means of giving a vigorous impulse to some particular enterprise and putting money into the pockets of favoured persons. But the impulse could only be temporary, while the inevitable consequence of such a system was to interfere with and check the sound development of trade, since the enjoyment of official assistance and protection by one set of traders effectually strangled competition on the part of men not similarly favoured, and thus, instead of encouraging private enterprise, official aid was ultimately fatal to it. With respect to the sum of two hundred thousand *yen* which had been granted to the Company and lodged for the uses of their business in the Bank of Japan, Mr. Mutsu explained that of course no question could be raised. But he told them that he should not disapprove of their placing the money with some sound bank where good interest was procurable. The tea-men have accordingly decided, we read. to transfer the money to the First and Third National Banks, where 7 per cent. is given on fixed deposits. They will thus be in receipt of an income of 14,000 *yen* annually, which, they expect, will meet their requirements.—*Japan Weekly Mail.*

MR. A. SCOTT BLACKLAW ON BRAZIL.

SÃO PAULO REVISITED.

DOM PEDRO SEGUNDO RAILWAY STATION—FASHIONABLE DRESSES—EMANCIPATION—DEPARTURE OF TRAIN: LEAVE-TAKING—COFFEE—BEAUTIFUL RESIDENCES—WANT OF CULTIVATION—GRAND SCENERY OF THE SERRE DO MAR PASS—A 100 MILE NAVIGABLE RIVER—COFFEE DISEASE IN THE CAMPOS DISTRICT—METRE GAUGE LINES—LEOPOLDINO RAILWAY COMPANY—EXPRESS TRAIN—SÃO PAULO TRAIN—MINAS AND RIO RAILWAY COMPANY—IN CACHOEIRA—CANE AND COFFEE—FROM BROAD TO NARROW GAUGE—COMFORTABLE RAILWAY CARRIAGES—BROAD AND NARROW GAUGE LINES—ABANDONED COFFEE ESTATES—A CENTRAL SUGAR FACTORY—JAWBREAKING NAMES OF STATIONS—A CONCESSION FOR A RAILWAY LINE—BITUMINOUS SHALE—SÃO PAULO STATION—HÔTEL DE FRANCE—CONVERSATION ON "GOOD OLD TIMES."

One reason of my long silence is that I have been for some time almost out of the bounds of civilization in the interior of Minas Geraes.

I started from Rio one cool September morning—the day just breaking when I got on to a tramway car which was to convey its load of passengers to the Dom Pedro Segundo railway station, for a train which was to leave for the Capital of the Province of S. Paulo at 6 a.m.

Arriving some half-an-hour before the time for the train leaving, one had time to enjoy a cup of warm black coffee, made with a strength which one only finds in Brazil—milk there was in abun-

dance, but such is the force of habit—after a long residence in these parts—coffee with milk seems a tame drink, compared with the black enervating beverage well-sugared—which is the "eye-opener" for everyone, rich and poor senator and beggar, in this part of the world.

While seated in the refreshment-room one is visited now and then by well dressed young men, who seem of the class employed during the day as clerks in wholesale houses or retail dealers' assistants—and is asked in a whisper to buy from the visitor the unexpired half of a return ticket to São Paulo. The ticket lasts for a month and has date of issue stamped on it. Negotiations are continued in a whisper, and the ticket may be bought for some ten or twelve shillings less than one can buy a single ticket for. From the numbers of those who present themselves afterwards one is inclined to think a better bargain could have been struck by exercising a little patience. The clandestine nature of the transaction leads one to believe that it is illegal. This however those who benefit by the affair do not care to inquire into. Tickets are not given out until a short time before time of train leaving, and the gates leading to the platform are not opened until that time. The waiting-rooms seem ample, but as the approaches are well covered, most of the passengers prefer waiting about the doors, no doubt looking for those whom they expected to accompany them or to see them off. There is not much pushing and crowding. The newsboys and shoe-blacks are kept outside, and your business with them is done before you enter. Luggage is a thing that does not bother the passenger much, for the day before the passenger intends to leave, it can be sent to an office of the railway department in the centre of the city of Rio de Janeiro and by giving particulars as to destination, and paying according to weight, he has only to present the card or receipt received at the end of his journey. Small parcels or such as do not inconvenience other passengers are allowed into the carriage.

While waiting for the train to leave, one is struck with the costly fashionable dresses of both ladies and gentlemen of the better class, but all are well protected from dust while travelling, the science represented by Worth is even exercised in the formation of ladies' "dusters" from unbleached linen or silk. Gentlemen protect their French-tailor-made suits by long over-coats of a material similar to the ladies',* and they put a white washable cover on their felt hats. Only 1st and 2nd class carriages are run; this being a fast train there are few of the latter, and what there are of varied colour, position, and dress.

Emancipation does not seem to diminish the retinue of coloured people of both sexes, which those included in the upper ten require when travelling in this country; a few German, Portuguese and Italian girls are seen accompanying families, but the bulk of lady's maids and children's nurses are taken from those who were formerly slaves. The dresses of some of these which before the 13th May 1888 were supplied by their masters and mistresses are not much inferior in either cut or material to theirs, and more costly than those of the same class in Europe.

No one seems to be allowed to enter by the regular platform entrance without a ticket, and I cannot explain why before the train leaves so many people are there to take leave of friends and these seem as many as the passengers, the carriages get filled up, and the stranger thinks he cannot get a seat, but the checking of the tickets soon undeceives him. Then the parting! Ladies give a kiss to each other on both cheeks and gentlemen embrace each other, some tears are shed by those on the platform, by-and-by the whistle of the locomotive blows, the train begins to move, white handkerchiefs are waved from carriage windows in reply to those on the platform, the speed increases, the beautiful suburban villas are passed, we pass through the wide expanse of fodder-grass fields, and off we are at forty or fifty miles an hour, and but for the splendidly convenient carriage arrangements we have here, one might fancy he was on one of the London and North-Western, the Great Northern, or Midland fast trains.

Gradually all settle down to our seats and morning newspaper. A great many small stations are passed, but the train does not stop until it has run for more than an hour, and this it does at a place called Belem (pronounced Bé-leng*). Here one can get coffee and some passengers stretch their legs on the platform. There is a refreshment-room; all take coffee; ladies and those who had not slept enough before leaving get it handed in at the windows. So as not to have to mention it again I may notice that this custom of coffee drinking is repeated every time the train stops: boys come with the cups on trays, the passenger helps himself and pays two-pence-halfpenny for a cup.

After leaving Rio the country is flat. The hills to the south of Rio where the Tijuca, the Corcovado, the Gávea, on the sides of all of which up to near the summit are some beautiful private residences, hotels &c. are gradually left behind, and in front we see the lofty ranges forming the Serra do Mar through the defiles of which the train has to pass. In this low country there is very little cultivation. Here and there are to be seen cane-fields, but the juice is turned into rum. The costliness of machinery for sugar-making prevents the farmer with small capital from making anything else of it, and the low price ruling for sugar for some years past prevents large capitalists from assisting by means of central sugar factories. Patches planted with mandioca, maize and beans are also seen. Land seems in the hands of people who do not care to rent it, or to sell it, else a great deal of it could be covered by market gardens, and small farms worked by European colonists, who could find a ready market for their produce in the city of Rio de Janeiro. With the exception of a few small dry looking knolls covered with grass, the soil looks as if it could grow anything suited for a latitude of 22½ degrees and a country having an average supply of rain distributed more or less all the year through of 120 inches. At Belem the ascent of the Serra do Mar commences. The gradient of the line is one in fifty, some thirteen tunnels cut out of solid gneiss are passed through. I am not poetical enough to offer to describe the grand views to be seen from many parts of this pass, but steep hills covered with virgin forest amongst which are trees of enormous size, and smaller shrubs showing flowers of every hue and filling the air with their fragrant scent, grassy hills, and grassy valleys, near and far are to be seen; while silvery streaks of waterfalls rushing over high rocks and disappearing, as if ending in spray, in the forest valleys below, and these brightened up by the sun; streaks of cloud showing pieces of mountain below and pieces above; showing a tremendous height for a short time to the Peaks, but these snowlike masses are soon to be dispersed by Sol's influence. These and a great deal more are to be seen and enjoyed, and then, as enjoyment heightens,

* In Melbourne there is an enormous consumption of "China silk" for male and female "dust coats" in summer time. The protecting dresses look, in the case of ladies, almost as nice as the dresses they cover.—Ed. *T. A.*

* And meaning Bethlehem: compare the English form 'Bedlam.'—Ed. *T. A.*

how delightfully cool and pleasant the air gets, as one gradually ascends to a height of 2,000 feet. After the last tunnel has been passed through and the train has gone sounding through the last rocky defile, a descent is made to Barra do Pirahy. Here we come to the Rio Parahyba which takes the drainage of a large tract of country; that on the north side of the Serra do Mar from near Santos 200 miles south of Rio to Campos 150 miles north. The Parahyba has also a large watershed on the north, as it receives the drainage of the high hills which have a *water parting* on the north towards the large river San Francisco, and also to those rivers which go to supply the river Paraná which goes to form the River Plate. The river Parahyba is navigable for about 100 miles from its mouth, and by it some of the coffee from Cantogallo, and St. Fedelis districts, and sugar from the Campos district find their way to a seaport. The hills on each side of it are covered with coffee plantations, and it is principally on these where the coffee disease has been playing havoc for the last few years. This is a disease or insect which attacks the roots of the coffee tree, in old districts. Government has tried what it could by sending specialists to study this pest, but as yet no cure or preventative has been found. Fortunately it has not as yet visited the new coffee districts in São Paulo and Minas Geraes. Barra do Pirahy, means the *bar* of the river Pirahy where it enters the river Parahyba, This first section of the Dom Pedro 2nd railway ends here, the trunk line goes north to the province of Minas, and receives traffie from many small lines of metre gauge formed by companies whose shareholders are, or at least many of them, people who live in the localities through which these pass. The main line is opened to the capital of Minas Geraes—OURO PRETO—altogether it has an extension of some 900 kilometres—750 kilometres (465 miles) of which is broad (5 ft. 3 in.) gauge, and 150 kilometres (97 miles) narrow 1 metre say 3 ft. 3½ in.* The gauge was broken after reaching so far (750 kilometres) into the interior for reasons which satisfied the Government, and which I do not care to enter into at present. It was the old question of "the battle of the gauges," and the narrow was victorious.†

From the Dom Pedro line about 3 hours' ride from here strikes off a metre gauge line worked by a powerful Company called the Leopoldino Railway Company. This line has a larger mileage than its parent the Dom Pedro 2nd, which is a Government line, and forms a network all through the northern part of the Province of Minas. It now threatens to take away a great deal of the traffic from its progenitor, having bought the Cantogallo Railway (gauge 3' 6") and made a branch to connect its old line with the latter, which has its initial station and terminus for unloading coffee and other produce at Rio de Janeiro, thus securing to itself all the goods traffic with which it formerly fed the Dom Pedro 2nd. Surmounting hills and crossing deep ravines seem nothing to the engineers of this Company, who do not hesitate on their metre gauge to locate on gradients of one in thirty-three (3 per cent) and lay down curves of three chains's radius.‡ The Leopoldino Railway has 900 miles open—cost of construction &c., £5,000,000.

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* There have been spent £12,000,000 on the 465 miles of broad and £1,200,000 on the 150 miles of narrow.

† The highest station on the Dom Pedro railway above the level of the sea is Barbacoua say under 3,700 feet and distant from Rio 235 miles.

‡ Three chains radius ! This means very slow speed or danger and rapid wear of rails from the effects of super-elevation.—ED. *T. A.*

The express for the main line passengers—those going towards Minas Geraes—and for the small feeder lines I have mentioned above leave Rio de Janeiro at five in the morning. The train with São Paulo passengers leaves at six: there is thus not the same scrambling and pushing for breakfast at Barra de Pirahy as formerly. The main line train leaves Barra de Pirahy before the other arrives. The distance of Barra de Pirahy from Rio opened 1858 is 67 miles and height above level of the sea 1,200 feet.

It is 8-30 a.m.; the refreshing air of the hills gives everyone a good appetite; there is a beautifully clean refreshment-room, and the table is loaded with good things hot and cold to eat, of which one may eat his fill, and wines &c. are for the ordering—the charge is moderate, and sufficient time is given to finish up with a cup of black coffee.

The line for São Paulo branches off here towards the west, but it is still the Dom Pedro 2nd or Government line the same gauge (5 ft. 3 in.) and passengers do not change carriages here, nor until they change into a metre gauge at the end of this line. The railway now follows the right bank of the Rio Parahyba, the train passes the small stations, and with few stoppages reaches Cruzeiros—where there is a junction with a railway (metre gauge) made and worked by a British Company, called the Minas and Rio Railway Company. The Minas and Rio line goes due north until it reaches a river, the Rio Verde, in Minas Geraes which is navigable. The districts through which it passes are more pastoral than coffee producing. Other lines are being made as feeders to it, and if it do not pay, it very soon will. The Company enjoys a state guarantee for the line at present open, and a provincial guarantee for some 200 kilometres of extension tills to be made. After leaving Cruzeiros and continuing on the side of the river Parahyba for other 14 kilos in due time we reach Cachoeira, which is the terminal point of the Dom Pedro 2nd on this side. We are now 165 miles from Rio, altitude 1,720 above sea-level—opened 1876. Passengers and goods have to be changed to the São Paulo and Rio railway, a metre gauge line. The valley of the Parahyba from Barra do Pirahy offers little variety: first we pass through some cane-fields for half-an-hour or so, the bulk of these canes are grown for a large central sugar factory which has a guarantee of interest from the Government of 6 per cent per annum. This ought to do good to the district, for the most of the coffee seems dying out and cane is growing very well on what were coffee plantations. Further up the valley there are fewer cane-fields, and the coffee fields, although not looking fresh and young, are not reduced so far as not to be able to pay their way. Nearer Cachoeira, but up on the hills, we pass some very well arranged coffee estates said to be bearing fair crops the present year, with plenty of young wood for the next. Being nearer some very high hills—one Itatiaiha said to be the highest in Brazil—6,600 feet, the climate is more moist, and has not suffered from the late drought, which has devastated whole provinces in the north and from the ravages of which few districts in the south have escaped. On the lands near the river cane is planted where coffee-fields were—more or less all along the valley. I may also mention that several metre gauge lines branch off to the left but on the right bank of the river. These lines go south towards the Serra do Mar and into a second valley of the Rio Parahyba which lies parallel with this some 30 miles to left and south of us and some of them have concessions from Government to enable them to extend to the sea port towns situated between Rio and Santos. The

cost of construction, as they get near the sea, must be heavy, as all along the coast from Rio to Santos the steep sides of the Serra seem to come right down to the coast. There are at present three of these lines working off the Dom Pedro 2nd—their milage is not great as yet, but all are being extended.

At Cachoeira we leave the nice roomy carriage of the broad gauge and enter that of the narrow. There is a difficulty at first in finding places for the small parcels, and convenient seats. As it is now afternoon the old hands look out for the side the sun will beat least on. We cannot venture on a cup of coffee until these arrangements are made. The new hand had better not ask the time for the train starting: if he do and be guided by his watch he will have some time to sit in an empty carriage. From Rio we have come on Rio time, here now we have São Paulo time, which is somewhat later,—some 15 minutes. Better for him to ask "How long do we wait here?" and he may look at his watch when the train starts, he will have time enough to look about, for changes of everything at break of gauges, even with the most improved railway systems, take time. Time! that is nothing to compare with the annoyance.

From here to São Paulo the metre gauge line belongs to a company having its head office in Rio de Janeiro, and the capital was raised in this country. It was opened in 1876 and has paid fairly well to the shareholders.* For goods traffic from Rio to São Paulo it has to compete with the line of steamers between Rio and Santos. Passengers, even those to Santos, who have by steaming this route to stay a night in São Paulo, and go by train some three hours' journey to Santos next day, prefer it, for in some seasons the sea voyage between these two places Rio and Santos is far from pleasant.

We have come out of luxurious carriages fitted up with all sorts of comforts for the traveller which our American cousins can invent, and we enter others less roomy no doubt, but clean, neat and comfortable. The extra heat we experience is not *all* owing to the lowness of the roof, but the sun is beating right down on us, and it is the hottest part of the day, and the small windows which only open half-way would not inconvenience us much, if we had entered the carriage at 6 o'clock in the morning. There is width enough in the seats, for the broad gauge held two on each seat with a passage down the centre, making four passengers in the breadth of the carriage; here you have two passengers on one seat at one side, and one passenger on one seat at the other, the single seats extending one half-way down the carriage on one side and half on the other, the double *vice versa*, and although the passage in the middle has a quick turn half-way down the carriage to suit this arrangement of seats, there is room enough for seats for gangway and all. The facility with which the backs of the seats can be turned to enable two people, if on the single, and four on the double, to have a quiet *tête-à-tete*, is a good arrangement; if you don't like your face to the engine, turn the back of your seat and you have your back to it. The lavatories are kept as clean on one line as on the other. On this line where curves do not seem to be less than six chains radius they could easily have higher roofed carriages which would give better ventilation, and enable windows to be open their full height.* They could be opened by pulling down instead of pushing up. Do not let us growl: in a new country a metre gauge railway is not to be despised. The metre gauge has been such a success that here they will have no other, but I do not say that it is right to have *two* gauges in any country [The question of gauge is largely a question of traffic, but break of gauge means increased cost of working, with inconvenience and danger.—ED. *T. A.*] For through traffic the break of gauges is the greatest annoyance imaginable, and the saving in cost of construction does not compensate for loss of time—*first* in the slowness of the trains, and *second* in the time required for changing from the waggons of one line to another, entailing risk of damage to goods, delays and discomfort to passengers. The 5 ft. 3 in. gauge lines run up to 60 kilometres per hour, while the narrow 3 ft. 3½ in. seldom exceeds 30 kilometres, and it is a very fast train that will run 40 kilometres: indeed I think there is a regulation which makes it punishable for a driver to exceed the latter distance let his train be ever so late. They tell me the express on this line runs 40 kilometres per hour. With the exception of the Government line in the Province of Ceará, constructed under directions of Engineer Charles Morsing, this is the best made metre line I have been on in Brazil. Although your 5 ft. 6 in. is an enormously wide gauge, now that you have a good extension of it, and through the most difficult part of your country, you should stick to it. [No fear of that. Apart from all the inconveniences of break of gauge, experience in India has conclusively proved that any gain on construction is rapidly lost in the higher proportionate cost of working narrow gauge lines.—ED. *T. A.*]

Economy in the construction of metre gauge lines here has reached a point as fine as it is possible to cut it. £3,000 a kilometre is the maximum on which guarantee is given by the Government, and the applicant for a concession must prove that it will pay 3 per cent, *i. e.*, if the line should not pay 3 per cent the quota to be paid by Government would not exceed 3 per cent on capital guaranteed.

A pretty long stretch of line to connect the city of Rio and that of Campos along ground similar to your lowcountry and a gauge of 3 ft. 6 in. was contracted for at £1,920 per kilometre; the work included everything but rolling stock. Gradients not over 1 in 100 and minimum radius of curves 200 minimum or 10 chains radius. Bridges above 12 feet to be of iron, stations of stone or bricks, and covered with tiles platforms of cement, &c. Rails steel 45 lb. to a yard—all was finished to the satisfaction of Government, and it is said the contractor made a fortune on it.

But to return to our journey towards S. Paulo. Leaving Cachoeira, we pass through what had at one time been an important coffee producing district, for we see numerous abandoned coffee estates, and cane struggling to give a fair crop from the already washed and exhausted soil. Government have tried to improve agricultural matters, by giving a guarantee to a central Sugar Factory beside the Lorena station. The factory has been working for three years, but the Government have had to assist in paying the dividend to the shareholders. This will gradually be remedied, as it was owing to the planters' not planting sufficient cane; they being uncertain if the price the Company offered would pay them for cultivation, and they not being sure if means for transport would be provided when the cane was ready for cutting,

* Length of line 232 kilometres—146 miles—7 per cent guarantee from State on £1,000,000.—All was spent on construction,

* Since writing the above I have been told the low roofed carriages are few in number, the others have high roofs with double ceilings, 7 windows opening full, and downwards.

judging by the number of tramway lines seen, one would suppose this fear on their part no longer existed. The factory is a large building close to the railway, and is fitted with first-class French machinery and appliances, for the turning of the produce of the cane to sugar and rum.

After Lorena we pass some stations with names quite as "jawbreaking" as the designation and title of some of your Sinhalese nobles. We have first "Guaratingueta," pronounced G-wara-tinge-tah. We pass the stations Apparecida, and Rozeira, suggesting the formerly devoted labours of the brotherhood of the Society of Jesus, and then we have Pindamonhangaba—pronounced Pinda-monyangah-ba. The name might be associated with the last two as having reference to the lower regions, but it is not so. It is an Indian name and looking at its termination has something to do with the nsme of a tree. The next station is Taubaté: here there is a considerable town, and no fewer than two hotels close to the station, and as the *down* train passes about breakfast time, and the *up* during the afternoon, passengers are notified in ornamental lettering on the walls, that they may enjoy a "square meal' at reasonable rates, and the railway arrangements admit of those who are inclined to take breakfast or dinner." We did not avail of the invitation so prominently offered to us to dine on paying, first because we did not wish to altogether destroy the enjoyment of what would be provided for us in the Hôtel de France in San Paulo—now *run* by an old accquaintance, Guilherme Lsbeis, a German by birth who was a particular friend of our lamsnted G. A. C., when he made his pleasure trip here in the seventies, and second we had been presented—handed into the carriage window—from the platform in Rio with a sandwich loaf by a friend who is a partner in the large confectionery and dinner supplying establishment of Pascoal in Rio. Now this is not the sandwich loaf you mean—made of the closegrained material the product of fermented flour and water only, but a loaf which had besn made like a roly-poly, the dough had been rolled out and beautiful slices of legitimate copeland applied formed into a loaf and cooked or fried all in one pisce in the oven. This was simply delicious, and it had been broken on several times before we reached Taubaté.

An English gentleman has a concession for some 250 kilometres of railway line—on metre gauge and guarantee of 6% on the capital—which is to connect this town with that of Ubatuba on the coast between Rio and Santos. Already the line has been surveyed, and he expects soon to raise a company to carry out the construction. Another has a concession for a line to go direct north from here into the Province of Minas Geraes. By this means the produce of a large tract of country which has to find a seaport by going a roundabout way to Rio or to Santos, and suffer knocking about and delay at each change of gauge, will be immensely benefited.

Here also at Taubate are layers close to the surface of bituminous shale, from which, if properly worked, paraffin and lubricating oils could be extracted. This has not altogether escaped the attention of some enterprizing British and American gentlemens, and it to be hoped that after it has passed the experimental stage a large Company may be formed to develop this industry.

We stop in passing at a large town called Jacarahy with a large bridge in the middle of ths town crossing the river Parahyba. The line continues on the right bank of the river, but some 10 kilometres farther on near the station Guarerema we cross to the left, and passing through some heavy cuttings we enter on the watershed of the Tiete, which runs westward towards the tributaries of the River Plate.

As I have already mentioned we have been running parallel with another valley of the Parahyba separated from us by a range of hills on our left to the south of us and north of the Serra do Mar. This valley has its commencement north-west of the range of mountains in which we passed through the 13 or 14 tunnels, which I have mentioned on the Dom Pedro Segundo line after leaving Rio. Its sides are formed on the south by that southerly extending barrier the Serra do Mar, and on the north the south side of the range of hills which jointly with the river have been our companions for some eight or nine hours.

The head waters of the noble river are collected in this rugged valley. The river which they form runs north in a winding and rocky course, catching up the dark waters of many a mountain stream, draining thousands of acres of black and impenetrable looking virgin forests on the north side of the Serra do Mar, whose steep and rocky sides do not admit of cultivation of any kind; then it takes a bend to the north, issuing through many ugly-looking gorges and near where we are, Guarerema takes its eastern and southerly windings along which we have been passing since we had breakfast at Barra do Pirahy.

There are not many more stations to pass, soon the lamps are lighted in the carriages and São Paulo is reached about 7 p. m. The station is large, commodious and well lighted up with gas, from the supply furnished by an English company which has a concession for the lighting of the town, for a number of years. But the station is at an out-of-the-way corner of the town, and there are no good hotels near. The passengers who have no luggage rush to the tramway cars, and many of the knowing ones who have join them after giving their despatch note to some known porter. I and my companion are not so sharp, for by the time the parcels are all on the large table, and we notice all ours are in one heap by themselves, the tram-cars have got filled up and are gone. The cabs here can take only small things, so we have to engage a portsr whose number we note. Cabby knows Hôtel de France well, and behind a pair of beautiful trotting mules we rush through well lighted streets past brilliantly illuminated shop fronts. The cab has scarcely time to stop when the door is pulled open, our bundles are seized, and before we have time to collect our wits the retiring appropriators of them are disappearing up a large staircase; but on our alighting in the porch a polite waiter informs us we are at the Hôtel de France, that our rooms are ready, and that on our intimating dinner will be served.

Guilherme Lebeis the present proprietor had not seen me for some eight or nine years, but he was prompt to recognise an old customer. He had been "mine host" for some years on pretty frequent occasions in the provincial town of São João do Rio Claro—generally known as Rio Claro,—now an ornsmented and flourishing town some 120 miles farther into the interior. The regular dinner hour had passed, and there were very few who had come here of our fellow-passengers; the hotel owner was thus free to entertain us in conversation on "the good old times," on the changes which had taken place, the comings and the goings, and alas we had to mention the names of a good many who had gone to another place. Then railways had now spread themselves ovsr the large elevated plateau which forms the Province of São Paulo. The number of coffee trees on a large plantation could oftener at that time—1873 to 1880—be re-

presented by five figures. Now nearly all fazendeiros count their hundreds of thousands and some exceed the million. Calculate ye old hands three hundred trees to the acre, calculate the high price of coffee and most of it cultivated by slave labour assisted before 1887 by only very few European colonists' families, and you will not be surprised that many who were formerly reckoned poor aro looked on now as millionaires, and many who were then the most obstinate of slaveholders had latterly been amongst the foremost of emancipators who has given unconditional liberty to their peoplo beforo the law of 1888 compelled them to do so. One can scarcely believe the rapid strides tho Province has made in such a short number of years. Hear it oh ye stubborn use-and-wont permanent Secretaries of the British Colonial Office, and wait-a-bit Dictators of British Crown Colonies: the moving cause is Railways.

It did not require the wine to inspire our "after dinner" chat, but by-and-by, I am nudged by my companion, who reminds me that this is his first visit to São Paulo, and he wants to see some of the town. Unfortunately it was past 8 o'clock and all shops were shut, the streets were lighted only by the gas lamps, and as we had to leave by train in the morning early, we soon returned to the hotel. We could not spare a day for sight seeing and visiting old friends, as the other members of the Commission on which we were engaged had preceded us into the interior some days before, and were waiting us there.

The rest of our journey must remain to be described in my next. A. SCOTT-BLACKLAW.

THE ORANGE GROVES OF FLORIDA.

There are many beautiful things amongst the wild plants and shrubs, some of which are occasionally seen under cultivation, and are known to English gardens also. These include Lantana crocea, Ipomea Quamoclit, two or three species of Opuntia; three kinds of Fan-leaved Palms, one of which resembles Chamærops Fortuneii very closely, and is very abundant; the others grow to heights of 20 feet and upwards, and are very pretty when seen growing in large clumps. Callicarpa purpurea forms a fine object, laden with its purple berries, when seen in quantity. Magnolias form large trees, but none was in flower at the time of my visit. Yucca filamentosa is occasionally found. Oranges grow wild in some parts, but they are sour and worthless. Quercus coccinea (the Scarlet Oak) is very fine in December, when its leaves put on their bright tints; and two or three other species, which are evergreens, make very fine trees in some parts of the country, but where the sand is of very poor quality they are generally found only as low bushes, while underneath them the sand, if too poor to grow grass, is covered with a finely cut leaved species of Lichen, similar to what we sometimes find on Apple trees in England. Opuntias also grow in these places, and their roots extend 10 and 12 feet horizontally a little below the surface, while the whole plant may not be more than 6 inches high. In the more moist parts some of the grasses are very pretty, but they were all dried up when I saw them, and in this state they are often mischievously set on fire, causing wholesale conflagration. A few acres of a Pine forest when on fire forms at night a weird and strange sight, but it is not often the trees take fire from the burning grasses, unless they have been previously injured or are decayed; but the grass and herbs are cleared off for a time only, to spring up again after the first shower. These forest fires do a great deal of harm by consuming all the decaying vegetable matter that would otherwise go to enrich the sandy land.

Many of the wild flowers of Florida are pretty, and belong chiefly to Compositæ. Very few plants wild in Britain are found, but Pinguicula vulgaris is abundant and beautiful. Two Ferns similar to Pteris aquilina and Osmunda regalis, a Drosera, which I believe to be D. rotundifolia, a Rumex resembling R. acetosa, a Polygonum, perhaps P. persicaria, and Sphagnum Moss, were all that I observed. Poa annua was nowhere to be seen, and Florida has none of our worst garden weeds, although I do not consider their own any improvement.

In the best vegetable grounds Cane-grass is very abundant, growing in the manner of our Couchgrass, but it is far stronger, the underground stems being as thick as lead-pencils, and the stems 18 inches in height. The creeping roots of this grass soon fill a piece of ground, if left alone for a time, when it is peaty and moist. Another species of grass has stems which ramify on the top of the sand, and grow at a great pace until they reach a length of 30 feet, rooting, and sending out sideshoots as they advanced, and in moist places this soon covers the sand completely, if left undisturbed. A kind of grass, or Sedge, called the Sand-spur, which seeds very freely, is also very troublesome. It derives its name from the fruits, which are covered with sharp spines, and have an uncomfortable trick of getting into one's boots, and other like places, and never let go their hold without much persuasion.

The timber is chiefly composed of Pinus cubensis, a coarse-grained hard wood, containing a good deal of turpentine. Another species of Pinus, but which is very local, is P. inops var. clausa, whose cones remain on the trees a great number of years, and give them a very peculiar appearance. Taxodium distichum is abundant in some parts, and is always found growing in the water, or close to it, sometimes it may be found where the water is 3 or 4 feet deep, but in such positions it is generally in a state of decay. The curious excrescences, or outgrowths, from the root, called "knees" in England, are abundant, and are dangerous to small craft. This tree gives the largest timber of any that I saw, and some specimens measured from 10 to 12 feet in circumference, while the species of Pinus are not found of more than 5 feet in circumference. I measured a dead tree of P. cubensis which was 102 feet high, and 4 feet 8 inches in circumference at 4 feet from the ground. P. inops does not grow so ta or so large as this. Evergreen Oak is occasionally lleen of large size, but the wood is so hard they cannot work it up. It is called Live Oak, to distinguish it from Quercus coccinea, a tree which is also occasionally seen of a good size. Other kinds of timber, Hickory, Ash, and Cherry, are found in some parts of Florida, and the Red Cedar, which is so much used for making pencils; but I found on inquiry that this is scarce in large size, although often used as posts for fencing.

The chief drawback to the trade of the country is the bad state of the roads, which are so loose that it is impossible to walk any long distance, and riding or driving becomes a necessity; and there are no means of improving this state of things, for not a stone of any kind is to be seen, and in the larger towns the footpaths are made of cement, and in some instances of shells, which are spread on the sand, the streets being sprinkled with a water-hose, which causes some little improvement.

Among wild animals, deer, rabbits, tortoises—called by the negroes "gofers"—wild cats, opossums, skunks, &c., are more or less abundant; and away in the swamps bears and panthers are occasionally met with; snakes are abundant, and for the most part harmless. Doves, turtle-doves, quails, butcher-birds, mocking-birds, hawks of several kinds, buzzards, water-turkeys, herons, woodpeckers, storks, &c., and some rarer kinds, are found in the uninhabited portions.

Anyone intending to settle in Florida as an Orange-grower, &c., should be previously well instructed in the first principles of horticulture, as the most of the persons engaged in Orange growing out there have vague ideas as to what is required, and it is difficult to get from them any definite information. On the whole, I found the country very enjoyable and healthy; but intending settlers should be very careful to get on the highest land, towards the centre of the State. A good amount of capital is required, in order to get good returns, as it costs quite 50 per cent. moor for

food than it does in England, and many other things are dearer than here. The work is mostly performed by negroes, who are paid at the rate of 5s. 2½d. per day, and they are not, as a rule, very industrious folk. There is a fair amount of English society in some parts, and a good many Americans from the North, who in many instances live in the Northern States during the summer.—W. H. DIVERS, Ketton Hall, Stanford.—*Gardeners' Chronicle.*

THE USE OF INSECTICIDES.

The following details are taken from current American publications:—Professor Lake's experiments upon spraying Apples and Pears with London Purple for the Codlin moth, give some interesting results. Four sprayings were given, the last one being August 12. The treatment had a decided benefit until "the latter part of August, but from that time to the date of picking (October 1), the affected fruit increased so rapidly, that the final results on some trees of both sprayed and unsprayed were about the same. We had considered it unsafe to spray later than August 12, but the results would indicate that had we omitted the first spraying, and given another in the latter part of August, effective work would have been done." The first spraying immediately after the falling of the blossoms, seemed to accomplish little or no good, as observations made for two weeks after the first spraying failed to give any indications of the moth's work in the fruit of either sprayed or unsprayed trees." The Codlin moth must behave differently in Oregon than in the eastern states. The summary of the season's work is as follows:—"1. Early spraying—just after the blossoms fall—is useless. 2. A mixture of 6 oz. of London Purple to 100 gal. of water is better than a stronger one. 3. The mixture should be kept thoroughly stirred while being used. 4. Young and vigorous foliage is more susceptible to injury by burning from the application of arsenitiee than is older or less vigorous foliage. 5. Spraying as late as September 1, or even later on winter Apples, is desirable as far as fighting the moth is concerned. (There may be some danger in such late spraying, however, and this is one phase of the subject for next year's work.) 6. All fallen Apples that are affected should be destroyed daily. 7. The cost per tree for each spraying will average, in small orchards, about 3 cents. In larger orchards it would be less." *Bulletin No.* 3, *Oregon Experiment Station.*

Woolly Aphis.—Woolly aphis upon Apple trees was destroyed by a spray of lye-water—1 lb. of concentrated lye to 3 gal. of water. Kerosine emulsion was not found to be a satisfactory remedy.—*Bulletin, Oregon Experiment Station.*

Fighting Codlin Moth in Iowa.—Mr. Gillette controlled a small and isolated plantation of Duchess Apples, upon which careful experiments were made with London Purple and water, Paris Green and plaster, and carbolished plaster. In every case treated trees gave better fruit than untreated trees. The poorest results were obtained from the use of carbolised plaster, there having been a saving of 34 per cent. of fruit liable to injury. "This remedy could hardly be recommended, even if very good results were obtained, as it does not kill the insect in any of its stagee, but simply repels the moths, which seek the fruit of neighbouring trees, on which to deposit their eggs." Next best results were obtained from the London Purple, which saved about 80 per cent. of the fruit. One pound of poison was used with 128 gallons of water; some of the trees were sprayed once, and some twice. Best results followed the application of Paris Green and plaster. This saved 94 per cent. of the fruits liable to attack. "I believe that no one has ever reported on a remedy for the Codlin moth, which, by careful counts, has shown as good results as this." One pound of Paris Green was used with 100 lb. of plaster. This was thoroughly dusted over the trees, from one to three times. Mr. Gellette thinks that two applications are ample. "Poisons cannot be applied by this method as rapidly or easily as by means of a force-pump, but it has the advantage of costing nothing for apparatus, and the trees can be dusted quite rapidly from a waggon, by driving on the windward side of the row. This method of applying the poisons would be especially useful where only a few trees were to be treated, and where it is thought that a pump cannot be afforded." These results with the dry poison are certainly remarkable, and they indicate that a distributing-machine like the lately perfected Strawsonizer, of England, may yet find use and favour in our orchards. At all events, these experiments afford a new proof of the efficacy of arsenites in the combatting of the Codlin moth. *Bulletin No. 7, Iowa Experiment Station.—Gardeners' Chronicle.*

STRAWBERRY LEAVES AS TEA.—A new industry has sprung up in Germany with the young leaves of the wild strawberry plant. Having been carefully dried, they are used instead of Chinese tea, and are said to approach that beverage very closely in taste. An addition of young bramble and woodruff leaves is said to add to the excellent flavor of this most inexpensive of teas.—*Manchester (Eng.) Grocers' Review* in *American Grocer.*

PISCICULTURE.—Some time ago Mr. Le Mesurier of the Ceylon Civil Service, was deputed by his Government to proceed to Madras and secure the fry of the *Laboe*, a species of fresh water carp, and of the *Gourami* native of the Malaccan Islands, and introduced into Madras by Sir William Denison while Governor of the Presidency. The fry was wanted to stock the fresh waters of the colony with. This mission Mr. Le Mesurier successfully accomplished with the aid of Dr. Thurston, taking back with him a number of fry not only of *Labeo* and *Gourami*, but of other fish much esteemed as food. The introduction has evidently been successful, for we find that Dr. Thurston has been requested by the Ceylon Government, through the local authorities, to procure and forward the fry of the *Cirrhina Chiirrhosa*, or "white carp."—*Pioneer*, June 9th.

THE writer of an article in the *New York Forum* entitled "When the Farmer will be prosperous," looks forward to an early date when the United States will have to import large quantities of which to feed its ever growing population. The acreage per head of population necessary to produce cereals and other agricultural produce required for home consumption is calculated at 3·15 acres. In the ten year's preceding 1884 the cultivated area had been extended at an average rate of something over eight million acres a year, the result being that at the close of that period there was a surplus of 20,248,000 acres under cultivation beyond the aggregate required according to the above calculations. But during the succeeding four years the rate of extension fell to a little under three million acres a year, so that the surplus area was reduced to 12,888,000 acres between 1888 and 1894, the writer is of opinion, the rate of extension will undergo a still further diminution, but taking it at three million acres per annum, and the ratio of increase of population at 27 per cent per annum, there will at the end of the period remain only three acres of cultivated land per head of population, instead of the required 3·15 acres. To keep up this cultivated area to the requirement of the growing population would necessitate an annual addition of six million acres of arable land, and the writer does not believe that it can be found, though of course higher prices would bring inferior soils under the plough. This is, indeed, good news for both the British farmer and the Indian ryot.—*Indian Agriculturist.*

GOLD MINING IN SOUTH AFRICA.

A correspondent writing from Barherton says :—

"These fields ('Dekaap'—or Barberton) though older are of very mnch less importance than those at tbe 'Rand' (or Witwaters Rand) which have sprung so wonderfully into prosperity—and now lately are under such a deep wave of adversity. This gold mining is a wonderful sort of husiness, scarcely business at all: it is a mass of speculation and ma'œevring on a thin basis of actual mining. I often wish I was in some other line. I was not sharp enough to make a lot when the first rush occurred, and money could have heen made; and since then, the reaction has been oontinuous and severe. Everything is very dull, and no one can predict when the next wave of prosperity will be. Capital seems to fly ahout the world like a swarm of insects, alighting now on one industry or locality and now on another, alternately helping and blighting. At present South African mines are out of favor with capitalists, but I suppose their turn will come again, when they increase the output of gold. That is the great thing, and it takes years of work and experience like building up any great business."

NOTES ON PRODUCE [AND FINANCE.

What is a Blended Tea?—The action of the Ceylon Association in prosecuting tea dealers for selling tea not correctly described has caused a flutter in the retail trade. One correspondent asks :—"May I ask what is a Ceylon blend?—or, as we are now learning what some so-called Ceylon hlends are, I will vary the question, and ask—What should a Oeylon blend he? Should it be a blend of various Oeylon teas, or a blend of which Oeylon tea forms a prominent or principal part? Men are going round and trying to frighten grocers by saying that if they sell as a Oeylon blend an article containing any other tea than Ceylon they can he prosecutod. Now, the decisions in the cases of Paget and Piggott and in Kearley and Tonge were given upon issnes differing from that now raised. For years grocers have safely sold as an Indian hlend teas that were Indian only in part. If the word blend protected the mixture of Indian and China tea why should it not protect the mixture of Ceylon and Indian? Although the scare which is being created is ostensibly in the interests of Ceylon planters, it may be questioned if it will ultimately prove to be so. Another point raised in Kearley and Tonge was that this firm did not import their own teas though their label said they did. Bnt surely it is not an indictable offence to style oneself an importer. Is every aspiring baker, or notable porkbutcher, or enterprising milkman, or worshipful greengrocer, who on the strength of having purchased a dozen pounds of tea from a neighbouring grocer calls himself 'an importer of tea' to he hauled before a magistrate for this heinous offence? Tbis is mighty fine for the lawyors, but I hope you, sir, will protest against this dangerous and revolutionary doctrine. Should not theso assertions be taken in a Pickwickian sense? It is something new for tradesmen to be called on to provo their assertions or be mulcted £10, and costs £5 5s." Another correspondent writes to the *Grocer*:—"In consequence of the prosecution of two firms of wholesale tea dealers at the instance of the Ceylon Tea Growers' Association (Limited), under the Morchandise Marks Act, for misleading descriptions of Ceylon packeted teas, there is a deal of misunderstanding among grocers as to what they should and should not soll. I am selliug a packeted tea bearing the following description :—'Ceylon Blend.' The firm from whom I buy the tea guarantee it to contain 70 per cent. of puro Ceylon. Taking it for granted that such is the case, can I be convicted of false description under the aforementioned Act?"

Enemies of Tea and Coffee.—Dr. Mendel, of Berlin, a well-known physiologist, has mado an attack on coffoe and tea, especially the former. So far from believing that two penco off the pound of tea or coffee will reduce the "drink bill," he contends that, by

permitting the poorer classes to buy more of these stimulants, the cheapness will conduce to the spread of what he has described as "coffoe inebriety," a form of intoxication which very frequently leads to the more alarming, but not aotually more dangerous, form produced by alcohol. Dr. Mendel does not say much abont tea but he infers a great deal. Eminent physiologists must attack somebody or something, otherwise their oocupation would he gone. Tea and coffce, like other good things, require to ho taken in modoration. The increase in the consumption of tea vexes the souls of believers in tho good old days of John Barleycorn in this country. A correspondent of the *St. James's Gazette*, who might—hy reason of his sentiments—be a brewer or distiller, writes as follows: —"Any one who watohed the recent procession, especially the teetotal varieties, must have been pained to notico the stunted forms and poor physique of the greater part of the crowd composing them. Stalwart men were conspicnous by their absence, and the greater numher would fail to fulfil even the present very easy conditions of military service. A hostile foreigner would have rejoiced at witnessing what, if not checked, may prove the ruin of England. Though muoh has been done for them by increasing wages and lessening hours of labour and paying more attention to sanitation, still the habits and mode of living of our town population fully account for their degeneracy. They marry while in their teens and rear their squalid children on tea. Tho women especially drench themselves with tea to the ruin of their nerves and digestion. Though no one is more willing than I am to admit the evils of intemperance, I firmly believe that tea has done more harm to the working olasses than beer, and nearly as much harm as spirits." The inference that our national decadence has set in and that we are beooming a nation of dwarfs because we drink too much tea, is droll.—*H. and C. Mail.*

THE PRECIOUS METALS.

The idea propounded by a correspondent, that the supply of silver in the world and its annual production are limited rather than excessive, is novel and startling. Most of us have been under the impression that nations on the Continent of Europe were embarrassed to know how, without enormous loss, they could dispose of the accumulated silver which they had demonetized; while recent legislation in the United States was undoubtedly promoted in the interests of the "Silver Kings" of Nevada, who found their product depreciated by the demonetizing policy in Europe and over-production in America and Australia. It would require more and better authenticated facts than have been yet adduced to lead us to abandon this conviction, and the additional one that when the present boom caused by the proceedings at Washington has abated, the value of silver and that amount of "exchange" which depends on it will revert to the standard which recently prevailed. While the production of silver has largely increased in the past forty years, that of gold does not seem to have much exceeded an average of about twenty to twenty-five millions per annum. This limited production of an article which in Britain has hoen long the sole standard of value, and which has now been adopted as such by many of the leading Continental nations, has naturally led to an appreciation of gold over silver, far beyond the proportions which once prevailed, and which bimetallists fondly hope they oan restore, of 1 to 15 or thereabouts. Mulhall, in his "Progress of the World," published in 1880, brought together what we suppose are fairly accurate figures regarding the world's accummulated wealth and the annual supply of the precious metals, at which it may be interesting

to glance. Under the heading " Gold and Silver," it is stated :—

" These two metals, which have materially aided the cause of progress, have suffered such mutations of fortune in the nineteenth century, that it may be worth while to study their antecedents. Michael Chevalier is of opinion that at the period of the discovery of America the total amount of gold in Europe was only £12,000,000, and of silver £28,000,000. At that time on ounce of gold was worth ten of silver, but as soon as the conquest of Mexico and Peru by the Spaniards poured a flood of silver into Europe this metal lost one-third of its value. In the seventeenth and eighteenth centuries gold stood for fifteen times the value of silver. A new epoch occurred with the discovery of gold in California and Australia, but silver never recovered its position as a precious metal."

We can remember the fears entertained of the depreciation of gold when California and Australia began, each of them, to add nine or ten millions annually to the supply of gold in the world. But such was the simultaneous expansion of commerce that no such result followed, and gold has retained a quality of permanency most valuable in an article adopted as a standard or representative of value, which really rests in the goods which nations or communities barter. Mulhall gives a table, the figures of which show that since the era of Columbus, 1492, the world's wealth in gold has risen in value from £20,000,000 to no less than £1,120,000,000 in 1880. The progress of silver in the same period of nearly four centuries has been from £40,000,000 to £1,612,000,000. The aggregate increase has been from £60,000,000 to the enormous value of £1,832,000,000. We quote again ;—

"During 300 years of the Spanish dominion in America the mines of Mexico, Peru, and Brazil yielded a little over £1,200,000,000, of which three-fourths were silver. Since Marshall's discovery of gold in California (1848) there has been an increase of £950,000,000 in precious metals, as follows:—

	Gold. £	Silver. £	Total. £
United States	282,000,000	74,000,000	356,000,000
Australia	252,000,000	...	252,000,000
Spanish America	20,000,000	160,000,000	130,000,000
Russia ...	93,000,000	3,000,000	96,000,000
Other countries	11,000,000	55,000,000	66,000,000
	658,000,000	292,000,000	950,000,000"

Mulhall calculates that the production of the two metals had, in the case of gold, gone down from £27,000,000 per annum in 1852-1861 to £16,000,000 in 1872-78 ; while the production of silver had risen from £8,000,000 per annum in the former period to £12,000,000 in the latter. Since 1848 the calculation was, that notwithstanding gold had doubled in quantity and silver increased only one-fourth, the purchasing power of gold was only 20 per cent reduced against 33 per cent depreciation in silver. Increased production of silver and the demonetization of the metal both contributed to lower the value of the secondary precious metal. To meet the wants of increasing trade, coinage had in the thirty years trebled, the figures in 1878 having been, for

Gold coins	£959,500,000
Silver ,,	£620,000,000
Total...	£1,579,500,000

To meet the demand for coinage, stocks of the precious metals in excess of the yield of mines had been drawn upon. But a process of melting down coins goes on continually ; and it was known that between 1840 and 1880 India had absorbed £105,000,000 of gold and £238,000,000 of silver. Were the precious metals hoarded in India cleased, the value of gold would be somewhat, and that of silver considerably affected. Mulhall calculates that about one-sixth of the bullion of the world is locked up in banks, mainly as representing paper in circulation, of course. All the nations of Europe import bullion except Russia, which possesses gold mines, the produce of which does not seem to be very accurately reported. And in dealing with imports and exports of bullion and the balances in different countries, we must never forget the large sums of money carried by passengers to and from all parts of the world. If the silver is, as our correspondent tried to make out, not over-abundant but the reverse, conditions must have greatly changed since Bismarck stopped the sale of the German demonetized metal because such sales were being made at a loss of 15 per cent. American legislation, demanded by the farmers, who believe that plenty of currency means good prices, as well as by the owners of silver mines, has, for the time, given silver a boom ; but bimetallists and others must not " lay the flattering unction to their souls" that this is likely to last or that silver is likely to recover its former relation to gold.—The extract from the *Encyclopædia Britannica* appended to the letter we are noticing affords further information on this complicated question. While the value of silver fluctuates so greatly and is so uncertain, no wonder if the great and wealthy countries of the world refuse to use it as, alternatively with gold, a second standard of value.

CEYLON UPCOUNTRY PLANTING REPORT.

THE PLANTER AND HIS COLOMBO AGENT—RISE IN EXCHANGE—PRICE OF TEA LEAF—MR. LIPTON AND HIS TEA TRADE—WHAT WE MAY HEAR NEXT—A CASE OF ALCOHOLIC FAMINE—WHAT THE WRITER FEELS RESPECTING IT—COFFEE CROPS—WEATHER.

July 31st.

The planter has long regarded the Colombo agent as his natural enemy. He could drill into his profits with as little consideration as a hard-headed borer makes its way into a cacao pod ; and when the planter showed any tendency to exuberance of flush, the Colombo agent was able to keep it well in hand, and put the best sucking bug to shame by his powers of absorption. For keenness in looking after number one he was held to be unique : his like not easily to be found in creation. When a story of mean smartness was told upcountry, if it were fathered on the Colombo agent it took at once and became a portion of the orthodox canon which was regularly recited when planters were wont to gather together. Of late, however, the Colombo agent's notoriety has been somewhat on the wane, and—it is with grief I have to record it—his place is being taken by the planter who buys leaf. Before the rise in exchange, leaf was fetching from nine to ten cents a pound ; but when the Americans meddled with our silver and we had to face the dearer rupee, the planter who buys leaf fixed his own price. In doing so, he very often not only covered the difference of exchange but so much for his panic as well ; and it became pretty evident to the seller that whoever was to be cornered, it was not likely to be the man who was buying the leaf. "Talk about the rapacity of Colombo agents," said one to me who was told that 8 cents was all that he was to get in place of the decent 9½ cents—"talk of rapacity : why, when you begin to sell leaf to your neighbour, and prices fall or exchange rises, nothing can beat him for extortion." I suppose that there have been more disagreeables among planters over the purchase of tea leaf than over everything else put together. The

only way which I know to get out of the difficulty is the Central Factory, which is the property of the contributing estates, and which runs and divides its profits, as a separate concern.

The following about Mr. Lipton is from a home correspondent :—"I intended sending you a cutting out of an evening paper about Mr. Lipton's great purchases in Ceylon, but you seem to know all about him already. He is a wonderful man, and I don't think you would know the tea he sells to be *pure* Ceylon tea. It may be pure when it leaves the island, but not when it reaches the tea-pot. Mr. Lipton has quite a regiment parading the Glasgow streets just now advertising his goods. About twenty or thirty men rigged out in white suits, red turbans, red and yellow umbrellas, and a commander on horseback with his face coloured to match his turban. There must be a good profit off the tea after all." The next thing we shall hear of will likely be that an arrangement has been made with Mr. Lipton's men in Ceylon, that when at any time they go home on leave, part of that leave will require to be spent in pushing the tea trade in the ranks of the above-mentioned corps. Only the V. A's should be mounted, and this privilege should be granted on the understanding that while on duty all orders should be given, with the view to impress the public, in a stentorian voice, and in the Tamil tongue; uniforms to be supplied at Mr. Lipton's expense, and like the historical toothbrush to "belong to the ship"!

A friend of mine has a pathetic tale to tell me of a popular resthouse run out of drink. It seems that this poor thirsty soul arrived after a journey of something like twelve miles in a pony-bandy with bad springs. He had been smoking all the way to keep himself cheerful. The boy as usual was nowhere, and a thirsty throat was made drier, in shouting around for him. When he did appear, a whiskey-and-soda was ordered: but there was none. The visitor then said he would have beer, but the reply was "Beer all done, sir." "Then what have you?" "Got nothing, sir! plenty of gentlemen here yesterday, everything drink!" My friend, I suppose, must have looked desperate, when this awful truth was made known, for the boy immediately assured him that they had plenty of *empty* bottles! He has been puzzled ever since to know what there was in his appearance to justify that boy in fancying that a smell alone would do him good. It is rather funny the idea of his expecting sympathy from me when an alcoholic famine is on, as my settled opinion is, that it would do a lot of good if this kind of scarcity were more general.

I was at one time visiting the menagerie of an Indian Rajah, which was a poor, poor affair. The place was badly kept, the animals few and dirty, and the attendants were numerous. As I was leaving in disgust the guide pressed me to wait and to see the tiger. Reaching his haunt, the fellow stopped and pointing to a big empty cage, said, "This is the tiger's cage, but *the tiger is dead*"! I fear my friend looked with as much disdain on the empty bottles as I did on the vacant cage, and to this extent only can I enter into his feelings.

Coffee is ripening up a little, the fruits of the first blossom. The sample of bean however is somewhat small, but if there will just be plenty of it, that need be no cause for complaint. Liberian dried in the cherry sells locally very much better than when pulped. The Moor buyers readily give R5 a bushel, and as it takes about three to make a bushel of parchment selling it as cherry coffee is very much more profitable.

The weather is simply perfect for planting purposes. PEPPERCORN.

GOLD IN AUSTRALIA AND INDIA.

The following extracts from recent letters on the Victorian gold fields by a special correspondent of *Engineer* may be of special interest at the present time :—

That some of the Sandhurst people have learned to mine and crush quartz economically is beyond dispute; in fact, in a few cases, the mine records are astonishing, and point a most useful lesson to miners and millmen all over the world. The *St. Mongo* Mine at Eaglehawk being notably one of this class, some particulars concerning its work for the past half-year supply the lesson. The quartz in this mine is not in a defined lode, the western wall is the only one marked; the eastern wall is entirely broken up; from 600 ft. to 803 ft. the deposit is almost vertical, then it underlies west. The quartz is nearly pure white intersected by bands of slate, and both show pyrites but little or no gold, the width of the deposit varies from 3 ft. to 35 ft.; a general fair average would be about 14 ft., and of this only about 6 ft. is put through the battery, the remainder being barren bands of rock. For 5½ years this mine has worked on quartz, giving a yield of under 5 dwt. of gold to the ton; on this return some £28,000 has been paid in dividends; the machinery has been kept in thorough repair, and the mine properly worked and developed.

Another of the typical mines on Sandhurst is "Landsell's 180;" the depth of the shaft was on July 31st, 2,590 ft. This is the deepest mine in the Southern Hemisphere, and if I mistake not the deepest gold mine in the world.* When the property came into the hands of Mr. George Landsell, the present owner, the shaft was at a depth of 460 feet, and no machinery on the ground; all the winding was done by a horse "whim." During Mr. Landsell's tenure of the property, he has taken out over 160,000 tons of quartz which have yielded 88,346 oz. of gold the value being about £353,384, and he is still working the mine vigorously. The correspondent of *Engineering* concludes his article as follows :—"Where mines have to bear the burden of supporting boards of ornamental directors each drawing £100 or 200 per annum, together with highly paid secretaries, managers, consulting engineers, staffs of clerks, and costly offices, &c., other and richer fields than those of Great Britain or even the majority of the present fields of Australia, must be sought before subscribing shareholders can expect a return in the shape of dividends." These extracts contain both encouragement and warning to our local gold Syndicates. It is evident that if quartz containing only 5 dwt. of gold to the ton can be raised 2,000 ft. and crushed probably in Australia with expensive labour, to contend with quartz at least equally rich should yield a handsome return here, with care and economical supervision. The Mysore mines, which are only 200 or 300 feet deep are said to require 20 dwt. to the ton to cover cost and we believe the special correspondent of *Engineering* has pointed out the cause of this, in the concluding paragraph which we have quoted.—*Indian Agriculturist*, July 19th.

COCHINEAL.

The Belgian Consul-General in the Canary Islands devotes a very considerable portion of his report to cochineal, describing in detail its production, the different commercial classes of the product, and its analysis, also enumerating the various substitutes which are now in use in place of cochineal, as well as a tabular statement of the exports, price per pound, and total value for each year from 1831 to 1888. In 1831 only eight pounds were exported, for a value of 80 francs; the maximum export was reached in 1869, when it amounted to 6,076,869 lb. for 19,749,824 francs, fluctuating then for several years between four and five million pounds, declining in 1886 to 2,330,947 lb., in 1887 to 2 169,341 lb., and in 1888 to 1,735 200 lb.—(*Recueil Consulaire*, vol. lxix., part 4, 1890.)—*Chamber*

* The deepest mine of any kind in the world, we suppose, unless the record is beaten by a salt mine in Germany?—ED. *T. A.*

of Commerce Journal, July 5. [The dye is yielded by a coccus allied to our coffee bug, but which feeds on a species of cactus. The aniline dyes have adversely affected the trade in this substance as well as that in Indian and other madder.—ED. *T. A.*]

CATTLE AND CATTLE MURRAIN IN CEYLON.

Our correspondent "Truth" is very much mistaken if he supposes that we do not appreciate, as much as he does the value of cattle for industrial and food purposes. The difference between us resolves itself into a question of the effectiveness of measures of quarantine in stamping out disease. Such measures and the destruction of affected herds have proved efficacious in countries like Britain, where the humane principles of Christian civilization are applied to the treatment of animals and where cattle are warmly lodged and amply fed. In such countries cattle disease is not indigenous, as it is in the Russian steppes, in most parts of India, and most certainly in Ceylon, although our correspondent writes as if, like cholera, cattle murrain was always introduced from India. We can prevent cholera from assuming an epidemic form in Ceylon by segregation and other measures, more or less heroic, because the dreadful disease is not of local origin and we are able generally, at once, and effectually to deal with the first cases introduced from India. But as regards rinderpest and other forms of cattle disease we are comparatively helpless, because disease, in the germinal form at least, is ever present and ever will be until the natives learn to feed and fold their cattle according to the dictates of humanity and the principles of enlightened science. In recent letters from Nuwara Eliya the writers have contended that the measures of quarantine and restriction as to feeding grounds eventuated in a greater destruction of cattle than was due to the epizootic disease against which the precautions were taken. The difference between Britain and Ceylon is accentuated by the fact that in the one country cattle are bred and "byred" and fed with reference to consumption as beef. Here their chief value by far is with reference to their employment in agricultural operations and, notwithstanding the advance of railways, for draught purposes on roads to a very large extent. Some years ago we had to point out to this very correspondent that the stringent measures he advocated for the repression of an epizootic, if carried actually into effect, would put a stop to the principal traffic and commerce of the island. The difficulties still remain, as the Nuwara Eliya case shows, and we confess that our own hopes of improvement rest on the gradual disappearance of disease, as the natives are taught by Government measures and individual efforts and as they profit by such teaching, to add adequate shelter to plenty of nutritious food in the treatment of their cattle. Our readers are aware that we have frequently advocated the utilization of some of the tanks which have been constructed and reconstructed of recent years, in the irrigation of grass meadows for the provision of cattle food as well as for the growth of rice to feed the owners of cattle. Then much could be done by clearing rice grounds left fallow and also village reserves of all low jungle and weeds so as to encourage the growth of the more nutritious of our native grasses some of which are excellent. In addition to these, why should not the cultivation of the valuable water grass, so common in Colombo be extended to the swampy lands of rural districts? Government, through its Agents, could do much to help on reform by offering prizes for such culture; for the best and cleanest kept village feeding grounds; for the best constructed and most carefully attended cattle sheds, as well as for the best bred and best fed, largest and strongest cattle. At present so-called wooden ploughs which merely scrape the surface soil in the shape of mud are used to the exclusion of real ploughs calculated to stir effectually six inches of earth, however light such ploughs may be, because of the chronic weakness of the badly-fed and ill-tended draught cattle. In a private letter our correspondent denounces Sir Arthur Gordon who did so much for irrigation, because he did nothing calculated to improve the breed of cattle. We suppose our late Governor would adduce the supply of pure water in so many places as a great step in advance for the improvement of the health of cattle; and there can be no doubt that the more rice is grown by irrigation, the greater is the supply of food for cattle in the shape of straw, husks and occasionally grain. But we quite feel that in addition to due attention to irrigation as well as other modes of culture, our new ruler would do wisely and well in taking up with energy the cognate and no less important problem of improving the breed and condition and saving from periodical destruction by disease the cattle on which so much of the agriculture and internal traffic of Ceylon is dependent. We feel sure that it will be the inclination as well as the duty of Sir Arthur Havelock to initiate and further all the direct efforts possible to secure such desirable objects. It is for this reason among others, that we have urged the widening of Irrigation into Agricultural Boards, but if a permanent change of that kind is not contemplated at present there ought to be a special effort made in reference to cattle disease.

Meantime let it be specially noted that not only every tank constructed, but every mile of railway, carriage road, bridle and village path by which the country is opened up and intercourse and commerce facilitated, tends not only to improve the condition of the people of Ceylon, but to render possible such measures as will lead to the improvement in breed and condition and the protection from disease of the cattle, which are not merely a source of wealth in themselves, but on the presence of which in sufficient numbers and in good working condition the prosperity of the country's agriculture and commerce so largely depends. One of the ablest of Sir Arthur Havelock's predecessors, Sir Hercules Robinson, who did so much for systematic irrigation, recognized so fully the importance of this cattle question, so closely allied to the other, that he appointed a Commission to report on the subject. That Report, which embodied matter of considerable interest, might well be reprinted as an extra Sessional Paper now, and made the basis for the conduct of investigation, report and recommendations by a fresh Commission, of which Mr. Wm. Smith ought to be a member as he was of the previous one. With him might well be associated Mr. Green of the Department of Public Instruction, Mr. Drieberg of the Agricultural College, and Messrs. Ramanáthan and Seneviratne as representing the two great sections of the native community. If a Commission of seven should not be deemed too unwieldy, another civilian who has taken special interest in the subject might be added, as well as a well qualified member of the general community. On this occasion the Commission need not be peripatetic. It can collect much and valuable information, suggestive of wide improvement, while sitting at Colombo.

After having written the foregoing we read for the first time the English version of Mr. W. A. de

Silva's pamphlet on the treatment of eattle, with the manuscript remarks of our correspondent "Truth." Considering that Mr. de Silva, writing for natives, was bound to deal with the very elements of the subject, we think his performance creditable and calculated to be of considerable use. We find that he antieipated our suggestions respecting the cultivation of water grass and the clearing of village feeding grounds. Amidst much stringent comment our correspondent approves of a good deal of Mr. de Silva's observations and recommendations on the treatment of cattle in health. But, as we anticipated, when epizootic disease comes, "Truth" would not palter with it by treatment: he would stamp out disease with the life of the animals affected. The extent to which this would have to be done and the enormous amount of the remuneration necessary would be the difficulties.

When cattle murrain breaks out in Ceylon (generally in years of abnormal weather), it does not appear in one or a limited number of loealities, where a few affected herds could be sacrifieed and the disease stamped out. Disease occurs in so many centres simultaneously, and becomes at once so widespread, that the stamping out process would require the extermination of the cattle of whole districts, a process which would be too costly for Government to resort to (if the principle of compensation were recognized), even if popular opinion amongst the native cattle-owners did not take the form of serious and active resentment against measures which they are not yet advanced enough to understand. Our correspondent "Truth," evidently holds the opinion that rinderpest is no more indigenous than cholera; that it always comes to us from India with imported cattle; and that, therefore, it is capable of being cordoned, stamped out and prevented from spreading. A Commission might now do valuable service in collecting evidence and instituting research such as would settle differences of opinion on this question. The Commission of 1869 were unable to say when or whence cattle murrain came to Ceylon, only suggesting that with increased imports of cattle from India in the years following 1840, it may have been "re-introdueed." For the minor diseases, treatment and medicines sueh as Mr. de Silva recommends may be more or less efficacious, although some of the recipes do look empirical. But surely Mr. de Silva has reason on his side when contending that the small, wiry Sinhalese cattle have merits of their own, such as agility and swiftness when used in the native carriages called hackeries, and that with good shelter, pure water, nutritious food and careful and humane treatment generally, they are capable of considerable improvement. These small but symmetrical and lively "zebus" (not zebras, as sometimes printed) have been greatly admired by visitors. One of the chief measures recommended by the Commission of 1869, the provision by Government of bulls of superior breed, failed from the apathetic indifferenee of the natives. This immobility it is which has to be conquered, in regard to all and every proposed improvement, and in an oriental country like this we expect servants of Government not only to hold out indueements such as we have already indicated, but to use a certain amount of benevolent coercion: compelling people who occupy very much the status of children to do what is beneficial to their own interests and the public weal, and to abstain from practices which are injurious to both. The difficulty, as all experienced persons know, is to obtain a native agency which would not pervert powers of compulsion into an instrument of oppression. The Nellore and some other breeds of Indian cattle are beautiful milkers and splendid for draught, and there can be no question of the superiority of British and Australian cattle. But Mr. de Silva is correct in indicating that in proportion to superiority of breed as judged by size, so is the cost of feeding and keeping the animals. At Pallekelle in Dumbara; in the once famous sheds on the Mattakelle patanas in Dimbula; and in other places in Ceylon, we have seen as fine collections of pure imported and half-bred cattle as eye could wish to look upon; but the question for a Commission to ascertain would be,—did such cattle, kept, as they were, at large expenditure of money,—pay, either as manure or milk yielders or as converted into butcher meat? The history of experiments in connection with that unfortunate failure, the Prince Alfred Model Farm, is not in popular estimation encouraging, after all qualifications are made. The difficulty in this country is to get even Europeans to give a good price for a superior article. Demand is, after all, so limited amongst the beef, milk and butter using section of the community that supply can easily be made to outrun it. Such are some of the difficulties to be contended with, in cattle keeping and dairying. In the days when heavy manuring of coffee was in vogue, we heard of a case where the bearing of an estate was brought up from a normal yield of 5 or 6 cwt to 13 cwt per acre! When all the cost of cattle keep, with preparation, carriage and application of manure, was calculated, however, the balance-sheet shewed a considerable loss! When the bad times of the coffee enterprise came, magnificent establishments of cattle were broken up, and the animals, thrown in large numbers on the market, were sold for a song. There can be no doubt of the benefit which tea would derive from liberal applications of cattle manure, but it does not accord with our observation that cattle are often kept on tea estates, save where the existence of adjacent patana and other circumstances are exceptionally favourable. Grain, especially leguminous grains and poonac, with cotton seed, are valuable as cattle food, but price puts a limit to the use of rice, maize, pulses, poonac (especially gingolly poonac), except for animals used for heavy and steadily profitable draught purposes, or by well-to-do persons for dairy produce. Our correspondent will think we are acting the part of "devil's advocate", but it is well that all sides of the question of eattle breeding and cattle keeping should be looked at.

We proceed to notice some of the criticisms of Mr. de Silva's pamphlet by our correspondent, who asserts that native meadow grass is unknown to him. It requires courage for a mere lay editor to differ from an expert, but we venture to assert that if our native grasses got fair play by being kept clear of weeds, and especially if they were irrigated by ordinary water, or better still with liquid manure, they would supply excellent cattle feed. That they could be converted into beautiful coverings for lawns, the writer knows from the fact that in the green turf of the grounds of the Melbourne Exhibition of 1880-81, he recognized one of the grasses most common in Ceylon. We would remind our correspondent, too, that, included in the Report of the Commission of 1869 was a paper on the value of Indigenous Grasses supplied by the late Mr. Thwaites of the Peradeniya Gardens. We are not speaking of the wiry grass common on some of the mountain patanas, which in its natural state is about as "fusionless" stuff as could be found in the shape of grass. But even this, like the still more common mana grass, yields fairly good cattle feed in the shape of the young stalks which spring up after a patana burning. But, as to the merits and demerits of the prairie grasses of Ceylon, so

undonbtedly inferior to the prairie grasses of America and Australia, no one can speak with so much authority, founded on experience, including the application of fertilizing substances, as our correspondent himself. He can tell us whether Thwaites was correct in stating that the wiry patana grass, and other coarse grasses, so poor in nutriment in their growing state and so little relished by cattle, were capable of great improvement when converted into hay and then chopped and pounded? Mr. de Silva advances the proposition that "the cause of local cattle being generally of a poor type is not owing to any imperfection in the variety itself, but because they have degenerated by bad treatment." Our correspondent must surely have written rather rashly when he penned the following criticism: "Not so: they are the product of the soil." Surely the cattle are as much the product of treatment as of the soil? The Report of the Commission of 1869, to which we shall refer in another article, explicitly recognized the degeneracy of the local breed of cattle as due to bad treatment which specially predisposed them to disease. Beyond question the Sinhalese breed of cattle, during ages of starvation, in the two senses of inferior food and insufficient protection from the weather, have degenerated, and are capable of very considerable improvement, with reformed treatment, as draught animals, as flesh suppliers, and even as milk yielders. To come to the opposite conclusion would be the pessimism of despair; for we do not suppose that our correspondent contemplates improving the indigenous cattle off the face of the earth and superseding them by introduced stock? The country is scarcely prepared for measures even less revolutionary. We have always felt that the Sinhalese people were inexplicably indifferent to the value of milk as food, and we have not the slightest doubt that to neglect of this most valuable source of nutriment is due a large portion of the excessive mortality amongst children in Ceylon. But we know that native cattle, when properly fed and treated do become fair milkers, and it requires only a little sum in arithmetic to prove that a Sinhalese cow yielding half-a-dozen bottles of milk per diem and consuming food only in proportion to its bulk and yield may be as good an investment and a far safer one than a big European, an Australian or an Indian animal, the first cost of which is heavy and which is costly to keep. Let us have better breeds introduced by all means, but surely on the improvement of the native cattle, and on measures founded on faith in their capability of improvement, our main hope of successful effort must rest? On some points our correspondent is at one with Mr. de Silva; and while he characterizes cotton seed as one of the best feeding stuffs for cattle, he is still more emphatic in his approval of poonac, the local term for oil cake. Referring evidently to coconut cake, he writes: "Poonac is the only indigenous artificial food we have, and too much cannot be said of its valuable nutritious properties. When fresh and sweet, it is, in my opinion, second to no cake, linseed or cotton seed not excepted." Such being the case, can our correspondent tell us why so large a quantity of gingelly poonac is imported into Ceylon from India and used as food for milk and draught cattle in preference to the coconut cake? The qualification "fresh and sweet" is important as regards coconut poonac, which even in its freshest condition is possessed of an odour that so tells on the milk of cattle fed on it, that such milk is not considered suitable for children. What has our correspondent to say on this point? As a flesh former, no doubt coconut poonac is a valuable cattle food, but is it equally valuable as food for cattle yielding "the lacteal fluid"? On cattle disease our correspondent remarks: "Our two contagious diseases are rinderpest, (murrain) and, second, vesicular epizootic (foot and mouth disease)." The word "our" sounds as if our correspondent agreed with the view that the diseases referred to are practically indigenous to Ceylon, which we shall certainly hold until we have evidence to the contrary. Some years ago we dealt with a mass of reports and recommendations, by the head of the Medical Department, amongst others, which showed that (contrary to the deliverance of the Cattle Commission of 1869,) cattle disease in Ceylon: was as prevalent and destructive in the early period of British rule at the beginning of the century as it is now. Then as now it was traced to poor food, foul water and specially exposure to the influences of the inclement monsoon weather. The real remedies are more obvious now than they were at the period referred to. Our correspondent will say: "Yes: quarantine and stamping out." We also say: "Yes, if the latter were possible. But as we fear it is not, and as the disease is, now at least, as native to the soil as the cattle themselves, we must resort and trust mainly to less heroic measures of gradual improvement in breed and treatment of cattle, and largely in improved pasturage." We are very much surprised to see the adverse criticism on what we consider a very sensible passage in Mr. de Silva's pamphlet, which runs thus:—

"The principal causes which lead to the spread of cattle murrain and the destruction of such a large number of cattle in this island may be attributed to the want of proper shelter from the extremes of weather, their degenerate condition, protracted droughts and the want of a proper knowledge of preventative measures.

"The great hardships and the evils attended on cattle for want of shelter was dwelt upon at length in a previous section. When cattle suffer on account of exposure to night air, &c., and hence become weak, they are liable to get the contagion easily. A weak animal is always liable to disease."

Now it is quite true that when rinderpest breaks out amongst animals, as in the case of cholera amongst human beings, the strong and healthy are liable to attack with the weakly and diseased; but certainly not in the same proportion, and to deny that a degenerate state, arising from bad treatment, as well as unfavourable meteorological conditions, predisposes to disease, is to go counter to experience and commonsense. As a comment on Mr. de Silva's recommendations that diseased animals should be segregated and treated, our correspondent interjects the exclamations, "Kill them at once! and bury them!" That, of course, would be effectual, (if the carcases were not, as they have been, dug up and used as food!) were there only one, or even half-a-dozen centres of contagious disease; but if, as we contend, the germs of the disease and the tendencies to contracting it are widespread and general, stamping out by destruction is impossible. Of course we are writing of rinderpest, the equivalent in the bovine race of cholera in the human being; for even our correspondent concedes that foot-and-mouth disease, which in veterinary nomenclature becomes "vesicular epizootic," may possibly be best treated by segregation.—Let our position as regards the much more serious and fatal disease be clearly understood. We most thoroughly believe that the true remedy is "stamping out,"—were it possible. But if, as we believe, it is not, then we must address ourselves to so altering existing conditions in the treatment and condition of cattle as to render its appearance and ravages gradually rarer and rarer, and ultimately impossible.

COFFEE IN UVA.

(From an Old Planting Visitor.)

Coffee looks wonderfully fresh on the Spring Valley and Uva Companies' estates as well as in Haputale, and in many places, only close inspection reveals the presence of the lurking enemy green bug. It is, however, very apparent that all estimates must be more or less "shaky" as long as this pest displays such vigour as is seen on almost any field of coffee.

MANGOES AND MONKEYS IN AFRICA.

From the proceedings of the A. & H. Society of India we quote as follows:—

Colonel Pollock, writing from *Mombassa*, says:—"The mango here is excellent, almost as good as any graft, and of a very large size. The trees as soon as one crop is all but ripe, begin to flower, and go on flowering at intervals: so, on the same tree may be seen fruit from the size of a large gooses egg to fruit just forming. There is, therefore, on the same tree, fruit which ripen n succession, and the same tree givesmangoes for upiwards of two to nearly three months, and virtually it bears all the year round.

The trees are never bare, but for six weeks, from August to middle of October, there is very little ripe, but plenty of unripe fruit, fit for tarts, pickles, &c. I have planted a lot of kernels which I brought with me from Bombay and Bangalore, and they are getting on well. I have also some 6 of the best grafts from Bombay; time will show whether the plants are affected by the climate, or whether the African mango is different from the Indian. I am going to graft some best kinds of Africans on to the Indian grown from seed, and will let you know, if I remain long enough, the result. Please let me know if the mango kernels I sent you germinated. I can send you hundreds and hundreds, for the place is a mass of mango trees. Some of a delicious variety, as large as an ordinary musk melon, and others, equally as sweet—not much larger then a duck's egg and all but free from fibres; but the Africans pick them too soon, and they sodden in the ripening, but if they did not thus pick them the monkeys would save them the trouble, for they abound in thousands and are most destructive. If they see the ground has been disturbed, they immediately scratch all round, and if they find grain, devour it. I have had a large area planted with Indian corn utterly ruined. The seed they failed to find came up only to be destroyed by these mischievous brutes, by being plucked up in pure devilry. Could you send me some blue gum and other Australian seeds to put down. It is puzzling here, for the seasons are just opposite to what they are in India, and having lived there so long and been used to plant in October and November, I can scarcely restrain myself from doing so here. But December is our hottest month, and though the heat under shade is nothing to speak of, the sun is very hot, the earth becomes almost red hot. Even the Indians or rather Africans, with hoofs like that of a Rhinoceros, can scarcely walk over it, and plants crumble up. Can you tell me what will destroy the large black ant? They are here in millions and kill everything. The climate here is delicious out of the sun. There is a nice breeze all day, and I prefer it to Bangalore. Twenty miles from this, easy to get at, is a plateau 1800 feet high, with a climate like that of Shillong."

FIBRES.

Read a letter from Mr. W. H. P. Driver of Ranchi, referring to an article in "*The Englishman*" on Yucatan hemp, and asking whether the Society could supply the seed, or where he could obtain some. The following is the article referred to:—

"Where is Yucatan? Probably few people could lay their fingers on it on the map at a moment's notice, but it is worth while to look for it. It is asserted by the correspondent of the leading Commercial organ of South American trade, that Yucatan is now so prosperous that money is a drug, people do not know what to do with it, and they are willing to buy all kinds of goods even the most costly."

The *Morning Post* states that this assertion is backed up by official information, since made public, relating to the material progress of Yucatan. We are thus informed that the abnormal prosperity which the country is enjoying is entirely due to the successful culture of the 'henequen,' or, as it is generally termed, the 'Sissal' plant of commerce, which yields one of the finest varieties of hemp extant. The population of the whole Republic of Yucatan does not exceed 3,000,000 souls, but the value of the 'Sissal' crop annually exported exceeds ten million dollars. There is an unlimited demand for the article in Europe, as well as in the United States, where it fetches from fifty to fifty-five pounds sterling a ton. The plant, we are told, is indigenous to the country and grows wild. It is easily propagated, and will thrive in the worst soil. In fact, it does best in rocky and impoverished ground, where nothing else can be grown, and in such situations it yields the best fibre. It cares nothing for drought; cattle have an objection to it, and avoid the spots where it grows. It suffices to dibble in the young plants in any barren and exposed plot of ground. Three years after planting the leaves are large enough to furnish a supply of fibre, and then the plant yields abundantly for 15 or 20 years. The produce of an acre of land is estimated at 1,000 lb. to 1,200 lb. of clean fibre, and the money value of this produce is estimated by a Jamaica planter, who has spent several years in growing Sissal in Yucatan, at eighty dollars or £16 sterling. But if all this information is correct, why should not an attempt be made to cultivate the Sissal in India? Every body cannot emigrate to Yucatan to try his fortune there; so it would be preferable to begin by trying if Sissal cannot be acclimatized in India. The climate is not dissimilar, and there is a fine area in the Sonthal Parganas where an experiment might be made on the rocky, barren, and exposed soil which the Sissal is said to love in Yucatan."

According to Mr. Baker, the three plants yielding the Sissal hemp of commerce are varieties of *Agave rigida*, Mill. Full information respecting this hemp has been published in recent numbers of the Kew *Bulletin*, a note embodying all known on the subject appeared in one of the earliest numbers, No. 3, for March 1887, and additional notes as recently as March and again October of the current year. From the short allusion made to the machine in use for cleaning the fibre, by Mr. D. J. Stoddart of Jamaica, whose pamphlet is quoted in the *Bulletin*, it appears to be similar in form to one of those in use in Mauritius for cleaning the aloe fibre (*Furcræa Gigantea*, Vent) there. This machine would, no doubt, be equally applicable for cleaning aloe fibre in this country, and as the raw material can in some places be had for the cutting, its capabilities could be readily tested and cost of working, &c., exactly ascertained. A model of the machine was obtained some years ago and is still in the possession of the Society.

It may be as well here to quote the Kew *Bulletin* for March last as to the prices for *Sissal*:—"The market value of this class of fibre, and the permanency of demand for it, has been fully investigated at Kew, and in a note on page 3 of the Kew *Bulletin* for April 1887, there is a summary furnished by Messrs. Ide and Christie which gives the average price per ton for Sissal hemp in London for the years 1879-86 inclusive. These are 1879, 27*l*.; 1880, 27*l*.; 1881, 28*l*.; 1882, 28*l*.; 1883, 27*l*.; 1884, 21*l*.; 1885, 19*l*.; 1886, 21*l*. The highest price paid was 32*l* 10*s*. 0*d*. in December 1879 to February 1880, the lowest price was 17*l*. 15*s*. 0*d*. in January and February 1886. Recently there has been an increased demand for white fibres, with a corresponding rice in prices. There was no quotations for Sisal hemp in Messrs. Ide and Christie's London monthly circular for December 15th, 1888. The only remark being 'in retail supply, and selling at fancy prices.' In the United States, Messrs Crockens' statistics, dated the 1st December, gave tho price at 8 to 8⅜ cents, per lb. (equal to about

37*l.* to 39*l.* per ton). A rough Agave fibre from Bombay (probably repared by hand) was valued last December at 15*l.* to 17*l.* per ton. Mauritius hemp prepared by machinery, *Furcræa Gigantea* (known as the green aloe or green Agave), was valued: good 34*l.* to 35*l.* per ton; fair, 33*l*, per ton; common 30*l*, per ton.—*Proceedings of the Agricultural and Horticultural Society of India.*

FUEL PLANTATION IN MYSORE.—The Forest Department of the Mysore State supplies the Mysore State Railway with fuel, and the Inspector-General of Forest Plantations, having in view the increasing demand of the railway and the mills in the province, has made arrangements for maintainig fuel plantations on a large scale.—*Indian Engineer.*

TEA MACHINERY.—The Commercial Co. in Slave Island are adding extensively to their engineering establishment, by means of extending their workshops &c. The work of this particular branch of their business has been steadily increasing owing to the great demand for Mr. John Brown's patent tea machinery which has sprung up of late, so much so, that the Engineer in charge of the workshop, Mr. W. Pottie, is now turning out as many as ten and twelve patent dessicators per month, which occupies three European Engineers travelling about the tea districts from estate to estate supervising the erection of them.—*Cor.*

THE PRICE OF LAND IN CALIFORNIA.—A writer in *Bradstreet's*, in concluding a series of articles on the various fruit industries of California, has given some remarkable figures respecting the price of land in that State. At Riverside, which is one of the centres of the orange trade, the prices are almost fabulous. A choice grove was lately in the market there at £600 an acre, and £400 would be called an under-valuation. At Pomona, where oranges, lemons, peaches, apricots, prunes, and nectarines are grown, the upset price for land suited for growing fruit is £40 an acre. About Tresno, the centre of the raisin production, the prices are the same. But when the profits are considered these prices are, perhaps, none too high. Twenty pound to £50 an acre is the usual average, and the cost in labour is very small. The 3,000 acres under oranges around Riverside last year yielded an average of £50 an acre, including orchards not yet bearing. One grower in San Bernardino county put his case in this way:—"I came to this place in the spring of 1882, purchased 40 acres of land and planted it all in orange trees, and muscat grapes. The third year from planting the orange trees bore about £10 worth of fruit to the acre, the fourth year about £25 per acre and last year the orchard produced £60 per acre. Many people are making from two to three times that amount." Another who grows raisins says:—"My 20 acres of raisin vines yielded me this year 50 tons of raisins, which I sold for £1,000 or £50 an acre. I have five acres of orchard the proceeds of which I also marketed green for £60, but my trees were young, this being the first year of bearing. I do not work my land myself, but hire all my labour. My one Chinaman takes care of the ploughs and cultivates my forty acres, and does all the work with the exception of harvesting and pruning, when I have several Chinamen to help him." But the writer concludes by warning his readers that fruit-growing on an extensive scale for commercial purposes is a pursuit for the wealthy and not for the poor man. No land can be got under £20 an acre; the cost of planting is considerable, and then follows a period of from three to five years of waiting for the first crop. Brains, energy and capital are all needed and the chief of these is capital.—London *Times.*

[There is a large market for the fruit close at hand, while the competition of foreign fruit is now prevented by heavy protective duties.—ED. *T. A.*]

THE USE OF INDIA-RUBBER for erasing pencil marks was first suggested in or just prior to 1752 by an academician named Magellan, a descendant of the great navigator.—*A. F. Press.*

TEAMEN are, we understand, losing heavily at present, and we have been assured that no more picking will take place in the country, owing to the discouraging state of the market.—*Foochow Echo*, in *China Mail*, July 17th.

HOW THEY RAISE BANANAS IN HONDURAS.—It seems that they plant them there 18 by 18 feet, which is a very wide distance apart, and a great waste of land. Here the Chinese rarely plant them more than from six to eight feet apart each way, and produce from each hill two large bunches annually for three or four years. A good specimen of a small Chinese banana patch may now be seen opposite Mr. Paul Neumann's residence on King street. They are planted six feet apart, with not a missing hill in the entire patch. They allow but two stalks to the hill, and when the fruit is nearly ripe suckers are permitted to grow, so that they are enabled to get two large bunches from each hill every ten or twelve months. At the end of the fourth year, having taken off three good crops of from 500 to 600 bunches to the acre, they plow up the land and replant with new roots, generally manuring the ground well before plowing.—*Honolulu Planters' Monthly.*

AGRICULTURAL COMPANY OF MAURITIUS.—The annual meeting of the shareholders in this company was held at the offices in Change Alley on June 30th. Mr. J. Longride presided, and in moving the adoption of the report said the company had been very prosperous during the past year, despite the state of the sugar market and the exchanges. There was scarcely anything in the accounts which required notice. Their debenture capital had increased during the twelve months by about 9,000*l.* The stock of sugar in hand this year only amounted to 16,000*l.*, against about 50,000*l.* in the last account. Of course that was an asset which they could not absolutely estimate, but that which they did form on last year's stock was more than realised. There was a net profit of 7,599*l.* for the 12 months, the largest ever made. They proposed now to pay a final dividend of 1s per share, making 10 per cent for the year. They would put 2,000*l.* to the general reserve, bringing it up to 40,000*l.*; 2,000*l.* to the exchange reserve, making the total of that fund 50,000*l.*; and carrying forward 1,993*l.* Lieut.-Col. F. Thurburn seconded the adoption of the report, which was agreed to unanimously.—*O. Mail.*

COOLIES IN COORG.—In Coorg the Coffee planters have as much difficulty in obtaining coolie labour as the tea planters have in Assam, and last year's criminal administration threw some curious light on the caution that has to be exercised in dealing with perverse coolies. Second class Magistrates in the Coorg district were some time ago impowered to try cases of breach of contract, and the immediate result of the increased facilities thus afforded was a marked increase in the number of prosecutions of coolies who had obtained advances on contract deeds and then failed to comply with the terms of their agreement. It might be supposed, says the *Englishman*, that the justice of these proceedings would commend themselves to the coolies, who do not, as a rule, deliberately contemplate breaking their agreements at the time of signature, but rather yield to temptation afterwards, when things do not look so promising as they had hoped. The Coorg coolies, however, do not take this view of the case. They regard the prosecutions as a serious risk attending emigration to the coffee estates, and the effects of efforts of the Government to assist the planters has been a serious increase in the difficulties of obtaining coolie labour. It seems hard to the planters that they should be unable to recover advances for which no work has been done, yet the fact remains that the prosecutions necessary for bringing to justice those who offend are likely to defeat the very objects which the prosecutors have in view.—*Madras Times*, July 15th.

Correspondence.

To the Editor.

PEPPER CULTIVATION AND JAK TREES IN THE KANDY DISTRICTS.

July 9th.

DEAR SIR,—Your correspondent "Peppercorn," in his letter of 4th inst, remarks that "a good healthy pepper vine is found to be more than a match for a sturdy jak tree, and seems to be capable of sucking the life out of it." Where has he lately found the sturdy jak? I am afraid that most planters in the Kandy districts will concur in my opinion that since 1885 a healthy jak tree has been hard to find: every one of them has been in a more or less debilitated condition, with jaundiced foliage and dead and dying branches, and some trees, even without pepper being grown up them, have died outright.

A V. A. with some knowledge of botany might have been expected by this time to have noticed their condition, and to have suggested offhand a remedy; but the common planter is at present in doubt whether the decadence of jak trees is due to the ravages of cockchafer grubs, to borers, to abnormal weather, to root canker, or to the new mysterious complaint called 'mal-nutrition.' We appeal to the press.*—Yours faithfully,

SIC PASSIM.

"£20,000 ANNUAL LOSS TO CEYLON PLANTERS THROUGH CARELESSNESS IN TEA FACTORIES."

London, July 18th.

DEAR SIR,—Take a crop of 40,000,000 lb. tea equal to 400,000 chests. Two-thirds of this equals say 260,000 chests. The dock charge for taring is 1s 6d, and bulking and taring 1s 8d per chest, and it is computed that quite two-thirds of the Ceylon crop has to undergo one or both operations in the London warehouses, and putting this proportion at 260,000 chests the above enormous sum (twenty thousand pounds) approximates the charge incurred.

Why is it Superintendents and Factory Assistants are so careless in these matters of good bulking and even taring of their chests? It can be no great hardship to see that the chests of a break do not vary more than 2 or 3 lb. in their tares, and nailing on pieces of wood or shaving the chests here and there as may be required to obtain even weights. Factory bulking is useless if tares are uneven, for frequently when a break has passed the bulking ordeal the Customs order is, to be turned out and separately tared, the charge for which, as shown, is only 3d per chest less than the charge for bulking.

As to factory bulking, it is often most carelessly done, and a break of say 50 chests pekoe often exhibits three distinct teas; yet all are marked "Factory Bulked" and shipped home as one tea. These irregularities, which add so much to London dock charges, are easily preventible, and carelessness is practically their only origin.

MERCHANT AND PROPRIETOR.

GREEN TEAS FROM CEYLON.

Kintyre, Maskeliya, July 19th.

DEAR SIR,—The extract to which you give prominence in your paper of 17th from Messrs. Geo. White & Co.'s circular might lead your readers to suppose that it was all u. p. with Green Teas as a class. As a matter of fact the three lowest grades *were sold*, viz., pekoe souchong, fannings and *dust* at an average of 10¼d; the average of *all* black teas being 10s $\frac{7}{16}$d. For the 65 per cent of fine teas unsold the bids ranged from 1s 7¾d to 1s 1¾d against valuations from 1s 9d to 1s 2d. I think the bids should have been accepted, but even with a still farther fall of 2d or even 3d per pound, the break would still be above the average of black teas of that week. It will be interesting to know the prices fecthed for the two finest grades of green tea sold by me locally on 16th June for which 81c and 70c were paid, exchange at about 1s 6d at that date.—Yours faithfully, dear sir, H. D. DEANE.

* Or rather to Dr. Trimen, if there are any such suffering "jak trees" in his neighbourhood.—ED. *T. A.*

GAMBIER.

July 19th.

DEAR SIR,—I was glad to read the interesting particulars you gave about gambier, but still the native name has not transpired. I am anxious to get this to make my own experiments. Now that Dr. Trimen has got plants of the Singapore gambier, he is in a position to define the *botanical* difference between the indigenous and exotic.

Christy in his book No. 5 on Tanning Materials says that in Malacca the better kind (cube gambier) is prepared more carefully, and to insure consistency (?) starch or some kind of farina is mixed with it to consolidate it and dry it more easily.

If starch were mixed with a dark extract it would tend to lighten the color, and if such admixture is permitted by the trade I can quite understand that producers would only too readily resort to it, gambier being about three times the value of starch.

Christy also says that as imported into England in its rough state it is very much adulterated, sticks, stones, and large quantities of elephant's dung being mixed with it in the manufacture. PLANTER.

CACAO CULTIVATION: PRACTICAL EXPERIENCE.

DEAR SIR,—I have often heard and seen such erroneous ideas expressed about the profits of cocoa or rather cacao cultivation in this island that I wish to give my experience, with some statistics taken from your valuable Directory, for the benefit of those who may think of embarking in this pursuit, believing it to be very profitable and, as I have somewhere read, a "grandchildren's patrimony."

I came here in 1878 with a certain amount of capital, and after careful investigation concluded that I could not do better than invest in the cultivation of cacao. The conditions of the land on which I commenced operations were exactly those said to be required by the manuals on the subject: Messrs. Jardine and Barber's wealth of information was not then available. The soil was generally a good chocolate loam, three to five feet deep, and the land well-watered, one of the streams having rich alluvial banks: elevation from 400 to 900 feet; the average annual rainfall 90 inches fairly distributed; and the land well-sheltered from wind by ranges of hills and by no means steep. Part of the land had many years previously been for a short time under coffee, part was jungle or heavy forest. The land was opened in 1879 in the ordinary way, many of the jungle trees being left for shade wherever required.

My expectations were for a long time fulfilled: *everything* grew with truly tropical luxuriance, even the Arabian and Liberian coffee of which I had planted a small quantity. As for cardamoms, their growth was marvellous: planted in the open without any shade whatever, and without any holes being cut, the plants, nine feet apart, at the age of two

years were touching one another and gave a maiden crop of 160 lb. per acre. My flower garden and vegetable garden were highly successful; nothing was blighted, nothing failed to grow. And the cacao grew equally well on level ground and in hollows, on slopes and on ridges, better without shade than with it, if only sufficiently protected from wind. I have seen it growing well in those days up to 2,000 feet elevation in poor quartzy soil.

As I had a large reserve, I selected land every year to extend the cultivated area. My clearings were equally successful in the north-east and the south-west monsoons; many parts never had to be supplied at all, the failures being *nil*.*

On May 1st, 1884, on visiting an estate near Polgahawela, I saw for the first time the signs of what I thought to be a serious blight or disease; large-sized trees looking as if they were scorched by fire, the ends of the branches dead or dying. The superintendent told me that, to make sure whether it was due to helopeltis, or not, he had covered one of the few remaining healthy trees after careful fumigation with fine gauze, but that the tree, after some days, had shown the same signs of disease while nowhere on it could any signs of helopeltis be discovered. There were two nurseries in close proximity, one of the ordinary Ceylon kind, the other of the hardy variety called Forastero; the first was in a miserable state of disease, the other perfectly healthy. Not many months had elapsed before this disease had spread in several districts, and a meeting was held in Kandy, with the ordinary result that everyone who had an opinion went away with it, without converting or being converted by his neighbour. But the catching of helopeltis and the planting of shade were generally thought to be the panacea. Forastero and hybrid varieties were not then attacked, and many planters used only those kinds for supplying or for planting new fields.

But to come back to my personal experience. It was only in 1885 that I noticed the first signs of disease in my fields, and by the end of that year I had made up my mind that I should soon see the end of my enterprise, such was the virulence of the attack, and I was not very far wrong.

I have made experiments with manures: digging, forking, holing, trenching; with quicklime and gaslime, with sulphates of copper and iron, arsenic, corrosive sublimate, with kerosine &c., without success. The only palliative is shade, and the best is the dadap, which was introduced some years ago from Assam by a Dimbula planter and by him first planted as shade for cacao.† I say that shade is only a palliative with good reason, because it only mitigates the disease. Near Polgahawela the cacao under shade was severely attacked as well as that in the open, but when the shade trees were cut down three or four years ago and tea planted the cacao recovered and has since given good crops.

Since the year 1885, all my attempts at planting *any products*, in the best of soils, with good weather and with greater care than formerly have been comparative failures. The weeds themselves as well as the jungle trees and the undergrowth of the forest show unmistakable signs of sterility. The Forastero cacao, which for a time had resisted the disease, followed suit, and trees of the ordinary Ceylon kind, which were known to have given good crops regularly for twelve years, were attacked and very soon became barren skeletons.

In your "Ceylon Directory" of 1883-84, p. 40, you state:—"As regards the area planted in 1877-78, it was 500 acres: in March 1881 this had increased to 5,460 acres, and this area in three years has increased by 4,500 acres, and from the 10,000 acres now growing (at end of 1883) of this valuable product we may look for an export of 50,000 cwt, before Sir Arthur Gordon's term of office expires. Of cacao planted alone the area is 4,711 acres; of coffee and cacao planted together we have 10,709 acres" (or a total of 15,420 acres).

If we admit that cacao gave generally its first crop of 1 cwt. at four years of age, of 3 cwt. at five years, of 4 cwt. at six years, and after that age 5 cwt. per acre, we find the following table:—

CACAO PLANTED.

		Acres				Cwt.
1876	...	122	gave in	1879-80		122
1877	...	113	„	1880-81	plus the above	479
1878	...	191	„	1881-82	„	1,018
1879	...	1,953	„	1882-83	„	3,588
1880	...	2,065	„	1883-84	„	9,863

Thus the 5,460 acres said to have been in cultivation in March 1881 ought under the same circumstances to have given in 1884-85 a crop of 17,153 cwt., but the exports fell to 6,758 cwt.! With a large yearly increase of land coming into bearing, the highest export (1886-87) was only 16,638 cwt., and the acreage has fallen, by your latest computation, from 15,420 at the end of 1883 to 11,772 acres, although new land has been opened yearly (1,500 acres would be a moderate estimate). This would have brought up the acreage planted with cacao to 16,920 acres, so that 5,548 acres must have been abandoned almost before they had come into bearing.

If now we assume that of the 11,772 acres only 10,000 are in bearing this season, now nearly ended, we shall find from the exports that the average crop this year is only a little over 1½ cwt, per acre, which shows conclusively that cacao cultivation is not an ELDORADO.

[This tale of disappointed hope is only one of many in regard not only to cacao but to Liberian coffee and cinchona. In certain select or fortunate localities, however, cacao seems still to flourish.—ED. *T. A.*]

* A neighbouring plantation gave in 1883-84 a crop of 4 cwt. per acre over 200 acres planted in 1878-79. The trees, planted 9′ × 9′, were interlacing so much that it was thought necessary to sacrifice the alternate ones, and shade trees were in some places thinned, with good reason as the cacao in the open was growing much better.

† Mr. Robert Fraser's introduction of the best erythrinas from Trinidad must surely have been anterior to the import of the Assam "dadap"—the Java name for erythrina being "dadap."—ED. *T. A.*

DAVIDSON' SIROCCOS: PRACTICAL HINTS.

Colombo, July 21st.

DEAR SIR,—With reference to "Darjeelingite"'s query taken from the *Indian Planters' Gazette* of the 1st July, *re* difficulty in working a large-sized Down-draft Sirocco, I have much pleasure in giving him the required information. In the first place he says, "I find that the temperature drops from 385 deg. to 210 deg. before it hits the tea on the lowest tray. I also find that it takes 5 maunds of dry wood to each maund of tea, that it does not turn out anything like 2 maunds per hour.

"*P.S.*—I do not find that it puts price on tea, it only enables you to dry with other material than charcoal."

The temperature at which "Darjeelingite" is working is very much too high. Pure hot air cannot be passed through tea roll at the same high temperature as the charcoal furnishes from a chula.

A pure hot air tea drier worked at 385 deg. F. will in the first place consume a large amount of fuel, and in the second will not produce a high quality of tea. But with the Down-draft Sirocco it is *utterly impossible* to raise the temperature over the

top tray in the drying-box, to anything like this degree of heat, *if the fan is working.* "Darjeelingite" must be working his drier with his fan stopped or more likely with the valve behind it shut, which of course would have the same effect.

With a temperature on the thermometer of 385 deg. and say 8 or 9 lb. roll charges on each tray the exhaust air would indicate about the 210 deg., which is the same temperature as that which strikes the bottom tray.

This reduction in temperature of the air after passing through a number of trays of wet roll is essential in any drying machine whatever, as unless the hot air gives some of its heat up in passing it could not absorb any moisture from the roll whatever.

If "Darjeelingite" holds a thermometer over the exhaust of *any* tea drier, he will find that the temperature has been considerably reduced from that indicated on the drier thermometer; or even if he places a thermometer over and under the trays of his charcoal chulas he will obtain similar results. In order to work Davidson's Large Down-draft properly, the following points should be attended to:—

First.—See that the fan is running at 800 to 900 revolutions per minute at least 1,000 rev. gives very good results and the difference required in power to drive at the increased speed is imperceptible.

Second.—The fuel used shonld be split up small and cut into 1′—6″ to 2′ lengths. Large round logs make *very* expensive fuel, as they do not burn well, therefore generate heat slowly. The drier the fuel is, the better.

Third.—The stoking should be properly attended to. A cooly has a natural inclination to cram the furnace full of fuel so that he may have no further trouble with it for half an hour or so. The stoker should stoke lightly and constantly, putting small pieces of wood in at a time and keeping *a good light, even blazing fire*, instead of a black, on the top, and a glowing red fire in the heart of his furnace.

Fourth.—Immediately after the fire is lighted, the fan should be started and the lever handle working the tray-lift and the fan valve should be lighted, thus partially *closing* the valve and therefore *deducting* from the suction power of the fan and enabling the temperature to rise quickly. This handle should be lifted to within an inch or so from the top of the slot in which it works.

Fifth.—The charge per tray must not be too heavy —6, 7, or 8 lb. according to the amount of moisture contained in the roll would be about right. The wetter it is, the lighter it should be spread on the trays.

If the trays are drying too quickly for the coolies to keep up with the work, on no account decrease the fan speed.

To reduce the rate of drying a tray, increase the charge of roll per tray.

The trays should be spread as evenly as possible. Coolies have a tendency to spread thickly in the centre; in that case the sides would dry first as is the case in any drier. If this is attended to, I find the trays are dried perfectly evenly all over. After work is finished, the fan should be allowed to work on for 15 or 20 minutes in order to carry away the heat which the stove would still be producing. When the fan is shut off, the door over the stove should be opened. If these points are attended to, "Darjeelingite" will have no further trouble in the working of his machine, but will be bound to confess, as numbers have done and are doing every day, that the Down-draft Sirocco is a complete success, especially the new large size, not only in quantity of outturn, but also in the quality of same.

The outturn of these machines vary from 140 lb. to 200 lb. per hour tea made, with a fuel consumption of about ½ lb. per lb. tea.

The quantity of out-turn depending on the fan speed, the moisture of the roll and the moisture in the fuel.

Hoping that these remarks may be of use to "Darjeelingite" and to any others who may have takenan interest in his letter.—I remain, yours truly,

F. G. MACGUIRE,

c/o Messrs. Mackwood & Co., Colombo.

PLANTING IN TRAVANCORE: PROSPECTS FOR SUPERINTENDENTS.

July 21st.

Sir,—Having had a few inquiries and heard of others having been made by Ceylon men as to the advisability of seeking or accepting employment in the planting districts of Travancore, I would be glad if you would kindly give publicity to the following. To such enquiries I would most emphatically say "Don't," and for these reasons:—

Individual salaries are small.

Superintendents' prospects, with few exceptions, are *not* encouraging.

Vacancies are, as a rule, filled by persons having interest.

There can be no doubt tha. Travancore, as a tea-producing country, has fair prospects indeed before her; but for a man of fair abilities and prospects to leave Ceylon and come to Travancore without having his position, salary and future more or less *guaranteed* would be madness indeed; while again some districts are so unhealthy that a superintendent may never hope to develop the resources of his charge and so gain credit to himself, that with a fair amount of guarantee he would be badly off; and in the event of his wishing to reinstate himself in his old position in Ceylon might find some difficulty after a sojourn of a year or two on this side, to say nothing of time lost.—Yours faithfully, TRAVANCORIENSIS.

PEPPER AND JAK CULTIVATION.

July 23rd.

Dear Sir,—I am glad to find from "Peppercorn's" letter of 18th instant, that the sickness amongst jak trees is more local than general. But I think most planters will admit that there has been, if not serious illness, at least a want of tone in their systems for some years, and this has been shown as much by their poor foliage as by the irregular yield of fruit. I do not refer to tree growing in gardens or specially favoured places, but to those planted on estates. But the debility is not confined to the jak trees. Leaving out of consideration the coconut disease, which Dr. Trimen has disposed of, there has been a marked decline in the vigour of areca trees, pepper, vanilla, annatto, cardamoms, cotton and even of the worthless Ceará rubber. None of these planted during the last four years have grown as freely as they used to; and as regards the last, whereas its seedlings used to germinate in hundreds under the trees, for some years past the self-sown seedlings have not been seen,

Is it not possible that a severe attack of cockchafer grubs has been followed by a root fungus which has impaired the vitality of all vegetation? The effects, of course, would vary according to soil and other surroundings, and would be modified as "Peppercorn" suggests by high cultivation.—Yours faithfully, SIC PASSIM.

WHAT "BI-METALLISM" AND EXCHANGE AT PAR MEANS IN RESPECT OF CEYLON PRODUCE—(1) COFFEE.

Colombo, July 23rd.

SIR,—Herewith is mem: showing the result of our coffee crop of last year at the then rate of exchange and what the result would be at the bi-metallic rate of exchange 2s.

We in Ceylon can in no wise affect the question of bi-metallism, but the statement shows the effect it would have for planters.

The change of currency has powerful influences in its favour at home,—Manchester and the farmers,—and so may probably come to pass.

In "Hazell for 1887" there is a very good article on bi-metallism explaining the matter in short space and showing how the present bi-metallic countries—the United States and the Latin Union—get over the difficulty.—Yours truly, NEMO.

STATEMENT showing the result in sterling of a coffee crop (year 1889) at the then average rate of exchange and the result as it would be at the bi-metallic rate of exchange 2s.

The coffee sold averaged ..	R66·85	p. cwt. f.o.b.
R66·85 at exchange (the average rate) 1s 4⅝d	92s 7½d	
92s 7½d at 2s bi-metallic rate ..	R46·31	
The cost of the crop f.o.b. was ..	R31·97	p. cwt.
The value of crop as above ..	R66·85	p. cwt.
Less cost	31·97	,, ,,
Leaving available for remittance	R34·88	,, ,,
R34·88 at exchange 1s 4⅝d	£2 8s 3d	,, ,,
Value of crop as above 92s 7½d at bi-metallic rate of exchange 2s	R46·31½	p. cwt.
Less cost	31·97	,, ,,
Leaving available for remittance	R14·34½	p. cwt.
R14·34½ at 2s exchange ..	£1 8s 8d	,, ,,

Summary.

If the crop sold at the same rupee price, R66·85 per cwt., when the exchange was 1s 4⅝d, there would be £2 8s 3d per cwt. to remit to England; when the exchange goes to 2s there will only be £1 8s 8d per cwt. to remit to England.—N.

[This is very interesting; but we should expect to see sterling prices "harden" and advance if xchange went still further against us.—ED. *T. A.*]

BUSHEL MEASURES AND ORDINANCE NO. 2 OF 1836.

DEAR SIR,—I am sorry you have made no comment on case No. 3,326 P. C., Panwila, as reported in *Observer* of 26th July last.

In discharging the accused the Magistrate said; "The evidence of the complainant only goes to show that the accused was in the possession of the bushel measures described in the plaint; and I hold that mere possession without proof that these measures were used by accused is insufficient to maintain a charge against him."

What, however, says Ordinance No. 2 of 1836 clause 5? "Any person or persons selling by retail who shall use or attempt to use, *or in whose shop, house, stall standing place, or premises shall be found any weight or measure of length or capacity not being in conformity with the standards hereby established,* shall, upon conviction, forfeit and pay for every such offence," &c.

Coolies are so frequently cheated by dealers in the issue of rice, that as desirable punishment should be sure as inspection should be effective.

A. G. K. B.

["Jove" sometimes nods! The acting Magistrate referred to is, of course, hopelessly wrong. Section 257 and 258 of the Ceylon Penal Code amended by section 1 of Ordinance 11 of 1887 makes it a criminal offence for anyone to fraudulently use or fraudulently to possess a false measure, &c. The mere possession of a false weight or measure however by a boutique-keeper, or shopkeeper is of itself a criminal offence, and no proof of any use or intention to use is necessary.—ED. *T. A.*]

THE INTERMINABLE SILVER QUESTION.

July 26th.

SIR,—Who will be able to agree when doctors differ? Will you try your hand?—or if you have not the data (although I have no doubt it is, being so important a question, already in your new Handbook) perhaps some of your readers may be able to throw light on this inquiry as to the *silver production of the world.*

In the *Observer* of the 19th instant appeared a long statement from the *Economist*, London, 28th June last, in which figures are given as follows:—

	United States.	All other Countries.	Total.
	Fine ounces	Fine ounces	Fine ounces
"1889	50,000,000	76,000,000	126,000,000."

Now at 48d per ounce this would give in sterling

£10,000,000	£15 200,000	£26,200,000.

The *Economist's* figures for 1878 were as follows, *in ounces*:—

34,960,000	38,516,000	73,476,000,

showing that in twelve years the increase under the above headings was say roughly

50 per cent	100 per cent	70 per cent,

—a vast increase without doubt, when it is considered that it has been accomplished at a low rate per ounce during the period mentioned. But our eyes are opened further by the Chairman of the New Oriental Bank Corporation, for in the *Ceylon Observer* of the 21st inst. appears *his* statement as follows:—"The amount of silver coined last year throughout the world is given as 26½ *millions* sterling" (*i. e. all* the silver produced in that year, according to so reliable a source as the London *Economist*, was positively *coined*!) Then he proceeds to tell us, on his own authority apparently this time, that "the whole produce of silver throughout the world was only 32½ *millions* sterling." I suppose he used the word "only" advisedly.

It thus left, says the N. O. B. C. Chairman, only over six millions for making spoons, &c., and therefore it does not seem that there is any enormous overplus of silver!

Well, then, I turn for consolation to the *Tropical Agriculturist* for July last, and this is what I find, on page 45, written by one John Richards, whoever he may be, to the *Adelaide Observer* of May 10th:—"It is quite on the cards, judging from past progress that in less than twenty years, the output of silver (from Australia) will exceed in value any one of our long established staple products"—something very vast no doubt, but extremely visionary, yet it is consoling as far as it goes, for it indicates a cheap rupee—but I am afraid Mr. Richards' figures are more or less the result of a dream, for he says further on that the silver produced in the United States is equal to "about half the production of the world"! My confidence in his statements is further weakened by his saying (upon what authority I know not) that "426 millions of dollars" (*i. e* 426,000,000 ounces of silver) issued by the United States *in paper* have got "no back," *i. e.* they are not represented either "by gold, silver or bullion." A rotten state of things to be sure, and if true the United States Government's demand for silver is not likely to go on unchecked for a long time to come: as Mr. Richards admits, "the cause of the introduction of the Silver Bill is the growing scarcity of gold which means dear money."

Mr. Richards then comes to figures (which I do not like) with regard to the production of silver in Australia. He says: "This year I estimate that about three and a half million sterling worth of silver and lead will be exported":—what a "blend" to be sure! *

Proceeding, Mr. Richards goes on to say: "Australia being the only silver-producing country of any importance in the British Empire and, barring the United States and Mexico, producing more silver than any other country in the world" &c.

I will not make any more extracts from Mr. Richards' figures, who states that (through him) "Australia has a perfect right to make her voice heard in the great bi-metallic controversy that is now agitating England," but I will accept his figures for "silver and lead" as referring to *silver only*—viz. 3½ millions sterling for 1889; all I want to know is where the balance of the silver now being produced in the world, estimated by the Chairman of the New O. B. C. at 32½ millions sterling, is to come from?

At £900,000 sterling per month the United States is now bound to coin *annually* actually more silver than she is said to produce, viz. £10,800,000 sterling! It is clear that other countries have got to produce (out of 32½ millions)22 millions, and yet Mr. Richard declares that "barring the United States and Mexico," Australia comes the next in the list as a silver-producing country. I give him full credit for lead as well as silver, and yet the value amounts to only 3½ millions sterling. Having 18 millions still to trace I would fain know what Mexico, Spain and other countries can offer to fill up this tremendous gap. With, it is said (in a recent telegram), China about to enter the silver market to the tune of 30 million taels (=45 million dollars) the rupee is evidently destined, ere very long, to give Ceylon tea planter a twinge—any way they should be prepared for it.—Yours, N. D.

[Gold is used by 264,000,000 people as their monetary standard; silver by 749,000,000. In some ancient States—ancient Arabia and ancient Germany for instance,—the value of silver was superior to that of gold: and so late as the 17th century silver and gold were valued equally in Japan. From the *Encyclopædia Britannica* we quote as follows:—

Production.—In the principal producing countries—the United States, Mexico, Chili, and Peru—mining is free, and there are no official returns of the production, which is therefore mere matter of conjecture. In the United States it is the custom to value silver bullion a one-sixteenth that of gold. This unduly swells the value of the conjectural product of that country more than one-fourth (see *Report* of the United States Monetary Commission of 1876, Appendix, pp. 1-66). From a careful consideration of the bullion movement the total annual product of silver throughout the world at the present time is estimated at between 50 and 60 million ounces, at which figure it has remained steady upwards of ten years.

Consumption in the Arts.—Direct inquiries as to the quantity of silver used in the arts have met with little success, and the statistics so obtained are defective. But the total production of silver in the Western World from the discovery of America to the present time, has been, in value, about 1,400 million pounds sterling of which about 300 million pounds remain in coins. Consequently 1,100 millions, or nearly four-fifths, have been consumed in the arts, lost, &c., or exported to Asia. There are estimated to be about 50 or 60 million pounds sterling worth of silver coins in India, and some trifling amounts each in China, Japan, Persia, &c. On the whole it appears quite safe to estimate the average annual consumption of silver in the arts and through wear, tear, and loss as fully equal to three-fourths of the production. Lowe in 1822 estimated it at two-thirds. Silver is principally used for plate and jewellery; it is also consumed in photography, and in numerous chemical preparations, such as lunar caustic, indelible ink, hair dyes, fulminating powder &c.

This was written in 1886-7, we may say.—Ed. *T.A.*]

* The explanation is that the ore as it is mined is, in large proportion, sent to Europe to have the silver separated from the lead, that course being found more economical than refining locally.—Ed. *T. A.*

CACAO CULTIVATION.

July 31st.

Dear Sir,—Your correspondent "Eldorado" opens up a very wide question. For several years past there have been very serious discrepancies between the crops seen on the trees and the crops said to have been gathered. At various times I have heard certain Dumbara estates credited with such splendid returns that the Customs export returns looked quite silly in comparison. I hope some of the planters whose estates have lately yielded 3, 4 or 5 cwt. per acre will come forward and explain why their crops have not been despatched to the London or to Continental markets: the local demand, we all know, is trifling.

"Eldorado" dates the disease in his cacao from 1885, but he omits to mention in what year he commenced to plant shade. There is no doubt that the most experienced men, when they began to take an interest in cacao, made very serious mistakes: some adopting plantains as the only possible (and profitable) shade, while some thought the cacao trees, if planted close enough, would shade one another!—and others fancied jak trees were the great desideratum. The apostle of the Trinidad system, to whom you refer as having introduced the "best erythrinas," in his pamphlet, published in 1879, says:—"In Trinidad, of course, the Bois Immortelle is their favorite shade tree, on account of its rapid growth; but I cannot say that the ideas of the school in which I have been brought up quite reconcile me to its use, as it seems to me that it is a surface feeder, for if its large surface roots be cut, a great quantity of water will ooze out of the ground." The writer was quite right in condemning this tree as shade for cacao; and the *Pithecolobium Saman*, even if planted very wide apart, is no better. But the dadap referred to by your correspondent is undoubtedly good: it grows faster than either. Hundreds of acres of cacao that a few years ago were nearly dead have been saved by it; its lower branches, as they drop off, can be used as fuel, and the stems furnish good charcoal. As shade for cardamoms, too, this tree has no equal: I believe it will be found of great use in cinchona clearings also.*

"Eldorado" gives facts and figures which seem very strongly to support another recent correspondent as to the general sterility of all vegetation of late years. If the falling-off, not only in crops but in growth even, has been common everywhere and to all lowcountry products alike, then it must be conceded that there is something *radically* wrong.
—Yours faithfully, UT PROSIM.

PATENT TEA LEAD-AND-PAPER FOR PACKING: MR. T. C. ANDERSON'S EXPERIENCES

Colombo, August 1st.

Dear Sir,—In view of your remarks in your footnote to your correspondent "C. S."'s letter

* But the dadap is simply an *erythrina*, used in Java as a shade tree. Those we saw in Java we described correctly as shabby-looking, and perhaps their non-luxuriant habit is in their favour. The Trinidad *erythrinas*, on the other hand, which, a few years ago, we saw growing amidst the cacao at Warriapolla, were masses of rich vegetation. It would be interesting to learn what Mr. Robert Fraser's opinion of the *madre de cacao* now is, after full trial. —Ed. *T. A*

appearing in last night's issue of your paper, for your information and that of planters generally, I beg to send you a description of the paper lead lining referred to, together with a number of certificates in its favor, which you can publish or not, as you think proper. I have used the lead now for nearly a year in the packing of Gartmore and other estates teas, and the reports on the condition of the tea on arrival in London have all been most favourable. Hitherto the lead has been prepared on the estates by the factory coolies, so that necessarily it has cost more than the ordinary lead, 4 oz. lead being used, but I anticipate that the manufacturers in England, when they learn that there is a demand for it, will produce it cheaper, *i.e.* by utilizing *thinner* lead they will produce a thicker and stronger lining with the aid of the paper. The paper can be purchased in Colombo by those who wish to try it in the meantime, and the cost will be found to be about 12 to 15 cents per chest in addition to the cost of the lead.—Yours faithfully,

T. C. A.

[We give the description, and select one or two from a number of certificates:—

"CLARK'S PATENT TEA LEAD."

This is a new lining suitable for tea chests, boxes and packets, patented about a year ago in Ceylon and the United Kingdom and applied for in other countries. It consists of the ordinary tea lead used in packing tea, lined with *paper* which may be of any degree of thickness, *paper and cloth, calico* &c., combined, or any of these materials with that paper. The objects are to better preserve the tea; to prevent the contact of the tea with lead which is injurious; and to provide a stronger and more easily workable lining, which cannot be damaged so easily when opening and repacking tea chests. The paper being *inside* the lead lining allows of the lining being soldered and hermetically sealed in the usual way.

Gow, Wilson & Stanton, April 3rd.—"All the Teas we have seen so far packed in the new patent lead have arrived here in *capital condition*, fresh, crisp, being free from any flatness or damage whatever. In other respects we like the lead: it is neat and light, and from the accompanying letters it would seem likely to become popular with the trade."

(One of letters referred to.)

From Messrs. Somerville & Co., April 25th.—"The teas we have tested with the patent lead kept just as well, if not better than the ordinary lead in use."

From Messrs. Layton & Co., to the Chartered Mercantile Bank of India, London and China.—"'Patent Lead Lining.'—We have examined very carefully the lead used in packing of tea from above estate (Gartmore), and so far as the condition of the tea is concerned we are unable to find any particular objection to it the smell and taste being sound and good, &c."

Messrs. G., W. & S., London, June 27th.—We have the following report on your lead from our friends, Messrs. H. & E. Musgrave, one of the largest dealers in the North of Ireland:—"We have a very satisfactory report from our customers in favor of the new lead lining of 'Gartmore' chests. Lead is kept in better position and tea not so liable to get between lead and wood."

—ED. *T. A.*]

CATTLE AND CATTLE DISEASE IN CEYLON.

Kandy, August 1st.

DEAR SIR,—I have just heard of a new introduction, into Colombo of cattle murrain, no doubt caused by the cattle coming over from India at this inclement season, and being left to stand under drenching rains.

As cholera is developed and propagated among human beings, so are animal diseases. Will we, in this poor country ever learn that our cattle are our wealth? Where is the Mayor of Colombo? and where W. A. de Silva? who has been *teaching* ere he has learned himself. Has a whole 12-month's murrain not taught anything? are we to be subjected again and again, until the cattle of the country are exterminated?

A few days ago I met a herd being driven along the road (our beef supply), coming from the lowcountry tanks, where they had been fattening—driven under our drenching rains, penned into a cold upcountry cattle shed at night; murrain developed no matter as long as the tamby gets rid of them, he cares not.

See what the *diseased drove*, which arrived in Nuwara Eliya last May or June, did for the country: the contagion they brought is still at work; after thousands and thousands of our village and cart cattle have been swept away, now another centre of contagion has (as report goes) been formed in Colombo

It seems to be no one's interest and less anyone's duty to put a stop to this ruin which will sooner or later be the means of killing out the goviya of Ceylon.—Yours faithfully, TRUTH.

MR. LIPTON AND THE TEA FUND.

Kandy, August 16th, 1890.

MAKING KNOWN CEYLON TEA.

SIR,—With reference to the minutes of proceedings of the Standing Committee of the "Tea Fund" recently published under the above heading, I think it right to give the same publicity to the enclosed copy letter from Mr. Lipton's representative received today.—I am, sir, yours faithfully,

A. PHILIP, Secretary.

(*Copy*): Colombo, Aug. 15th, 1890.

A. Philip, Esq., Secretary,

Planters' Association of Ceylon, Kandy.

TAYLOR TESTIMONIAL.

Dear Sir,—Before leaving for England Mr. Lipton instructed me to forward you a small donation to this fund, and I have now the pleasure to send you a cheque for R35 (R25 on Mr. Lipton's behalf, and R10 on my own).

Allow me to take this opportunity of cordially accepting the resolution passed at the recent meeting of the Tea Fund Committee with regard to Mr. Lipton's estates subscribing to its income. Mr. Morison's letter of withdrawal being written under a misapprehension, I am happy therefore to tell you that these subscriptions will be continued as before.—I am, &c.,

(Signed) FRANK DUPLOCK.

SUCCESSFUL CACAO CULTURE.

Uva, August 12th.

SIR,—Your correspondent "U P" wishes to learn the whereabouts of cacao estates giving their 3, 4, and 5 cwt per acre all over.

Of the last named class I know of none, and though there may be half-a-dozen exceptions in Ceylon—*o fortunati nimium agricolae*—they are situated chiefly, I fancy, in some imginary Eldorado (the pagoda tree being grown for shade) existing chiefly in the minds of sanguine proprietors.

But it may interest him to learn that all the older cacao under shade in Monaragala district gave last year crops of 2¾ to 3½ cwt. per acre, even the former leaving a handsome profit at present prices.—Yours, &c., 102s 6D.

COTTON IN UDAPUSSELLAWA.

Public Works Bungalow, Delmar Estate,
Udapussellawa, Aug. 1890.

DEAR MR. EDITOR,—I send by this post cotton from 10 pods of Pernambuco or kidney cotton grown here, as also 4 pods and some seeds I have

not weighed the cotton, but if you think the information is worth giving to the public, please give weight. The tree grows for years. I have seen trees near Kegalla and Nawalapitiya loaded with pods and said to be from 10 to 15 years old. The oil from seed is used as medicine by the natives, the refuse I should think would be as good as castor cake. During the cotton famine I sent a sample through Messrs. C. Shand & Co. to Liverpool and was offered 2½d *sterling more* per lb. for it than was being paid for Tinnevelly at the time. The sample I sent was grown on Cadurnally, Dumbara. I had 25 trees each, Sea Island, Barbados, Nankin, Pernambuco, I got the latter name from Dr. Thwaites of Peradeniya.

I gave a lot of the seed which was given to the Cotton Spinning Company, perhaps the Managing Director of the cotton trinity might inform us of its worth as compared to other cotton now grown in Ceylon.—Yours very truly,

JAMES ROBERTSON.

[We referred the cotton to the Hon. Mr. Mitchell, who writes:—"I return Mr. Robertson's letter you sent me with the Pernambuco cotton, sometimes called Peruvian and Kidney. The seed weighed 748½ grains and the clean cotton weighed 282 grains. The percentage of clean cotton was thus about 28. This kind of cotton is about the best the natives can grow as it is hardy, bears well, and is a perennial. The difficulty is to get seed in quantity. The cotton is of similar value to the Egyptian sort, and we value it locally at 30 cents per lb. clean."—ED. *T. A.*]

"TEA FOR PRICE."

SIR,—Will you inform me through your columns what is the correct definition of the term so often used by London brokers in their circulars "Tea for price."—Yours truly,

INTERESTED IN TEA.

[We referred to a leading tea buyer, who replies:—"I cannot give you an exact definition for teas coming under this heading of 'Teas for price'—so much would depend on market and range of values. All classes and qualities selling at and under about 10d I should consider 'Teas for price' now.—ED. *T. A.*]

MR. JOHN HUGHES ON TANNIN IN TEAS.—Until the appearance of Mr. Hooper's paper and figures, the popular idea certainly was that the delicate flavour, so conspicuous in high-grown teas (Darjiling and Kangra Valley teas, for instance), was due to the smaller proportion of tannin contained in such teas, compared with low grown Assams and others of similar character. Mr. Hooper's experiments led him to an opposite conclusion, and he was induced to believe that the tea which contains most tannin is the most valuable. Mr. Hughes, in his letter to the Planters' Association, which we publish further on, is not willing to receive Mr. Hooper's conclusions, because the facts do not seem sufficient to justify them. Mr. Hughes is specially not prepared to receive Mr. Hooper's dictum that the proportion of tannin in tea can be affected by neither altitude nor process of manufacture. The questions at issue are so interesting and so important that we cannot doubt the ready acceptance by the Association of Mr. Hughes's offer to conduct, at a specially moderate scale of remuneration, analyses of Ceylon teas with a view to determine the proportion of tannin in such teas. The results compared with average selling prices will justify conclusions as to the points at issue, and may lead to improvement in modes of manufacture.

TEA BLENDS.—"What is a tea blend is the question agitating the minds of tea dealers in the old country and the *Home and Colonial Mail*—see the *Tropical Agriculturist*—discusses it at some length. Of course grocers can sell any blend they like if they truly describe it. But it is melancholy to see the immorality of the pleas put forward. Deliberate falsehood is condoned as merely Pickwickian story-telling!

TEA IN JAPAN.—The *Japan Weekly Mail* of 28th June says:—The Tea trade has slacked off somewhat, which may be attributed to two causes, the quantity already fired—nearly 20,000 piculs more than at the same date last year, and to the inferiority of the second crop leaf, which is said to be decidedly poor in cup. Notwithstanding that sales have dragged to some extent, prices remain unaltered.

MILK.

Cow's MILK has a stronghold in our dietaries. Its plastic powers are considerable, and with its richness in butter the equilibrium of this plastic power is maintained by a corresponding amount of carbo-hydrates (*i.e.*, sugar).

With regard to the characters and qualities to be sought for in the milk when drawn from the cow, the supply presents different characters during the three successive periods of the operation. The milk, of a bluish tinge at first, chiefly consists of whey or serum, with a small proportion of casein, and no butter. In the second period the secretion is white, containing less whey, a larger proportion of casein, and very little butter. The fluid during the third stage acquires a yellow colour, due to the presence of the butter; some casein is present, and the amount of whey considerably diminished.

One of the disadvantages of cow's milk is the peculiar solid character of its cured, which irritates and inflames the infant or invalid stomach. This disadvantage, however, is obviated by the use of a Zymine Peptonizing Powder, which has the property of predigesting a pint of milk, and so rendering it fit for any stomach, no matter how perverted the digestion may be.

The milk of the cow when predigested by means of such a powder yields a product almost identical an physiological, chemical and physical properties with human milk. So remarkable a resemblance to woman's milk is yielded by this digestive agent that it suggested to Prof. Leeds the term "humanized milk," as aptly descriptive of the product.

Artificial feeding is far from being considered as *necessarily* prejudicial to health. The conviction is more and more frequently finding utterance from physicians specially acquainted with this subject that feeding by means of a good bottle, such as the Burroughs, Wellcome & Co.'s Patent Thermo-Safeguard, is to be preferred to the services of a wet nurse; and thus, if cow's milk can be made to to agree with an infant, it is to be preferred to mother's milk, in cases where this is not of normal quality and quantity.

Cow's milk, owing to its variable quality, its tendency to undergo putrefaction, and its absorbent character, ought to be obtained from a good diary where it is not likely to absorb germs of disease. We have known scarlet and typhoid fever traced to milk standing in the houses of farmers whose families happened to be suffering from one of those diseases, and from its afterwards being delivered by the milk dealer to his customers. Again, adulteration and dilution are generally widespread, and in towns are often a just subject of complaint. "*Health* London.

THE IMPERIAL BRITISH East African Company have appointed Mr. J. R. Dudley McAllister their engineer to carry out the construction of the railway to which Mr. Stanley alluded in his speech at Newastle, extending from Mombasa on the coast to Lake Victoria Nyanza, a distance of about 400 miles. Mr. McAllister has left London for this object.—*Public Opinion*, July 18th.

CEYLON HALF-CHESTS OF TEA.—The question of the absurdly small contents of Ceylon "half-chests" continues to exercise the minds of both dealers and grocers. As has been frequently pointed out, when ordering a half-chest, the buyer expects to obtain not about 30 lb., but from 50 to 60 lb. of tea, and makes his purchase accordingly. From the importer's point of view, the dock rate of charges makes the half-chest of 60 to 70 lb. by far the cheapest package to handle; and from the grower's, there is to be remembered that the larger the package the less wood is of course required to hold the same amount of tea. It is, therefore, everyone's interest to maintain packages of reasonable size, and although this has often been pointed out, no steps have apparently been taken to meet the wishes of the trade. —*Produce Markets' Review.*

THE NETHERLANDS INDIA SUMATRA TOBACCO COMPANY have issued a circular to their shareholders stating that the total of the 1889 crop is somewhat smaller than originally calculated upon, as in the process of fermentation the tobacco lost a higher percentage in weight than was expected. The prices realised for the parcels already sold are highly favourable; and, although the quality of the tobacco not yet arrived is not quite so good as that of the portion already sold, the directors feel confident that the result of the company's first year's operations will prove satisfactory, and an interim dividend will be declared as soon as possible after the sale of further parcels. Reports about the 1890 crop continue to be of a favourable nature. By last mail advices, dated May 15th, 2,497,300 trees had already been planted, and the head administrator states that unless anything very unforeseen should happen a much larger crop can be expected for the current season.—*O. Mail.*

SOME PALM TREES furnish a sweetening juice. The most famous of these is probably the *Areng*, or sugar palm of Amboyna (*Arenga saccharifera*) which grows in the Indian Archipelago. * It is a superb tree, with pinnate leaves twenty-five feet long and is as handsome as it is useful. A number of species belonging to the different genera furnish a kind of hair of finer or coarser texture. It is found in the fibrous sheaths of the leafstalk and in the jagged edges of the leaves. Cables made of the black tough fibres of the *Areng* are preferred by the coasting sailors of the Spanish colonies on account of their elasticity and durability: and they are, moreover, very fine. The hemp palm of Japan and (*Chamærops excelsa*) is available in the hands of the industrious people of those countries for making the finer brooms, light strings and a thousand articles of daily use. Palms of coarser fibre, like the *Piaçaba* of Brazil (*Leopoldinia piassaba*), furnish material for blinds, brushes, brooms, and the rollers of mechanical sweepers, which are much more durable than rollers fitted with steel teeth.—*Indian Agriculturist.*

* Specimens of this the great sugar palm of Java are growing near the banyan tree close to Muirburn, Colombo. It is closely allied to our kitul palm, but there is the difference that the fruits of the arenga are edible, while those of the kitul are not. Old trees in the Peradeniya Gardens have borne fruit. For ornament as well as utility the *arenga* ought to be extensively cultivated in Ceylon.—ED. *T. A.*

THE TEMPERATURE OF THE GROUND.—At Calcutta the soil is, on the average, 2·7° hotter than the air, at Allahabad 2·4° hotter, at Jeypore (where the soil on which the instrument is placed is almost pure sand) 5·8° hotter, at Lahore 6·6° hotter.—*Indian Meteorological Report.*

MASKELIYA, July 20th.—Paper lining will *never* do, however cheap, for tea boxes; tea must be hermetically sealed to keep. A voyage from the estate to London now-a-days is no test. Look at the sample tins sent by post. All open, and yet for the short time the tea keeps fairly well. Navy and Army contractors have to guarantee the tea to keep for 2 years!—Heavy rain here for last 3 days.

QUININE.—According to the annual report of the directors of the Amsterdam Quinine Works, the results of the year 1889 were satisfactory. The deliveries of quinine sulphate (irrespective of other quinine salts) from the works during the past year have been about 400,000 ounces, and the accounts show a profit sufficiently large to admit of the payment of a dividend of 6 1-5th per cent.—*Paramatical Era*, June 15th.

TEA IN JAPAN.—The *Japan Weekly Mail* of 24th May says:—"The Tea Trade has been large—nearly 23,000 piculs of leaf having been taken during the week. It is estimated that first crop pickings will be all in hand by the end of the first week in June, and then show a shortage of production as compared with last year of 20 per cent. Another week, however, must elapse before anything like a trustworthy statement can be made as to the probable first crops outturn."

COCOA ADULTERATION.—Mr. T. A. Pooley, the county analyst for Essex, reported to the Essex County Council, on Tuesday, that the only sample of cocoa examined was also adulterated. Butter came next to milk in number of adulterations, but most of the cases are offences against the Margarine Act. Flour was added to the mustard, and starch and sugar to the cocoa. In the cocoa case no proceedings were taken, as it is doubtful whether to use the constituents found really constitutes adulteration, since commercial "cocoa" is a compound article, and is never made in a state of absolute purity. The value of this article as a food, however, is greatly reduced when more than half of it is made up of starch and sugar, as was the case in this instance. —London *Grocer.*

MANUFACTURES IN MALABAR.—There are a variety of manufactures carried on in the Malabar District. The Basel Mission has four cotton weaving establishments, which turned out during the year 1889-90 about 150,000 yards, valued at R80,000. It has also a tile factory at Calicut, the value of the outturn being estimated at R40,000. It employs 200 workmen. There is also a tile factory at Ferok, owned by an enterprising Parsee Firm, Messrs. Maneckji & Co., employing 100 individuals. Messrs. Volkart Brothers and Messrs. Pierce, Leslie & Co., have extensive coir manufactories at Cochin and Calicut respectively. Messrs. Volkart Brothers' out-turn is about R20,000 annually. There is a cotton mill in Calicut taluk established in 1888-89 under the name of the "Malabar Spinning and Weaving Company." It has not yet commenced weaving but it employs 400 individuals and turns out annually 1,185,900 lb. of yarn estimated at R487,790. Messrs. Henke & Co., have a cigar factory which turn out cigars valued at R5,000 per annum. Palghat is noted for its fine mats, the best kind fetching very high prices, and brass vessels are manufactured at Kunhimangalam in Chirakal and Cherpolcheri, in the Walawanad Taluk.—*M. Mail*, 22nd. July.

SPRING VALLEY COFFEE COMPANY, LIMITED.

REPORT.—To be presented to the Twenty-fifth Ordinary General Meeting, of the Company on Thursday, the 24th day of July, 1890, at 12 o'clock noon.

CROP 1888-89.

The out-turn of the Coffee crop for this season proved satisfactory, the total weight sold in London being 2,607 cwts. 1 qr. 11 lb.; this brought an average of 96s 9d per cwt., the value of the crop amounting to £13,065 7s 10d.

The yield of Tea on Spring Valley amounted to 86,458 lb., and this, altogether with the Tea bought from neighbouring estates sold at an avorage of 10¾d per lb., the value of the proceeds being £4,425 5s 4d.

The weight of Tea sold in London from Oolanakande estate was 13,128 lb., at an average of 8¾d per lb., the total value of Tea from this property being £511 19s 3d.

Cinchona Bark to the extent of 36,969 lb. was harvested on Spring Valley, which sold for £585 11s 1d, or an average of 3¾d per lb.

The total value of all produce sold during the season was £18,588 3s 6d, while the year's expenditure in Ceylon and London, after allowing for profit on exchange, amounted to £13,498 11s 11d, thus showing a profit on the season's working of £5,089 11 7d; to that has to be added the balance of £586 5s 8d brought forward from last year, giving a total of £5,675 17 3d at the credit of Profit and Loss.

On the 10th January last an interim dividend of 2½ per cent. was paid on the capital of the Company, absorbing £2,000 of the above amount, and the Director now recommend the payment of a further dividend of 1½ per cent., making 4 per cent. for the year, free of income tax. To meet this dividend a sum of £1,200 will be required, leaving a balance of £2,475 17s 3d to be carried forward to next year.

CROP 1889-90.

When the interim dividend was paid in January, and indeed up till quite lately, the Directors had every reason to believe that they would be able to recommend the payment of a divend at the same rate at the present time, but from Reports lately to hand from Spring Valley it is seen that the Coffee Crop for the above season will fall far short of estimate. The origiual estimate was 1,200 cwts., but it is feared that a total of only 800 cwts. will be secured; so large a shortage on such a small crop is very disappointing, and with the present good prices ruling for Coffee means a very considerable reduction on the year's returns. The Board, therefore, think it judicious to carry forward a much larger sum at the credit of Profit and Loss than would under other circumstances be necessary.

It has been the policy of the Board to retain the Coffee on Spring Valley as long as possible, and everything that skilful cultivation could suggest and the means of the Company permit, has been done with this object. Up to the present time this policy had been attended with success, sufficient revenue having been obtained from the area under Coffee to enable the Company to pay fair Dividends, and also to provide considerable sums of money for the necessary outlay on planting up large areas of Tea, and on the erection of factories and machinery for the manufacture of the leaf.

The season for Crop 1890-91 opened well, the Coffee being healthy, and there being every indication that good blossoms would result which the trees would be well able to mature, they being comparatively free from diseaso. The Directors, therefore, are much disappointed with the recent reports from Spring Valley announcing severe attacks of green bug and leaf disease which may materially affect the Coffee crop.

It was hoped that these pests were disappearing as the Coffee looked so healthy, but the regularity of their return, thus rendering the tress too weak to mature their crop, coupled with the small yield to be secured for season 1889-90, viz., 800 cwts. off an area of 970 acres, has compelled the Directors to give instructions to plant up 108 acres of the weakest and least remunerative Coffee in Tea, thus leaving 862 acres still under Coffee, while it is very possible that, year by year, this area may have to be gradually converted into Tea, unless, as is hardly to be expected, the pests which are attacking Coffee should disappear.

The Tea on Spring Valley is now maturing well; the crop for 1889-90 is estimated at 113,000 lbs., and from the way in which the bushes are improving as they gain age, the crop for 1890-91 should show a material increase on this figuro.

Extensive manuring operations aro being carried out on Spring Valley, both on Coffee and Tea, and as tea responds in a remarkable way to applications of manure, the best possible results are anticipated from this work.

The market for Ceylon tea is well supported, and the average price for crop 1889-90 will show an improvement on that obtained last year.

The following table shows the total area now under tea on the Company's properties:—

TEA.

			acres.
Planted Nov./Dec.,	1884,	on Spring Valley	... 271
,, May,	1885,	on Oolanakande	... 143
,, Nov./Dec.,	1885,	on Spring Valley	... 230
,, May,	1886,	on Oolanakande	... 7
,, Nov./Dec.,	1888,	on Spring Valley	... 20
		Total area under tea	671
To be planted during 1890 on Spring Valley			108

UVA COFFEE COMPANY, LIMITED.

CAPITAL £100,000, IN 10,000 SHARES OF £10 EACH.

Report to be presented to the Twenty-seventh Ordinary General Meeting of the Company, to be held at No. 5, Dowgate Hill, London, on Thursday, the 24th day of July, 1890, at 1 o'clock p. m.

CROP 1888-89.

The Coffee Crop for this season was estimated in the last Report at 1,500 cwt., aad it will be seen by reference to the Accounts that the actual outturn, as nearly as possible, amounted to this qnantity. The average price of the Coffee sold in London was 96s per cwt.; the total proceeds derived from the sale of this product being £7,183 2s 3d.

The estimated Tea Crop was 177,000 lb.; the actual yield from the Company's estates being 170,150 lb. The Tea brought an average price of 11d per lb., and inclusive of that bought from neighbouring estates, the total proceeds amounted to £12,320 18s 3d.

Cinchona Bark, to extent of 147,715 lb., was sold at an average of 4¼d per lb., producing £2,678 5s 10d.; 22 cwt. of Cocoa were also sold for £92 7s 10d, making the total valne of all produce for the season £22,274 14s 2d.

The total expenditure for the year in Ceylon and London, after allowing for Profit on Exchange, amounted to £20,426 1s 9d (inclusive of not less than £2,700 spent on Tea factories, machinery, &c., and over £400 in adding 67 acres to the Tea area). There is thus a profit of £1,848 12s 5d on the season's working. To this has to be added the balance of £220 0s 3d brought forward from last year, giving a total sum of £2,068 12s 8d at the credit of Profit and Loss Account.

An interim dividend of 1 per cent on the capital of the Company was paid on the 10th of January last, which absorbed £1,000 of the last named sum, and the Directors now recommend the payment of a further dividend at the samo rate, making 2 per cent for the year free of Income Tax. To meet the dividend now proposed the sum of £1,000 will be required, leaving a balance of £68 12s 6d to be carried forward to next account.

CROP 1889-90.

The outlook for this season is fairly good. The Coffee Crop is estimated at about 1,400 cwt., and the yield of Tea from the Company's estates is expected to reach a total of 250,000 lb., exclusive of bought leaf. The good prices which have ruled for Coffee for some-

time past still continue, and it is thought that the whole of the Crop will be disposed of at very satisfactory rates. The Tea market is also well supported, and it is hoped that the average price of the whole Crop will certainly not be less than last season's. Should the Directors' expectations as regards Crop and prices be realised, a fair profit on the year's working should result.

Bearing in mind the present value of Coffee, everything possible has been done to retain this product on the Company's estates, and in spite of the yearly disappointment brought about by steadily diminishing crops, hopes have been entertained that the two pests, Green Bug and Leaf Disease, might in time disappear, but it is difficult to entertain such hopes any longer. The Coffee trees looked vigorous and healthy, and everything was in favour of a good Crop for season 1890-91, but last accounts to hand from the Estates report very severe attacks of both Green Bug and Leaf Disease, which cannot but affect the out-turn of that Crop.

Under these circumstances, the Directors have resolved to plant up in Tea 270 acres of the weakest Coffee, still leaving 942 acres under Coffee, which may gradually have to be planted up in Tea in future years.

It is satisfactory to report that all the Tea on the Company's properties is thriving well, and from past results the Directors have every reason to anticipate a continued improvement, both in point of yield and quality as the Tea gains age. As Ceylon Tea daily increases in favour, there is no reason why the present range of prices should not be maintained.

The Company have on their estates Wire Tramways and other appliances which enable manuring operations to be carried out most expeditiously and cheaply, and from this work, which is now being undertaken on a large scale on the Company's properties, the best possible results are looked for, as the Tea bush responds to manure in a most marked manner, and within a few months of its application.

The area under Tea is as follows:—

TEA.

Planted Nov. Dec.	1883	9	acres
"	1884	347	"
"	1885	448	"
"	1886	27	"
"	1887	17	"
"	1888	67	"
"	1889	12	"
Total area under Tea		927	
To be planted during	1890	270	acres

TEA AND DARJEELING.

Sixty-five inches of rain had been gauged since the 1st January to date. Taking the average rainfall to be 120 inches in the year, it will be seen that a little more than half our usual allowance has reached us, while if the season is at all a normal one we may count our rain until the first week of October. A very considerable amount of damage, as was to be expected, was done by the deluge, and for a few days through booking of passengers on the D.-H. Railway had to be suspended. The line was completoly blocked near the 38th mile by a huge rock. With the help of dynamite the obstruction was removed in a little over 48 hours. It was rather amusing, though excessively aggravating, to notice how very quick the local petty shopkeepers were in taking advantage of the line being blocked. Up went the price of their wares fully 50 per cent. and at once: so that the public loss was their gain. The line has been damaged near Kurseong, and again near Gyabaree Station, where the Puggla Jhora—very appropriately so called —broke loose and carried away a large portion of the retaining wall, which had stood so well almost since the line was completed. Your readers will see from this rough sketch that the traffic branch of the Railway have had by no means an easy time of it in keeping communication open with Silligorie. From what I have seen the quality of tea is very satisfactory. Davidson's Sirocco tea drier does require four men to look after it, and does not dry off the leaf in the time stated by the prospectus. I say this after watching one of them at work several times. Still, the new drier is an improvement on his earlier driers, and no doubt when these points have attracted Mr. Davidson's attention—it has been drawn to them already I know—he will set to work to remedy these undoubted defects.—*Indian Planters' Gazette*, July 22nd.

TANNIN IN INDIAN AND CEYLON TEAS.

Analytical Laboratory, 79, Mark Lane,
London, E. C., July 18th.

John Hughes, Agricultural Analyst, to A. Philip Esq., Planters' Association, Kandy.

"TANNIN IN INDIAN AND CEYLON TEAS."

Dear Sir,—In the *T. A.* for last February there is on page 562 an abstract of a paper on the above subject. The original paper was communicated to the "Chemical News" of December 27th, 1889, by Mr. David Hooper of Ootacamund, and as the analytical results are interesting and worthy of being confirmed or refuted I send you a copy of same.

You will observe that out of 65 samples of tea examined for tannin, only six represent estates in Assam at the comparatively low elevation of 600 feet. All the others represent tea grown at an elevation ranging from 2,500 feet in Travancore to 7,800 feet on the Nilgiris, the tannin per cent being 19·95 in the former and 13·55 in the latter. Practically, therefore, these teas represent the hill gardens, and not the plains of lowlying gardens of Assam, and as such it is not at all remarkable that the proportions of tannin should agree closely with that produced on the Ceylon hills.

In the 13 Ceylon teas examined by Mr. Hooper in his report the tannin ranged from 15 per cent in a sample of pekoe souchong from Yellangowry estate 2,500 feet, to 20·87 in broken pekoe from Kanangama 200 feet. Here we have a difference of nearly 6 per cent in favour of the low grown tea; though curiously enough in a sample of broken pekoe from Glenorchy 5,700 feet Mr. Hooper found as much as 19 per cent. Before, therefore, disputing Mr. Hooper's conclusions, namely that the amount of tannin present in tea is not influenced either by *elevation* or *manufacture*, I would respectfully ask, Are his facts correct? At present his conclusions are certainly in advance of his facts, and the very opposite of popular opinion based on practical experience.

Mr. Hooper tells us that the figures for tannin given in the list of the 65 samples represent the total amount of this constituent obtained by perfectly exhausting the leaves, and do not represent the amount taken in domestic use. Further that the usual teapot infusion of ten minutes removes only one-third of the total amount.

Therefore all the 65 examinations for the total amount of tannin present in these several specimens are of little practical use in showing the actual available tannin for domestic requirements.

What would be really useful information to the planter, and also interesting to the tea-drinking public, might be obtained if the proportions of tannin were carefully determined with a 1 per cent infusion after standing for ten minutes.

With our present information it is only reasonable to conclude, that not only the *elevation*, but the mode of cultivation, manufacture, season of the year, variety of plants and general skill brought to bear upon the industry, must exercise a very great influence on the quality of tea produced, and on the strength of same as indicated by the proportions of what I may term the available tannin.

According to Watt all tannins are remarkable for the avidity with which they absorb oxygen, especially in the presence of alkalies. This remark, I think, should be considered in connection with the operations of withering and rolling.

The temperature as well as the humidity of the atmosphere must have an important influence in increasing or retarding the chemical action set up after rolling. Again in regard to firing it is quite possible that over-firing many render a considerable portion of the tannin insoluble, and so reduce the proportion of available tannin in the made tea, causing it to have less strength than it otherwise would have had. I understand from Mr. Leake that reliable samples of Ceylon tea from well known estates could easily be obtained in London together with the actual market value of same, so that there would be no necessity to send samples from Ceylon more especially as such samples would not represent the bulk delivered this side, so perfectly as samples expressly drawn for market purposes on arrival.

If the Association should desire to have such a series of determinations of tannin made I may mention that the expenses would not be great, and I should make the analyses at a specially low rate of charge for the members of your Association.—Awaiting your reply, believe me, dear sir, your's faithfully, (Signed) JOHN HUGHES.

THE TOMATO-CURE FOR DYSPEPSIA.

Don't talk to me of colocynth or famed cerulean pill,
Don't mention hyoscyamus or aloes when I'm ill ;
The very word podophyllin is odious in mine ears,
The thought of all the drugs I've ta'en calls up the blinding tears :
The Demon of Dyspepsia, a sufferer writes to say,
At sight of the Tomato-plant will vanish quite away.

The Faculty will diet you till indigestion stops,
On what have always seemed to me interminable slops ;
A dainty dish is sure to be the worst thing you can eat ;
The bismuth and the charcoal come like nightmares after meat.
Away with all restrictions now, bring mutton, beef, and veal,
As long as ripe Tomatoes come to supplement a meal.

Hepatic action, doctors say, is very hard to start,
And if you have too much of it, that also makes you smart ;
And so the fate of many folks, especially in town,
Is first to stir the liver up, and then to calm him down.
Now he can trouble us no more, although we go the pace ;
A diet of Tomatoes keeps the tyrant in his place.

Away with deleterious drugs, for here's a plant been found,
Worth all the weird concoctions that dispensers can compound:
Get fresh Tomatoes, red and ripe, and slice and eat, and then—
You'll find that you are liver-less, and not like other men.
Come ye who dire dyspepsias's pangs impatiently endure,
It cannot hurt, and may do good, this new Tomato-Cure.

—*Punch.*

INSECT PESTS: THE HELOPELTIS PESTS OF CEYLON CACAO AND INDIAN TEA.

Vol. 1, No. 4, Indian Museum Notes, edited by Mr. Cotes, possesses a painful interest, in its very full and copiously and carefully illustrated descriptions of the species of *Helopeltis* so destructive to cacao in Ceylon and to tea in India. In Ceylon, as yet, we have happily escaped the prevalence of "mosquito blight" on our tea, and we trust the exemption may continue, for it is deplorable to read of the ravages of this species of *Helopeltis* in India, where the crops of tea are on some estates reduced by one half or more by the tapping and sucking operations on leaves and stems of swarms of the insects. No fewer than 25 pages of the number we are noticing are taken up with Mr. E. T. Atkinson's paper on the genus *Helopeltis*. Readers specially interested ought to obtain copies of the Calcutta publication. For the information of our readers we reproduce the engraving of *Helopeltis theivora*, in its various stages, with the characteristic horn shewn separately. We also quote some of the most interesting portions of the text:—

RHYNCHOTA. BY E. T. ATKINSON, B.A., C.S., C.I.E.
MOSQUITO BLIGHT.

In this paper, reference is made principally to the species of the genus *Helopeltis* of the family *Capsidæ*, belonging to the sub-order Hemiptera-Heteroptera of the Rhynchota. The genus comprises the insects so well known as the 'mosquito blight' in Assam and Sikkim, as the 'roest' or 'rust' in Java, and under similar names wherever the tea plant is cultivated. Species of this genus have been reported from the Philippine Islands, Java, the Eastern Archipelago, Ceylon and India, and are of considerable economical interest from the ravages that they commit. It was my intention to prepare a monograph of the entire genus, but this could only be done with fresh materials, and it appears to be desirable to summarise here what is known regarding the genus, and ask those interested to forward fresh specimens in weak alcohol for a fuller description of the species.

Genus HELOPELTIS, *Signoret.*

Ann. Soc. Ent. France (3s.), vi, p. 502 (1858).

First joint of the antennæ as long as the head and the pronotum taken together, second joint longest, 3—4 joints short: scutellum with a spine on the disc: side of the abdomen reaching beyond the hemelytra. Signoret placed this genus in the subdivision 'unicellules,' formed to contain those genera in which the membrane has but a single cellule the head transverse and truncate beyond the eyes, the antennæ long and slender, ocelli wanting, and the pronotum narrowed anteriorly. The division to which *Helopeltis* apparently belongs is represented in Central America by Distant's '*Valdasaria*' (Biol. Cen. Am. Hem., p. 242).

Then comes a notice of *Helopeltis antonii*, Signoret:—

Black varied with red: head black, rostrum yellowish: antennæ black, yellow at the base: pronotum and pectus sanguineous: scutellum red, spine yellow cup-shaped at the apex: hemelytra brown-yellowish deeper at the base than at the apex, median portion transparent: abdomen yellow, with a basal spot and apex, black: feet black: femora nodulose, the first pair, with a yellow ring at the base, intermediate pair of a lighter colour, varied with yellow; last pair with a yellow ring at the apex (*Sign.*) Long, 11 broad, 2 mill.

A description by Waterhouse of specimens received by him from Ceylon is given, and we quote thus:—

Reported from Ceylon. Dr. Trimen, in *Nature* for October 23rd and December 25th, 1884 (Vol. xxxi, p. 172), remarks that this species is found on the cacao and is its only formidable enemy. In the same Journal for October 30th, 1884, Mr. W. L. Distant states that he had received from Ceylon mutilated specimens of a Reduviid which doubtless occurred with the Capsid *H. antonii*, easily known by its nodulose femora and the spine on the scutellum. The Reduviid, however, probably feeds on the Capsid, and from its similar form and size may be confounded with the really injurious insect, so that in taking measures against these pests the Reduviid should be spared.

Next comes a description of *Helopeltis bradyi*, Waterhouse.

Mr. Waterhouse obtained this species from Java, where it was reported to have done much mischief on the Cinchona plantations.

Next we get *Helopeltis niger*, Walker. Then follows *Helopeltis braconiformis*, Walker, reported from New Guinea.

Helopeltis febriculosa, Bergroth.

This species was found amongst a number of *Disphinctus humeralis*, Walker, sent by me to Dr. Bergroth for identification. All were collected on the Cinchona plantations at Mungphu in Sikkim by Mr. Gammie, where this species was found on *Cinchona calisaya*, and occasionally on *Cinchona succirubra*. It has not occurred yet in sufficient numbers to do much damage; but as it belongs to the same genus as the destructive 'Mosquito pest' of the tea, its operations should be carefully watched. *H. febriculosa* is allied to *H. theivora*, Waterh., but is distinguished by the erect, very little curved scutellar horn; in *H. theivora*, ♀, the horn is much curved: this difference, however, appears to be merely of varietal importance.

Helopeltis pellucida, Stäl.

Reported from the Philippines. *Helopeltis collaris*, Stä

Reported from the Philippines. *Helopeltis podagrica*, Costa.

The habitat is not recorded. *Helopeltis romundei*, Waterhouse.

Hab Java: on tea.

We can testify from personal observation the truly fearful effects of *Helopeltis* on tea in Java; and the following full account of the Indian species shews how heavily it handicaps the Indian tea planters :—

Helopeltis theivora, Waterhouse. *Plate XII, fig.* 2.

Helopeltis theiovora,? Moore, Wood-Mason, Tea-bug of Assam, p. 12 (1884): Proc. Agri. Hort. Soc. Calc., 20 Nov. 1873, and v, p. xviii, xxviii (1878); Westwood, Gardener's Chronicle, Feb. 21, 1874. *Helopeltis theivora*. Waterhouse, Trans. Ent. Soc., p. 45, t. xi, f. 3 1886.)

♀ Black: pronotum orange-yellow, with a black line near the anterior margin, the base margined with black: scutellum brown, black at the base, spine or horn long, much curved, black, at the apex brown: antennæ dark brown, basal joint paler, yellow at the base: femora dark brown, mottled with light brown, with a light-yellow ring at the base: tibiæ light brown, speckled with dark brown (*Waterh.*) Reported from Assam, Sikkim. Easily recognised by the long and curved spine on the scutellum. Mr. Moore does not appear to have described this species, so that Mr. Waterhouse must be considered as having named it. There does not appear to be any fixed time for the appearance of the insect or seasonal broods. The eggs are found apparently both in the axils of the young buds and on the lower leaves, but this is a point requiring further examination. The larva is about 1-16th inch long, obtuse, soft with a very small, clavate caudal appendage; colour amber-hyaline, but after sucking the juices of the green leaf for some time it becomes of a greenish colour. The head is horizontal; the rostrum is about one third to three eighths of the length of the body, and in repose lies quiescent on the pectus: two eyes, no ocelli: antennæ purplish, hemelytra rudimentary: gradually the insect increase in size and becomes of a deeper amber or orange colour, the antennæ become longer and turn to black, and the insect is less active, though furnished with complete hemelytra, which with the head and pronotum is black, whilst there is a broad white band on the abdomen. An observer informs us that the insects seem to commence tapping in February and go on till the end of August. A young larva procured by nipping off the shoot, a leaf or two below the place where it was seen, was placed in a bottle with a shoot containing a pekoe bud and leaf and a pekoe-souchong leaf. After 21½ hours it was found that this single insect had made 58 taps on the pekoe-bud, each marked by a discoloration of the epidermis; there were 48 marks on the pekoe-leaf and 18 on the pekoe-souchong leaf. The spots at first were of a brown colour but soon changed to black. Dr. Aleyboom states that these insects, in Java, repose during the day near streams and in moist ground, and feed by night, though a few may be found during the day in shady positions on the shrubs, but not on the ground. The garden referred to was surrounded by paddy-fields and near a river, and seemed to be more liable to attacks in cold and wet weather. The insects in Assam are to be found to repose in shady positions beneath the shrubs, and do not leave the area of attack. The observations of Dr. Aleyboom would therefore appear to be not of general application, but to have reference to the particular position of the garden referred to.

H. theivora is the form with which we are chiefly concerned in India, and Mr. S. E Peal of Sibságar was the first to bring to notice (Journ. Agri.-Hort Soc., Calcutta, IV (i), p. 196, 1873) that the "black blight," 'smut," &c., on tea was the work of this insect and not a spontaneous fungoid growth. Further investigations have shown that the attacks of these insects occur under all conditions of soil and climate, in high land and low, dry or wet, rich and poor, in a dry, season as bad as in a wet one, and as frequently with good culture and clean tea as with the reverse. That it is not due to "shade" or "want of cultivation" is shown by the fact that in the two worst cases, one had the garden particularly open, and in the other it was quite clean. It is difficult from one year's attack to say where the insect will appear the next year; all places appear to be equally liable to its ravages, but it seldom is seen over an entire garden at once.

Mr. Peal states that the young leaf alone is first attacked, and the more tender and succulent the shoots are, the more they suffer. The shrubs show the shoots brown and withered in a garden that has for some time felt the attacks of the insect; but if only recently attacked, the general appearance is normal, and only on the youngest shoots and twigs are a few small brown spots seen, the size of the spots varying with the age of the insect causing them. If the insect be very young, the punctures are minute and close, and the consequent discolorations coalesce and become continuous. When the larva attains its full growth, these spots become one eighth of an inch in diameter. When the punctures are recent, the colour is pale brown and darkest at the edges; but if one or two days old, the spots are dark brown, verging on black, the entire leaf curling up and withering completely if they be at all close. Where the shrub has suffered for some time and severely, the symptoms are often less visible at first sight. The dead leaves have for the most part fallen off and the minute shoots at the leaf-axils above show the damage, all being dried and dead; there is less dead leaf showing, but dead "tips" appear everywhere. Further examination will show that the affected shrub, ere it ceased entirely to shoot out, had made many efforts to grow, all of which had proved abortive, and a branch that has not yielded a single leaf presents all the appearance of having been very severely plucked. On the tips of the young vigorous shoot being punctured and its juices withdrawn by this insect, it has died as certainly as if nipped off. When the eyes below the leaf-axil shoot out, and before the insect can do serious damage, one or two shoots may attain some size and bear several leaves, but as the insect increases in size, these tips are attacked: other shoots start from other eyes, attaining, however, less vigorous growth; these too, in a short time, succumb, and the shrub becomes leafless. When this occurs growth ceases, as every shoot requires from 40 to 50 days to mature so as to be fit for plucking, and the recovery of the tea is slow unless pruned.

Dr. O. Aleyboom of Java in the same Journal (v i), p. 55, 1878) describes the attacks of this insect on tea-shrubs there much in the same manner, except that he states that it attacks the under side of the leaf He adds that the insect inserts its rostrum and remain for a long time on the same spot, and some hours afterwards the leaf shows a brown puncture that slowly turns black on the very spot where the puncture has been made. If the leaf be punctured closely it becomes black and so dry that it can be pulverised by rubbing between the fingers, and examination shows that the insect has removed all the juices from the soft part of the leaf. As in Assam, so in Java, the insect attacks first the buds and then the young leaves, and last of all the old thick leaves, until the shrub becomes leafless, and to prune it in this state is hurtful. The denuded shrubs seldom make new shoots, for the insects after having destroyed the leaves return to the parts of the twigs where the juices are gathering to send forth new shoots, and by sucking the juices there effectually prevent the development of buds. By remaining leafless the bark whitens and the wood becomes dry, and if the attacks continue for two consecutive years, the branches become covered with moss and die.

As already stated, these insects are reported in Assam to occur in all sorts of soils and under all atmospheric conditions. In Java, too, Dr. Aleyboom's researches have led to a similar result. There the soils may be divided into two classes—(*a*) those containing humus, and (*b*) those composed of red clay.

The first series comprise a mechanical admixture of humus, clay, and sand; it has a black hue, sometimes a depth of eight feet, and, when heated, it becomes red from the presence of oxide of iron, and gives off an ammoniacal odour. There are several varieties, due to the varying proportions of the constituent parts, but they usually contain mineral substances and from eight to twenty per cent of humus. The humus soils absorb and preserve moisture, and old shrubs usually thrive on them and produce a rich foliage. Young plants, however, easily fade and perish, and seeds do not develop, but rot.

The clay soils are of a brown hue, and are usually composed of fine clay and from ten to fifteen per cent of the oxide of iron, with some proportion of sand. These soils are arid, and during the rains absorb much water, drying up to the depth of two or three feet immediately afterwards, and also becoming heated. Here the tea-shrubs do not thrive except in moist seasons.

From 1869 to 1873, the shrubs in the humus soils were always affected by blight, which first attacked the leaves and the best-developed shrubs in the best parts of the garden, also the shrubs in the alluvial portion lying at the base of or between the hills. The shrubs in the red soils were at first free from blight, but they were also attacked when the fine leaves on the shrubs in the humus soils had been destroyed. Several experiments were then undertaken in order to ascertain the cause. Where the humus was thin or absent, the roots of the shrubs were top-dressed with good earth, which led to a new flush that was again attacked and destroyed by the blight. A very fertile part of the plantation was dug to a depth of 18 inches and thoroughly cleaned; in another place, furrows to the same depth were made and filled with branches of other trees; again another patch was drained; in another sticks smeared with tar and *oleum cornu cervi fœtidum* were placed amongst the shrubs; tar was also put in the ground; but none of these experiments proved successful. Large quantities of *calcium sulfuratum* were also placed on the ground, and in another part freshly-made phosphates, but the rust did not diminish. Fumigation with sulphur burned to windward only resulted in the destruction of the leaves reached by it; whilst fumigation by burning bad-smelling wood and leaves to windward had no influence at all. Pruning only gave temporary relief, and when potatoes were planted in the neighbourhood of affected shrubs, they also blackened and died.

Picking off the insects as they appear has been recommended and tried. When it is considered that if only moderately bad there are ten to twenty insects on each bush and if very bad thirty to forty, and the shrubs are planted 6′ × 3′ the number of insects to an acre—and therefore the numbers in a considerable garden—will preclude recourse being had to this procedure on an extensive scale. The insects are most injurious in the larval state, even when they are of miscroscopic dimensions, and when disturbed, however slightly, drop through the bush to the ground, where it would be useless to follow them. Picking would therefore be too expensive and unsatisfactory, as only partially clearing the bushes. In this connection Dr. Aleyboom recommends the early plucking of tips and tender leaves, so as to diminish the food-supply of the insects, which as already noted, attack those parts first. Another suggestion that cannot be recommended is to place bird-limed strings or light cotton bags smeared with some similar sticky substance in the affected areas.

Syringing as a prophylactic would be of little use in the rains, as in a day of heavy rain the substance used would be washed away. Spraying infected tips when the attacks first appear with kerosine emulsion as an insecticide appears to promise good result. It has been of practical value in the case of coccid pests on coffee, and is very simply made. The proper course suggested by the life-history of the insects is to search for the eggs, and to spray those places where they occur, for, as a rule, in the earliest stages, the larvæ are found only where the eggs have been deposited. * * *

Amongst the many remedies proposed, cutting down the forest and grass jungle adjoining plantations has found some favour. A writer in the Calcutta Journal already quoted suggests that *toon* trees may harbour the insect (November 1885), another that spear grass and other similar growths furnish the shelter. There is no doubt that in this country grass harbours vast numbers of *Capsidæ*, and it is quite possible that the original food-plant of the insect may be discovered and eradicated. It is, however, for the planters themselves to discover this, and there can be no harm in removing and burning during the cold weather grass jungle in the neighbourhood of plantations. Some support is given to this remedy by the statement of a planter that "even if destroyed on the tea plants, the insects come in from the neighbouring jungle, which should be burned down." Others say (Journ., *l. c.*, vii, p. xlii) that clearing the jungle is of no value. There is no precise record, however, in the whole of the correspondence regarding this pest of the presence of the insect on any plant other than tea or cinchona.

[This *Helopeltis* seems to be as specially and exclusively a tea pest, as *Hemileia vastatrix* is exclusively a coffee parasite.—ED. *T. A.*]

Anointing the bushes with "tar" has been recommended and tried, but abandoned, as it flavours the tea. Fumigation by burning bad-smelling weeds is reported in some cases to have kept down the pest, "but to do this successfully, the *tila* surroundings where they harbour and breed must be cleared away and burned during the cold weather."

Mr. R. B. Walker, Manager, Sookerating Tea Estate, Doom Dooma, Dibrugurh, writes:—

"Now to reply to your inquiries about what we did to get rid of the 'Mosquitoes.' To begin with, before we stopped plucking last year, and while the blight was at its worst (about September and October), I started cutting down a 'belt' of jungle 80 yards wide all round the edge of the garden; this 'belt' was completed about the same time as the pruning of the garden was finished (the end of February this was): well then I commenced lighting fires all over the place; in the tea the prunings were being reduced to ashes as rapidly as the cut-down jungle in the 'belt' was being burnt up; by the middle of March I finished all the burning I wanted to do, and then every soul was put on to hoe round the bushes, *take away all stale earth from near the stumps of the plants, and fill in fresh earth.* The pruning I went in for last cold weather was most severe; the whole of the garden nearly was cut down to within eight inches of the ground; *all* knotty and gnarled wood was removed and nothing but straight wood left. During the pruning, immediately following up the pruners were gangs of women and children armed with small knives whose only work was to rid the *bushes of every leaf and small twig.* To protect the plants from the flames (while the prunings were being burnt) a drain fifteen inches deep by a foot wide was made in every alternate row of tea, and into this the pruning *leaves, &c.*, from round about were carefully brushed before being set alight to.

"Up to date not a trace of the blight is to be seen; this time last year about 100 acres (or more) were completely ruined; the tea is looking as healthy and nice, and growth is as vigorous as though the plants had never been blighted. So successful have we been so far in combating this destructive pest, that I am convinced now we will not be troubled with it *at all* this season, and that we will make our 8 to $8\frac{1}{2}$ maunds an acre against a miserable 4 maunds an acre last season!

"The theory of letting tea run has been tried without the slightest signs of doing any good, for the simple reason the bushes *can't* and *won't* run! Bushes that I left alone during the three months (middle of April to middle of July) were, if anything, smaller at end of this period than at commencement of it, because not a vestige of growth had been made during the whole of this time, and the long healthy shoots chiefly) in the very centre, therefore the tallest part of the

bush) died gradually down to the parent stem. I have measured some of these dead shoots occasionally and have found them in some cases to be over 18" long.

"The shoots that I have found to so die down have always been of this year's growth *viz*, those shooting out from just below last cold-weather pruning.

"Now, as blighted patches here have been found to have a large number of the young of the Bug (which by the bye are in appearance like red ants, with two feelers apiece, and are wingless) in all stages of development (from the size of a pin's point to almost a full-grown bug) on nearly every bush, and as these young live right away inside the bushes and feed on only the 'minute shoots at the leaf-axils,' the theory of pruning is to give the bush pruned a severe check and so stop for a time the rising of sap (and. of course, the production of the 'minute shoots at the leaf-axils') in the hopes this brief period of the bushes' dormancy will be sufficient to kill the young bugs of starvation. Whether we have succeeded or not in destroying *any* young ones by starvation it would be difficult to say, but that pruning is doing good is quite certain. Three days ago I got 25 maunds of leaf off the piece of tea that was pruned (5 acres in June last) in July; previous to pruning, this bit of tea was *completely* shut up' for about 2½ months.

'Of course we know it is only right to cultivate and keep extra clean any tea that may be hanging fire' or doing at all badly. I reversed the order of things with a bit of about 5 acres of very badly blighted tea: I allowed it to go into 'howling jungle,' the bushes were out of sight for over a month; strange to say when I hoed and cleaned it up after a fortnight, I found the bushes quite recovered and with a very decent flush on them. The block of tea of which these 5 acres are a part presents a peculiar spectacle with its small piece of bright green healthy tea surrounded by dismal-looking acres and acres.

"Some weeks ago I tried sprinkling kerosine and water (¼ of k. to ¾ of w.) over a piece (about 2 acres) of tea: on two occasions the day the mixture was squirted I found a young dead mosquito, evidently killed by the oil having reached them. I will with pleasure report results of all experiments to you.

"I forgot whether I have mentioned to you the fact of my having found mosquito eggs on the lower and seed-bearing branches more frequently than I have come across them on any other parts of the bush: *always the old* leaves have I found covered with eggs and never have I seen an egg on a *young shoot*. I have more than once found eggs on the tea seed itself. To give you some idea of the number of eggs there are knocking about I'll just mention:—I ripped off from a bush near the bungalow all the leaves with eggs on them: on counting the leaves I found I had 1,741. Some of these were smeared on both sides. This particular bush was about an average one, and was not picked out by me, because I thought it had a larger proportion of egg-leaves than its neighbours.

"Young mosquitoes are very plentiful too; I have picked off more than 70 from one bush.

"On one occasion I pulled a seed-bearing branch off a bush and counted 33 leaves on it; *every* leaf was smeared on *both* sides with eggs, and besides this the main branch itself and the smaller ones too had any quantity of eggs sticking to them. This will show you mosquitoes are not very particular where they lay their eggs. This is quite in opposition to what others say about mosquitoes depositing their eggs in the young shoots between pekoe and souchong leaf."

Then follow descriptions of three homopterous insects found on the mango.

We quote what is said of a Cotton Pest:—

In February last Mr. E. E. Green, of Punduloya, Ceylon, sent me a small Lygaeid which, he states, infests the ripe pod of the cotton, discoloring and caking the cotton. I find it is the *Oxycarenus lugubris*, described some thirty years ago by Motschulsky. Hab. Ceylon.

A coccid is noticed, the *Coccus ceriferus* of Anderson, found on the Mango, Arjun, Pipal and other trees, and now on tea.

Signoret,* in his paper on the Coccidæ, merely quotes the imperfect description of Anderson, and gives no details. Under these circumstances I have sent examples to Mr. W. Maskell for description, as I have not leisure to take the work up myself. I do not think that there is any danger of this insect doing much damage to tea. If it does become troublesome, the application of kerosine emulsion by spraying to the leaves containing the larva will quickly destroy them and prevent their spreading. The waxy portion of the adult female may possibly be used as an article of trade like the insect-wax of the *pela* in China, but of the uses of the Indian wax we know nothing yet.

A butterfly destructive to fruit is described as *Virachola isocrates*, Fabricius, a butterfly of the family *Lycœnidœ*, of the suborder *Rhopalocera*, of the order *Lepidoptera*. It is found almost throughout the plains of India (except the desert tracts), and in Ceylon, but not in Assam or Burma.

Every fruit that is attacked by the larva dies before it is full-grown and has ripened, as the heart of the fruit is entirely destroyed by the insect. Were this pest to increase largely in numbers, it would certainly do a vast amount of damage to fruit, as is now the case with the Mango beetle.

The most effective remedy against this pest, if practicable, would be to catch the female butterflies and to destroy them before they have laid their eggs. When once an egg is laid on a fruit, that fruit is almost certainly doomed. As a further prevention against attack for the coming year, if all the fruit with holes in them were gathered and destroyed (burnt or buried), there would be but few butterflies left to lay eggs and to carry on the species during the following season.

In Miscellaneous Notes by E. C. Cotes, there is much that is interesting, but we can find room only for a few extracts:—

From Messrs. Octavius Steel & Co. were received, 11th October 1889, some specimens of a caterpillar covered with urticating hairs. The specimens, though too much decayed for precise determination, were obviously the larvæ of a moth belonging to the group Bombyces.

The following is an extract from the letter of the Manager of the tea estate in South Sylhet where the insects were found:—

"By today's post I send you in a bottle a number of caterpillar-looking insects that have been giving me a lot of trouble this year, not destroying the bushes but laming the coolies. I have sixty coolies incapacitated from work owing to this. The caterpillars, or whatever they are, lie under the edge of the bush and the coolie treads on them when plucking, his foot begins to pain, and if not on the hard sole a blister rises, and until this forms into a wound and suppurates he suffers agony and can't walk at all."

Information has been received through Mr. Lionel de Nicéville of injury done during the past year to tea in Sikkim by *Helopeltis theivora* (Mosquito blight) and *Tetranychus bioculatus* (Red spider).

The Red spider attacks the tea in spring and early summer, while the Mosquito blight is found during August and September and confines its ravages chiefly to elevations below 2,000, feet. On one tea estate alone the loss caused by the Mosquito blight in the past year was estimated at 300 maunds of tea, valued at R20,000, that done by the Red spider being even greater. It is said that the Mosquito blight has only appeared of late years in Sikkim, with the cessation of the practice of annually burning the jungle.

Preparations are being made in one garden, on a considerable scale, for sprinkling bushes attacked by the Red spider with Flour of sulphur, with a view to the destruction of the pest. Sprinkling with flour of sulphur has been found useful in Florida for destroying the Rust mite *Typhloromus oleivorus*, which attacks orange trees. This treatment would therefore be promising for use against Red spider.

* Signoret, *l. c.* (5s.), ii, 1872, p. 40, t. 7, f. 3; Atkinson, in Jl. As Soc. Calc., iv (2), 1886, p.279.

Washing the orange trees with a solution of whale-oil soap (1 lb of soap to 5 gallons of water) has also been found useful against the rust mite, it is therefore suggested for Red spider, in case the sulphur treatment is not found to be successful.

Through the Officiating Director of Agriculture in Assam were received, in the latter part of August last, (1) specimens of a caterpillar which had proved destructive to castor-oil plants, (2) specimens of Eri silk-worms (*Attacus ricini*) which had died of disease which had been very fatal to them in Cachar.

The caterpillar proved to be the larvæ of the Noctues moth, *Achæa melicerte* of Drury, a species which has previously been reported as destructive to castor-oil plants in Lower Bengal and in Madras (*vide* vol. I, pp. 52 and 104 of these *Notes*). The insect is a common one and occurs in India, Ceylon, Celebes, and Australia.

Millions of these caterpillars are described as emerging from the jungle in one night and eating up acres of castor-oil plants, grown for the feeding of silk worms.

The following extract from the Annual Report, 1888-89, of the Bhadgaon Experimental Farm has been furnished by the Revenue and Agricultural Department of the Government of India :—

"In pursuance of Government Resolution No. 6093, dated 9th September 1887, Revenue Department, experiments were made to test the efficacy of $C.S._2$ as a preservative of grain from the attack of weevils, and upon which a separate report was submitted in August last. The observations were continued this year.

"A summary of the results of the experiments is given below :—

(*a*) That soft varieties of grains such as soft wheats and jowari are sooner attacked with weevils than hard varieties, as *bansi* wheat, *bajri*, &c.

(*b*) That $C.S._2$ is a perfect preservative against the attack of weevils upon grain.

(*c*) The action of $C.S._2$ lasts in cases not hermetically closed six weeks, after which period a fresh charge of the reagent is required.

(*d*) That even in samples which have been attacked with weevils the effect of $C.S._2$ is immediately felt, the weevils disappearing *en masse*.

(*e*) That $C.S._2$ does no harm to grain as regards its colour, smell, and cooking properties, &c.

(*f*) That the poisonous property of $C.S._2$ need in no way interfere with it introduction into Indian villages, as, unlike arsenic, its strong and repugnant smell will act as a sufficient safeguard.

(*g*) With the dismantling of the old granary, which had been used as a store-house for grain for the last nineteen years, weevils have almost disappeared from the farm. After a long and diligent search, I succeeded in observing only a few under the heaps of jowari ears in the threshing yard, so late as the 20th of the last month. This proves beyond doubt that wheat is damaged most by weevils in city godowns, where a large quantity of it is stored every year before being shipped to Europe.

(*h*) It is therefore fair to conclude that painting the interior of the godowns with poisonous paints and charging the grain with $C.S._2$ (in the proportion of 1½ lb of the reagent to a ton of grain) will reduce the damage caused by weevils to wheat and other grains to a considerable extent.

In a letter, dated 13th July, Mr. E. Green of Ceylon wrote :—

"The larva mines below the cuticle of the upper surface of tea leaves. I do not know that the pest is of any real importance, as it only attacks leaves too old for plucking. The habits of the larva are interesting, however. From its being laterally compressed, it accordingly rests upon its side beneath the cuticle of the leaf. It feeds very rapidly, clearing a space more than twice its own size in half an hour's time,—the head and anterior segments moving in regular sweeping curves like a mower with a scythe. Before pupating, the larva assume the usual horizontal position, so that the preparium rests upon its abdominal surface."

The specimen was submitted to M. Bigot, who determined it as a Dipterous insect (Fam. Muscidæ) belonging to a hitherto undescribed species of the genus *Oscinis*.

Specimens of the Hesperid butterfly, *Gangara thyrsis*, Fabr., have been received through the Director of the Forest School, Dehra, from the District Forest Officer, North Malabar, who reports that the caterpillar is very destructive to young coconut palms. The following is extracted from his report :—

"The egg, which is spherical in shape, is laid on the upper surface of the frond. The larvæ appear in from 8 to 10 days, and immediately draw a section of the leaf together, first cutting it laterally to enable it to be drawn into a cylinder by means of fine silken thread. In this cylinder the larvæ live, travelling out at night to feed.

"In appearance the larvæ somewhat resemble that of *Attacus atlas*, but are, of course, very much smaller. They are covered with white filaments which appear as if powdered with flour. There are two patches of scarlet on the segments near the head placed laterally."

Mr. E. E. Green furnishes the following notes regarding the identification of the species described in the paper by the late Mr. Nietner on coffee pests in Ceylon :—

Orgyia ceylonica, Nietner, is probably synonymous with *Orgyia postica* of Moore, the larvæ of the latter often occurring in large numbers upon coffee trees :

Trichia exigua of Nietner corresponds to *Somena irrorata*, Moore, or *Somena scintillans*, Walker :

Agrotis segetum of Nietner is probably either *Agrotis conspurcata*, Walker, or *Agrotis suffusa*, Fabr.; the true *Agrotis segetum* not having been observed in Ceylon ;

Boarmia ceylanicaria is probably *Boarmia*, Walker; biffusaria, while the identity of *Glleriomorpha lichenoides* has, it is feared, been completely lost.

It is much to be regretted that representatives of the various coffee pests that were described by the late Mr. Nietner were not deposited at the time in some local museum where they could be examined and their identification settled. It is hoped, however, that as specimens and information accumulate in the Indian Museum, it will be possible to determine and to publish accurate figures of at least the more important of the insects described by Mr. Nietner.

From Messrs. Mitchell, Reid & Co., of Calcutta, were received, on 29th June 1889, specimens of a scale insect determined by Mr. E. T. Atkinson as *Lecanium theæ*. Messrs. Mitchell, Reid & Co. wrote :—

"We have received from our Holta Tea Garden in the Kangra Valley, some prunings from a tea-bush showing a species of blight, which, our manager advises us, has made its appearance and threatens to spread. The manager says it was first noticed in a garden which largely used castor cake for manure, and he expresses his opinion that the blight resembles that which affected and ultimately ruined the coffee industry in Ceylon . . . . The prunings, which we send herewith, show the blight referred to."

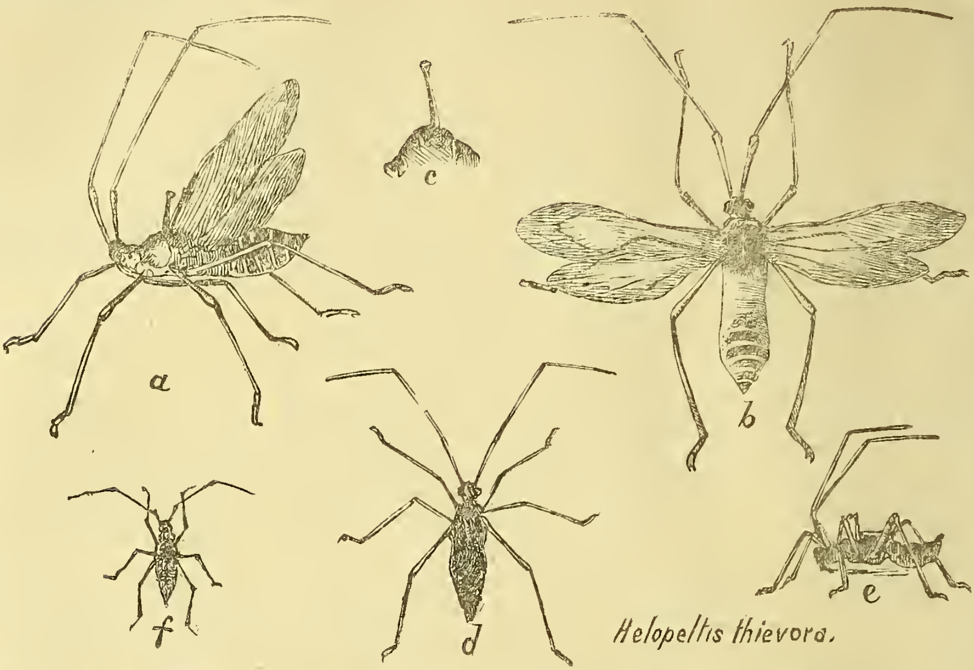
On 3rd July Messrs. Mitchell, Reid & Co. again wrote :—

"In a letter received from the manager this morning he informs us that the pest is distinctly spreading, though in a most irregular manner. Healthy and weak bushes are alike attacked ; a few bushes may be attacked in the middle of a plot in the valley and the pest not appear again for miles, while some gardens have it in a much more aggravated form."

This insect belongs to the same genus as the well-known Coffee scale of South India and Ceylon, and there is little doubt but that it can be destroyed by the kerosine and soap solution recommended for destroying that insect.

We have thus extracted matter locally interesting ; but all tea planters, we repeat, ought to secure copies of the number we are noticing for the sake of the plates, which includes no fewer than 13 pictures of the insects and their parts, prominence being

given to the horn-like spine which rises from the head of that most deadly of all tea pests, the *Helopeltis*. Our engraving—executed by Messrs. H. W. Cave & Co.—fairly reproduces the characteristics of this deadly insect.



a—b.—Imago × 4; *c.*—Scutellar horn × 6; *d—e.*—Pupa × 4; *f.*—Larva × 4.

NUTMEGS IN GRENADA.—A West Indian planter in ordering the *Tropical Agriculturist* and offering to send us an occasional letter—an offer we gladly accept—adds:—"The staple on this estate is nutmegs, and we have lots of trees from 70 to 80 years of age, fine sturdy old fellows which bear enormously and look 'good' for another century."

PLASTER.—A new process of hardening plaster, so as to make it available for the construction of floors in place of wood, has been brought before the French Academy of Science by M. Juite. A mixture of six parts of plaster of good quality and one part of finely sifted recently slaked white lime is employed like ordinary plaster. After it has become thoroughly dry, the object manufactured from it is saturated with a solution of any sulphate, &c., whatever, whose base is precipitated in an insoluble form by lime. The sulphates specially recommended for the purpose are those of iron and zinc. In order to obtain the maximum of hardness and tenacity, it is necessary to temper the lime plaster well in as brief a space of time as possible, and with no more water than is strictly necessary.—*Indian Agriculturist.*

UVA PLANTING COMPANIES.—We have received copies of the Reports of the Spring Valley and Uva Coffee Companies Limited, details of which will be found on p. 201. Meantime we may mention that besides spending money on tea planting and Factory machinery, the Uva Company declares a dividend equal to 2 per cent per annum. The Company has 927 acres under tea and 270 more are to be planted this year, while 942 acres will then be left under coffee. The prospects for both coffee and tea are satisfactory.—The Spring Valley Company is able to declare a dividend of 4 per cent notwithstanding the falling-off in coffee and extensions in tea. Of the latter, 671 acres are planted and 108 acres to be done this year leaving 826 acres still under coffee.

HOW TO INFUSE AND DRINK TEA.—One who knows writes:—"The Norwegian tea cans (sold for a trifle in Vienna) should be sold by millions to the British working men: they keep tea piping hot for quite 3 hours." Specimens should be got from Vienna for inspection by the Ceylon Tea Fund Committee and then if approved of, the advantage of such tea cans could be "officially" proclaimed in England and especially in America where the new Company would only be too glad of a novelty of the kind to accompany their crusade in favour of Ceylon tea.

TEA BOXES.—During a conversation latterly held by me with a member of the Stanley-Wrightson Syndicate it was mentioned that it is not only tea planters that are patronizing the boxes made by it. The soap manufacturers and other traders requiring packing boxes have shown a great interest in the progress of the new undertaking and are likely to aid it extensively. Until the raw material is produced in this country, however, the extension of the manufacture must certainly be delayed. The prices hitherto charged for the tea boxes sent out to India and Ceylon have been below the absolute cost of making them. It is the heavy duty charged on the strawboard exported from Holland that handicaps the Syndicate at the present time. But once let the supply of board become reliable and cheap, and the capacity for manufacture may be extended almost indefinitely. There is one detail as to the making of the chests which at present creates some difficulty. The strawboard is so tough that the ordinary punches break in many cases where they have to be driven through two or three thicknesses of it. A tool which shall partly screw and partly punch seems to be a necessity for working in this particular material.—*London Cor.*

THE COLONIAL COLLEGE AND TRAINING FARMS.

[The institutions referred to in the following report are so important and calculated to be so useful, that we feel bound to lay the details before our readers. Young men passing successfully through the College and Training Farm, will be well equipped for the battle of life in the Colonies, which they cannot help benefiting while benefiting themselves.—ED. *T. A.*]

Lord Knutsford, Secretary of State for the Colonies, distributed the prizes at the college, Hollesley Bay, Suffolk, on Wednesday. A large company was present, among the most prominent being Sir Graham Berry, Sir F. Napier Broome, Sir Rawson Rawson, Sir Arthur Hodgson, Sir Augustus Adderley, Sir Frederick Young, Mr. Braddon (Agent-General for Tasmania), the Hon. A J. Clarke, Lord John Hervey, Hon. Lionel Holland, Mr. Landale, Mr. W. N. Wallor, Mr. Abraham Scott, Major Craigie, Mr. C. S Read, General Montagu, General Lowry, Major Barnardiston, Major Howey, Major Windham, Captain Stirling, Captain Hope, Captain Bougbey Burgess, Mr. Hunter Rodwell, Q.C., Mr. Tylston Hodgson, Mr. T. Holmes, Mr. Frank Garrett, Mr. F. Dutton, Mr. F. M. Dutton, Mr. Percy Borrett, Mr. Duncan Thomson, Mr. E. K. Blyth, Mr. Charles Burrell, Mr. Stancomb Dunn, Mr. Seth-Smith, Mr. Anley, Mr. Rutherford, Mr. Francis B. Baker, Mr. R. Butler, Mr. H J. W. Jervis, Rev. R. Lawrance, Rev. J. A. Clowes, Rev. A. S. Morse, Rev. J. F. Hervey, Dr. Eager, Mr. J. R. Wood, Mr. O'Halloran (Secretary to Royal Colonial Institute), Mr. C. R. Steward, Mr. G. H. Garrett, Mr. David Johnson, Captain Moor, Mr. John Sherwood, and Mr. Robert Bond. Letters were read from the following gentlemen who had accepted invitations, expressing regret at being prevented from attending :—The Marquis of Bristol, Sir Charles Nicholson, Sir Saul Samuel, Sir Charles Mills, Sir Frederick Weld, Sir F. Dillon Bell, and Sir G. Baden-Powell.

The college is situated on Hollesley Bay, about two and a half hours distant from London. The estate contains about 1,330 acres of pasture, arable, heath, and woods, the college in addition hiring and farming 500 acres of fine arable and pasture land adjoining. On the estate there are 1,600 sheep, mostly of the pure Suffolk breed, 100 bullocks, 50 cows, and 60 horses. The institution, which was established in January, 1887, is intended to provide the intending colonist with suitable training, with advice as to his future career, and so far as possible with an introduction to it. A course of instruction is provided in field cultivation, the making and repair of agricultural implements, gardening, bee culture, forestry, tree planting, the care of horses, bullocks, sheep, swine, and poultry, veterinary practice, riding, land surveying and levelling, engineers' and smiths' work, carpentry, and ambulance work. At present there are about 70 pupils under instruction.

After luncheon in the dining hall the company proceeded to make an inspection of the college, gardens, and workshops. At the distribution of prizes which afterwards took place, Lord Knutsford took the chair.

Mr. JOHNSON (the resident director of the college) said that the class work of the college was of a practical character. It was important for young men intended for colonial life to know the reasons why a thing was done and how to do it, and it was a great gain to approach one's work with an enlightened mind instead of approaching it in the dark. The object of the system followed at the college was to turn out good all-round men who should not only be a credit to the college, but whom the college would be glad to recommend afterwards. Their object was to familiarize the pupils with all the circumstances of rural life, whether at home or in the colonies.

The following prizes were then presented by the chairman :—General farm work, L. H. Parker ; ploughing, H. A. Wells ; dairy work, H. A. Wells ; veterinary work, R. B. Baron and M. Deans ; surveying, G. Honywood; levelling, T. Rutherfurd; carpentry, A. E. Fichardt ; smith's work, G. Honywood ; smith's work

and carpentry (combined), G. Honywood ; best collection of grasses, T. Rutherfurd ; gardening, E. N. Howard.

Lord KNUTSFORD, in addressing the students, said that it had given him great pleasure to be able to come to the college that day and to exchange the rather heavy, and perhaps official, air of the Colonial Office for the breezy and much fresher air of the Colonial College. He was very glad to be present, not only to show his own personal interest as Colonial Secretary, but to assure them of the interest which her Majesty's Government felt in the institution and in the increasingly good work of this kind. (Cheers.) It had been very pleasant to him to present the prizes to those who had earned them by hard work. At the same time that pleasure was somewhat diminished by the fact of being called upon to say a few words of advice. It had been said that the giving of advice was a privilege which was very often exercised by one to say foolish things under the pretence of preventing other people from doing foolish things. But he appeared before them without that pretence, because he believed that, in going to cast in their lot with the colonies, the students were doing a remarkably wise thing They were aware that there was no royal road to success ; but there was a royal road against defeat, and that was by perseverance and good work. (Cheers.) He had seen a warning given by some one to emigrants who were going out to other countries without any practical knowledge, without previous training, without studying the climate, the local habits, and the customs of the colonies, and the warning was couched in these words :—"If you are going out unprepared to fight a wilderness—a mighty, tongueless, obdurate, mysterious adversary—he will give you opulence if you conquer him, but a grave if he conquers you." It was a pleasure to him to know that such a warning would be absolutely lost in the case of the students of this college, because they were receiving that practical knowlege with which they would be able to meet the adversary, to secure a victory and not a grave, a competence and happiness if not opulence. (Cheers.) That was the great advantage of the work performed at this institution. In the time of James I, a learned maiden was brought before the King and pointed out to him as a rarity because she could speak Hebrew and Greek. The King immediately turned round and asked, "Can she spin?" (Laughter)—in other words, he did not depreciate the Hebrew and the Greek but he wanted to know whether she was fitted for the work she had to do in life. (Cheers.) The students of this college gained practical knowledge by a variety of instruction, this instruction including a knowledge of ambulance work. That might possibly be, next to the shoeing of horses, the most useful work they would have to do, because many of them would be stationed in the colonies far away from medical assistance, and therefore they would be enabled by this instruction not only to help themselves, but others as well. (Cheers.) It had been hinted to him that he should give the students some advice about the colonies. Frankly, he could not assist them in that respect. The only two colonies he had seen were Malta and Heligoland (laughter), and therefore his knowledge was likely to be still further reduced, because they were just parting with the last-named possession.* He was afraid that he could only speak of the colonies as an old writer, Fuller, spoke of the shires of England—"Some of them," he said, "Joseph-like, have a better coloured coat than others ; others, like Benjamin, have a more beautiful mess of meat." (Laughter.) In other words, some of the colonies are very good for agriculture and crops ; others are better for cattle and ranches. On a previous occasion Lord Lorne, in addressing the students of that institution, advised them to take work in the colonies, but as a general rule to look around them before they began working on their own account. He

* The time may come when practical knowledge of the colonies will be deemed as much a qualification for the office Lord Knutsford holds, as the practical knowledge imparted at this college is deesmed essential to the success of a colonial career.—ED. *T. A.*

felt that to be sound advice. One of the characters in one of Trollope's novels, on being asked how he got on, replied, "Dogged does it," and he gave the students the advice "Be dogged." They would have misfortunes to contend with. Their crops or their cattle might be destroyed; but they ought not on that account to fold their arms and sit down under the misfortune. Let them, on the contrary, stand up like gallant men and fight so as to recover their losses. (Cheers.) In this respect they had an example before them in this country. If they looked around them they would see how the farmers of this country during a succession of bad years had had to fight gallantly against misfortune, and the students in similar circumstances could not do better than imitate that example. He heartily wished them all success. (Cheers.)

SIR A. HODGSON also addressed the students. He said that he went out to Australia when he was 21 years of age, knowing nothing about agriculture. All that he had learned before this was most unwillingly learned as an Eton boy studying Virgil. (Laughter.) Afterwards he entered the Navy, and then went to Cambridge, going ultimately to Australia. He had enjoyed no advantages similar to those now enjoyed by the students of this college, and he impressed upon them to take advantage of this great and golden opportunity to learn. He urged them when they went to a colony not to shift their ground without good and sufficient reason, to stick to the man with whom they might be for the time engaged, to study his character. In the long run their good sense, good feeling, good character, and sound education would stand them well in the hour of difficulty. (Cheers.)

SIR GRAHAM BERRY also thought that young men entering colonial life from the preparation of such an institution as this possessed a great advantage over their predecessors of the olden times. He urged the students who might go to the colonies to be brave, firm, persevering, resting assured that success would be their reward.

SIR F. NAPIER BROOME said that his latter days as Governor of Western Australia had been everything he desired, because he saw that his colony was on the point of obtaining everything it wanted. The Constitution Bill, as soon as it had received the assent of the House of Lords and her Majesty, would allow the colony to enter on a career of free institutions enabling it to take a place side by side with the other great colonies. Western Australia was a new colony, and there was plenty of room in it, and as an old practical colonist he thought that some of the pupils of this college might do worse than turn their attention at this juncture to it, especially when the colony might be said to be starting on a new career. He thought that in Western Australia they could start on a smaller amount of capital than in the larger colonies. A young man with £2,000 could begin his career as a squatter or pastoral farmer. On behalf of the colonies he expressed their great obligations to the Colonial Secretary. (Cheers.) If the Western Australia Constitution Bill had not been handled with great tact and judgment and with great consideration for colonial interests and the guardianship of Imperial interests, it would have been a much more delicate matter to overcome the opposition which a short time ago existed throughout the country.* Almost the whole of the Press was more or less opposed to the Bill giving control of the lands, but now, owing to the way in which the measure had been handled, there was no voice raised against it at the present moment. The chief credit for this was due to Lord Knutsford, and he knew that this feeling was felt in the Australian colonies. (Cheers.) The colony was also very sensible of the support which it had received from the Agent-General of Victoria and the representatives of the other colonies, and who had backed it up so well. Hundreds of young men had come to him with letters of introduction, but on inquiry he found that they knew nothing of practical affairs concerning agriculture, their thoughts being in the direction of obtaining some small post in the Government. (Laughter.) Any one, however, who arrived in the colony having passed through such an institution as this possessed a market value the moment he landed, and his future was assured. (Cheers.)

Sir F. YOUNG also spoke a few words of enouragement.

Mr. BRADDON (Agent-General for Tasmania) bore testimony as a colonist to the immense advantage which students derived from such a college. He advised students to go to some British possession rather than throw in their lot with those who were not of their own race and blood.

A vote of thanks to the chairman brought this part of the proceedings to a close. The company afterwards inspected the farms, dairy, cattle, and sheep. —London *Times*, July 18th.

* The objection to handing over one million square miles of territory, even though much of it is sterile, to 46,000 persons was certainly natural, and the concession required to be carefully safeguarded.—ED *T. A.*

TEA FOR PERSIA.

From an official report on the trade of Khorassan for the year 1889-90, we note that the total value of British goods imported there during the year *via* Trebizond and Tabriz was about 82,000 tumans (23,429*l.*), and of British goods, *via* Bander Abbas, 213,050 tumans (60,871*l.*). This last total does not include the value of China tea, the larger proportion of which should, however, be fairly included, as there is no doubt that most of it was purchased and brought from China by English merchants. No less than 118,571*l.* worth of China green tea and 5,143*l.* worth of China black tea came from Bombay, while the value of the India green tea was only 7,143*l.*, and of the Indian black tea, which is universally drunk in Khorassan, 112,000*l* Thus the total value of China tea was 123,714*l.*, against 19,143*l.* of Indan. A Peshawar tea merchant, just arrived at Meshed to arrange to forward his goods by that route in future, states that the Amir of Afghanistan levies 80 Indian rupees (5*l.* 13s. 4d.) on every camel-load of goods passing through his territory (*via* Kabul) to Bokhara. The Amir of Bokhara also levies 2½ per cent. He further states that a pound of tea, costing 12 annas in India, will cost about 16 annas when it reaches Meshed, 18 annas when it reaches Bokhara by this route, and 21 annas by the Kabul route. He says two-thirds of the green tea imported into Bokhara is Chinese, and one-third Indian. If this is so, a great quantity of Indian tea must travel there by Kabul, the most expensive route, and the Indian merchants must be unaware that the Persian route is the cheapest.—*Grocer.*

TEA IN JAPAN.

Researches on the Manufacture of Various Kinds of Tea. Bulletin of the Imperial College of Agriculture and Dendrology. By Y. Kozai, Assistant in the Agricultural Chemical Laboratory. (Tokio, 1890.)

Y. Kozai is a Japanese chemist who performed his researches under the control of Dr. Kellner, the Director of the Chemical Laboratory at Tokio. His paper includes the chemical constitution of tea, the effect of tea on mankind, the principal methods of manufacture employed in Japan, and the methods of preparing tea for consumption. These subjects are all treated mainly from the point of view of the analytic chemist. The author appears fairly well acquainted with what the German chemists have done in the matter of tea.

We need not abstract much of his account of the constitution and properties of tea, as it is largely taken from European sources. "The chief action of tea, after it has got into the blood, is to excite the nervous system; it thus harmonizes the mind, drives out drowsiness, and awakens thought, stops hunger, and cures repletion, refreshes the body, and prevents head-ache" —and (it might be added) if taken too strong keeps you awake half the night. As to its constitution, tea

contains (besides the common plant-constituents) theine, a volatile oil, and tannin. Theine is a rank poison, in toxic doses causing convulsions and paralysis, in lethl dosesa death; but in small quantities is (like strychnine) a delicate tonic. Of the volatile oil, Y. Kozai can affirm little beyond its well-known exciting action upon the organs of taste and smell; nor is it easy to follow it analytically through the processes of manufacture; the hot steaming employed (at near boiling temperature) in the green-tea manufacture does not appear to diminish the volatile oil sensibly, though Y. Kozai intimates that preparing green tea by boiling does dissipate the aroma. As to the properties of tannin, it is an astringent remarkable for its strong affinity for the albuminoids; hence, if taken in excess, it may, by precipitating the ferments of the digestive fluids, cause indigestion.

The account of the chief Japanese methods of manufacture is of more interest and instruction to the European planter.

We may premise that there are two (main) kinds of tea, viz. black and green. In the manufacture of black tea there are four essential processes, viz. (1) withering; (2) rolling, (3) fermenting, (4) drying. In the manufacture of green tea, the fermenting is omitted, and in Japan (for some kinds of green) the rolling also.

For the manufacture of black tea there is no real difference between the Japanese method and that practised by English planters in Bengal. The fresh picked leaf (*i.e.* tips of the young shoots) must be first withered, or the petioles and leaves break under the rolling; the exposure of an hour or two in strong sun withers the leaf sufficiently; if there is no sun, the leaf must be withered by the aid of fire-heat. The rolling is done, even in Japan, by the aid usually of a box, and in Bengal often by steampower (and very roughly). The juices are thus expressed, and the leaf given a "nice" twist, *i.e.* a twist pleasing to the fancy of the tea purchaser. What perhaps renders rolling so essential in the manufacture of black tea (for it is not essential in the manufacture of green), is that it masses the leaf in a state conducing *without delay* to fermentation. Neither Y. Kozai nor the best Bengal authorities like to lose the juices more than can be helped. He also hazards the view that, by rolling, the juice is expressed from the cellular tissues of the leaves and impregnated upon their surface; thus is produced fine aroma, and the leaves are more easily infused. Fermentation is the most important point in the manufacture of black tea, and by it (*fide* Y. Kozai) the leaves lose their raw smell, and the tea acquires its fine flavour. The fermentation is really only carried a very little way: Y. Kozai says it should be allowed, in a temperature of 104° F., to proceed only for about an hour. He thinks the process is a true fermentation, because if permitted to run too far the tea acquires an acid taste. He thinks it probable that the ferment is caused by a living organism, but he adduces very slight ground for this opinion; and it has, in fact, been questioned whether there is any true fermentation in the process at all. But the English tea-makers are agreed with the Japanese in the importance of stopping the fermentation exactly at the proper point by drying the tea, which is usually done by placing it first in the sun and turning it over till it is fairly dry, and then thoroughly drying it by fire-heat.

The result of all the Bengal experience is that the black tea is at least as good when these four processes are done simply and rapidly, as when much labour and time are expended in complicating them. In the early days of tea manufacture by Anglo-Indians, great pains were taken to imitate with tedious minuteness the careful hand-processes (and repetitions of portions of the processes) as practised in China; but all planters now follow rapid short cuts to the finished tea.

The manufacture of green tea is nothing more than drying the leaf; it is so little practised in British India as to be of no commercial interest there, but Y. Kozai describes in detail three kinds of green tea manufactured in Japan.

(1) *Japanese* (not China) *green tea.* In this, the leaf is steamed in order to remove the raw flavour; it is then rolled and fire-dried, the two last processes being usually done together.

(2) *Chinese green tea.* In this, the leaf is roasted (while stirred with a stick) in an iron pan over a fire, then rolled a little, then roasted again; these processess being repeated even six or eight times, and the tea is then finally dried off.

(3) *Flat tea,* the highest class tea of all. For this tea, the shrubs are usually kept shaded for three weeks before picking, so that the leaf is partly etiolated. The choicest leaves are selected before the manufacture is commenced. They are steamed, but never rolled; nor, indeed, touched by hand at all, but carefully turned by the aid of a bamboo stick, After sufficient steaming they are simply dried.

The author finds by analysis that there is 30 per cent. more theine in etiolated leaves than in the leaves of the same plants grown in the light. He tried many experiments to test the chemical effect of the manufacturing processes. Among other tables given by him is the following; a quantity of leaf was divided into three portions, whereof one portion is A, another portion is manufactured into green tea B, the third portion is manufactured into black tea C. Y. Kozai analyzses A, B, C, and finds—

	A.	B.	C.
Crude protein ...	37·33	37·43	38·90
Crude fibre	10·44	10·06	10·07
Ethereal extract	6·49	5·52	5·82
Other nitrogen-free extract	27·86	31 43	35·39
Ash	4·97	4 92	4 93
Theine	3·30	3·20	3·30
Tannin	12·91	10 64	4·89

He remarks that the general result of the green-tea manufacture is merely to dry the leaf; the black-tea manufacture alters materially its chemical constitution. The principal change is the remarkable diminution of the tannin. He does not explain how this is brought about, nor is it easy to see how the incipient fermentation should affect the tannin.

The only teas exported to Europe from Japan are of low class; they are frequently "faced," and sometimes mixed with the leaves of various Japanese plants. Any plentiful leaf, not too unlike the leaf of tea, will do for this adulteration; the leaves actually employed are (Y. Kozai assures us) all harmless, and several contain tannin, but none of them any theine. As to the "facing," he says it can hardly be called adulteration; the quantity of Prussian blue employed to improve the appearance of green tea is (according to Y. Kozai) about 0·001 per cent. the weight of the tea, perfectly innocent, and pleasing to a purchaser.

The author concludes with an account of the different ways of taking tea in Japan, with some analyses of the prepared liquor.

(1) In the case of flat tea, or of the very finest quality of Japanese green tea, the tea is ground to fine powder, and the whole infusion drunk.

(2) In the case of superior (*i.e.* from the Japan point of view) tea, the leaves are infused for two minutes in water at 120°–150° F.

(3) In the case of a medium tea, the leaves are infused for one minute in boiling water.

(4) In the case of inferior tea, the leaves are boiled in water.

The object to be aimed at in the preparation is to get the largest possible quantity of theine without dissipating the aroma, and accompanied by only a moderate amount of tannin. Y. Kozai gives analyses to show that this is effected (in the case of superior teas) by the infusion in water at 120°–150° F. for two to five minutes. By superior teas, he understands teas worth five to seven shillings a pound in Japan. It is probable, therefore, that the highest class teas we ever have to deal with in England come under the medium teas of Y. Kozai, which require infusion in boiling water—for one minute at least. The majority of English people like a good deal of chicory with their coffee, and probably a majority also like a good deal of tannin with their tea; and to them

the analyses and recommendations of the Japanese writer are of small importance.

The paper will be of more use as food for reflection to the Anglo-Indian planter than as direct instruction. The palate of the Englishman is as yet only very roughly educated in tea. There can be very few Englishmen who would greatly prefer the superior tea of Japan and China to the ordinary Kumaon or Ceylon tea; most persons used to drinking the latter would probably prefer it to the most expensive tea made—say China tea worth forty shillings per pound in China. The English planter in Bengal has a tea-garden of 200 acres (possibly still larger). His object is, by the aid of a steam-engine or other coarse help, to put his tea through—to keep his factory clear when he has a strong flush on. He has to carry the daily make through by the aid of uncivilized labourers and overseers. He must reduce every step of his manufacture to a routine; he must have no special tea separately and differently manufactured, and no current experiments. Few planters have made much profit by Pekoe; and the green tea hardly exists commercially in India. There are no doubt many Englishmen who, having not a plantation but (literally) a garden with some tea in it in India, have manufactured, not unsuccessfully so far as the flavour of the tea is concerned, green tea, Pekoe; &c., but this has been a fancy article for their own drinking or for presents, and has never been put in any quantity on the market. To plant successfully in India, the Englishman has to proceed on a broad scale; his large cost and high expected profit cannot be got out of the close superintendence of elaborate hand manufacture. Or, at least, it will be a long time before the public tea taste at home is sufficiently elevated to be willing to pay so large a price for such teas as would remunerate the English planter. For the present, the object of the planter must be to produce the maximum quantity of tea that the English grocer can sell at 1*s.* 6*d.* to 2*s.* 6*d.* a pound. Hence to planters the utility of the paper of Y. Kozai must be mainly future.—*Nature.*

CONCERNING COCOA.

Cacao seeds, or cacao beans, or "cocoa nibs" as they are commonly known in the trade, are the fruit of the cacao tree, They grow in large fleshy rotund pods. The cacao tree belongs to the natural order of the *Stercularia*, and its botanical name is *Theobroma cacao.* This name was assigned to it by Linnæus, the great botanist, as an indication of the high appreciation in which he held the beverage prepared from the seeds. The word theobroma really means "food fit for the gods." There are nearly a dozen varieties of the cacao tree, and these flourish in the West Indies chiefly, but are also cultivated and grow wild in the northern part of South America, and in Central America north as far as Mexico. The best kind is indigenous to Venezuela, and the cocoa which it produces is known as Caracas; that which comes from Trinidad perhaps ranks next in quality. The cacao tree is being cultivated in various other parts of the world, wherever the climate is found suitable, for there is an ever-increasing demand for the "nibs" on the European markets. History relates that the seed of *Theobroma cacao* were first described by no less a personage than Captain Gonzalo Fernandez de Oviedo y Valdés. About the middle of the sixteenth century he writes that Columbus found the natives of Yucatan using these seeds as money, just as some of the aborigines of Africa use cowrie shells. In those times the Spaniards were rapidly extending their conquests and colonies in the New World, having received *carte blanche* from Pope Alexander VI., who issued a bull granting all east of a line one hundred leagues west of the Azores to Portugal, and all west of this imaginary line to Spain! In Spanish literature of the latter part of the sixteenth century there are frequent references to the uses of the cacao seeds.

Cacao seeds are very rich in oil: in the shelled state they yield nearly 50 per cent. of a thick buttery oil, which is known in trade as cacao butter. At ordinary temperatures this oil is nearly solid, in fact is much like soap in consistency and general appearance. The average composition of cacao seeds, according to Wanklyn's analysis, is shown by the following percentages:—Fat or cacao butter, 50·00; albumen, fibrin, and gluten, 18·00; starch, 10·00; gummy and mucilaginous matters, 8·00; colouring matters, 2·60; water, 6·00; theobromine, 1·50; ash, 3·60; loss, &c., 0·30: total, 100·00. The husk of the seed is usually stripped off before exportation; it is composed of three distinct layers or membranes. By means of the microscope the outer layer is seen to consist largely of elongated cells, the middle layer consist of angular cells containing mucilaginous matter, whilst the inner layer is a mere membrane or pellicle, and is composed of angular cells which contain oil. The starch is located in the seed proper, or "nib," which is built up of small cells distended with grains of starch: delicate reagents will detect traces of inulin in these tissues. Wanklyn's averages put the percentage of theobromine rather high, and he must have examined a number of exceptionally fine samples; other observers state that the seeds only contain about 0·5 per cent. of theobromine, and doubtless their results are not wrong, but have been compiled from the examinations of different varieties of cacao. It is wonderful what a difference slight variations in the constituents of the soil or in the species of a tree will make in the chemical composition of the crop.

The question naturally arises, What is theobromine? Now, although it exists in such very small proportions (from about one-half to about one and a half per cent.) in the cocoa nib, it must not be supposed therefore that it is insignificant; indeed, it is to the presence of this substance that cocoa owes its peculiar properties as a beverage. Theobromine bears to cocoa an analogous relation to that which exists between caffeine (or theine, as it is also called) and tea or coffee. It is a rather remarkable fact that caffeine is very closely connected with theobromine, considered from a chemical point of view, for both these substances belong to what is called the uric acid group of chemical compounds. They only occur in the vegetable kingdom, and were formerly classed amongst the alkaloids, that is, amongst such poisonous substances as strychnine, morphine, &c.; but the recent researches of several well-known scientists have demonstrated that they are both analogous to uric acid and to other similar bodies which exist in the animal organism. These facts seem at first to provide matter for unpleasant reflection, but we must remember that we are only dealing with chemical analogies.

We can represent the composition of theobromine by a formula, that is to say, by "chemical shorthand"—it is $C_7H_8N_4O_2$, which implies that seven atoms of carbon, eight of hydrogen, four of nitrogen, and two of oyxgen have all united together to form this substance. The honour of having discovered theobromine is due to Woskresensky. By extracting the pounded "nibs" with boiling water, precipitating with lead acetate, then treating the clear liquid which remains after filtering with sulphuretted hydrogen, and finally boiling with alcohol, theobromine will separate out from the cooled liquid in the form of beautiful microscopic crystals. These crystals are slightly soluble in cold water, and the solution possesses a curious bitter taste, which becomes preceptible after a time. The bitter principle, of coffee and tea, namely caffeine, is strictly speaking, methyl-theobromine, $C_8H_{10}N_4O_2$. Theobromine has actually been found along with caffeine in the young leaves of the Himalaya tea. Its effects upon the human system are mildly stimulating.

Cocoa, as we understand it nowadays, is the roasted and ground cocoa nib, the husk having been previously removed. Everyone probably knows that although the "nibs" can be obtained whole or broken, most of the cocoa sold is either rock cocoa, flake cocoa, or prepared powdered cocoa. Cocoa is too rich in fat to suit the digestions of the general public, hence many manufacturers eliminate more or less of it. Others incorporate a certain amount of starch

with the ground nibs, thus producing a cheaper article which is not so gross. Chocolate is merely cocoa to which a large quantity of sugar and more or less starch has been added, together often with various flavouring essences. Cocoa really partakes more of the nature of an article of food than of a beverage; it is very rich in warmth-producing and flesh-forming constituents, and in these respects it compares favourably with tea and coffee. The term "soluble cocoa" is a misnomer: it should rather be "miscible cocoa." Anyone can demonstrate this by allowing a cup of cocoa to stand and settle for a few hours. The experiment is best performed in a glass tumbler.

The mixture of cocoa are now made chiefly with sugar and starch, and these are not regarded as adulterations by the manufacturers who make some of the "prepared cocoas." Venetian red, chicory, cocoa husks, and various flours and ground cereals are sometimes met with in low-grade cocoas; but starch is "the thing," and to provide this the potato, sago, arrowroot, maize, &c., are laid under contribution. Chocolate is made to contain a great deal of sugar, hence sophistication is more easily concealed from the taste. Chevalier states that chocolate is largely adulterated, but that as the public generally understand that it is merely a preparation of cocoa, it does not much matter so long as the added ingredients are wholesome. Still there is no excuse for such substances as the following being present, viz.:—Lime, ground lentils, maize and bean flour, foreign fats and oils, various gums, and such colouring matters as cinnabar, red earth, and even red lead. Most of these sophistications can be detected by the microscope if they be of vegetable origin, and if of mineral origin they can be identified by means of the usual chemical reagents. Wanklyn states that the mineral matters ought never to exceed 5 per cent. He recommends the determination of the phosphoric acid in the ash as a means of detecting the adulteration. Fat is best estimated by extraction with ether.—*Grocer.*

NOTES ON POPULAR SCIENCE.

By Dr. J.E. Taylor, F. L. S., F. G. S., &c., Editor of "Science Gossip," &c.

Whilst on the subject of chemical experiments and investigations of a practical character, I should do well to notice those on the physiological value of what may be termed "commercial foods," such as the different kinds of oil-cake, &c., in relation to their milk-producing power. The experimental cow received 15 lb. of clover hay and 3lb. of cake per day. It was found that rape-cake produced an increased amount of milk the first day, and the same fact was rocorded when this was exchanged for coconut cake. Indeed, in both cases, the increase was very considerable, but that produced by coconut cake lasted much the longer. In other experiments, in which 20lb. of green fodder was given per day, an addition of 3lb. of linseed cako gave an increase of 12 per cent. of milk. The same weight of coconut cake raised the yield to 11 per cent, but lasted longer. Hemp-cake had no effect at all. The increase of milk was also produced by giving the cow (in addition to its green food) sun-flower cake, poppy-seed cake, coconut cake, &c.; the yield of milk being most increasod by tho last, and least by the sun-flower seed cake.*

For several years past I have been suspicious about the use of nitrate of soda. Many farmers don't know what to do with it when they have purchased it—and it is rather an expensivo article. Artificial manures want mixing with the same sort of thing that Sir Joshua Reynolds said he mixed his paints with—brains. Then success is sure. I have long been of opinion that an excessive use of nitrogen, whether organic or artificial, tended to promote and encourge the rapid growth and development of such parasitic funguses as moulds, mildews, and rusts. Thus, in the published results of some Rothamsted experiments on the growth of potatoes, I observe that those manured by ammonium salts and soda nitrates, although they yielded splendid crops, had the largest proportions of diseased potatoes. What is the good of producing a diseased crop? A manure of superphosphate of lime, although it only produced an average of three and a half tons of potatoes to the acre had only two and three-quarter hundredweight of these diseased, whereas ammoniun salts and mixed mineral manures, and a mixture of sodium nitrate and other minerals, although they actually produced a heavier crop of Potatoes (nearly six tons in the former instance, and almost approximating to that in the latter), nevertheless yielded eight and a quarter and nine and a quarter hundredweights of diseased tubers respectively. The fact is nitrates of soda, as well as ammonium salts, in nearly every instance ought to be used sparingly (hand sown), and when the crop is just appearing above the ground. Then they are stimulants as well as food for the baby plants.

Notwithstanding my criticism regarding the use and abuse of nitrogenous manures, the above-mentioned Rothamsted experiments distinctly brought out the fact that the use of nitrogenous manure gives rise to a great increase of starch in the potato, just as in the case of root crops there is an increase of sugar under these conditions; and in that of cereals an increase of starch and cellulose. The real cause of the potato disease is the fact that the fungus converts its starch into sugar, and stores up in itself a large proportion of the nitrogenous juices of the potato.

The influence of the electric light upon vegetation has manifested itself in a very remarkable manner in the case of the large lime trees on the Leipziger Platz, Berlin. On the branches of those trees which are opposite the electric light, a few days ago the development of the new leaves had advanced considerably, whereas on the other side, where the light does not strike upon the branches the buds had only just begun to form.

I have frequently referred to the idea of the late Professor Ville, of Vincennes, to the effect that the natural order of plants Leguminosæ have the power directly to fix the nitrogen of the atmosphere. This appears also to be the belief of Sir John Lawcs and Dr. Gilbert, based upon their experiments at Rothamstead. It is further thought this nitrogen-absorbing power is largely brought about by the micro-organisms growing on the roots of the Leguminosæ.

Here is a chance for wealthy young Australians to form a syndicate. M. Daubree, the well-known French geologist, has expressed his opinion that the deeper formation of the earth's crust contain abundance of diamonds. Diamond powder, as I have already shown, has been found in meteorites. Professor Daubree has made observations in all the diamond-bearing regions, and finds the stones occur in the oldest and most deeply-seated rocks. Why not start a company and bore down a mile or so?

Two of our young and rising chemists—Messrs. H. T. Brown and G. H. Morris—have just given to the scientific world the results of a long-continued and most delicately manipulated series of experiments on the germination of some of the grasses. Their investigation was undertaken with the view of throwing some light upon the complex metabolic processes which take place during the germination of seeds. This their first paper on the subject (read before the Chemical Society), is almost confined to barley. Some years ago the great German botanist, Professor Sachs rather startled the botanical world by the statement that in a seed the relation of the embryo to the endosperm is that of parasite and host. Messrs. Brown and Morris's experiments confirm Professor Sachs" generalisation. More, in their experiments, they availed themselves of this suggested relation by cultivating the embryo upon suitable media after separating it from

*This supplies a full and satisfactory answer to our question in discussing cattle disease and cattle feed, as to the suitability of coconut poonac for milch cows.—Ed. *T. A.*

its endosperm. In this manner they obtained special information with regard to the secretory powers of the embryo, and the chemical modifications of its absorbed nutriment, which it woud have been impossible to have obtained by any other means.

As the result of cultivating the excised embryos upon various nutrient solutions, more specially of the carbohydrates, Messrs Brown and Morris showed that while cane sugar, invert sugar, dextrose, lœvulose maltose, raffiose, galactose, and glycerol have all more or less nutrient value, milk sugar and mannitol do not in any way contribute to the growth of the tissue of the young plant. Of all the substances they tried they found cane-sugar had by far the gratest nutritive power. Maltose, although the natural food of the embryo when attached to its endosperm, is decidedly inferior in this respect to cane sugar. This may be due to the fact that the maltose, directly it is absorbed by the growing embryo, becomes transformed into cane-sugar in the living cells, and in this form is passed from cell to cell. When cane-sugar is supplied ready formed to the young plant there is a saving of chemical energy to the living cells, which receive it in a form in which it is directly available for its requirements. The two young experimenters expressed their opinion that the transformed starch of the endosperm is absorbed by the embryo in the form of maltose, and that the seat of production of the cane-sugar which germinated grain contains is the tissues of the embryo itself.

A new green vegetable colouring matter has just been announced by Mr. C. Michie Smith. It has been extracted from the green pulp of the fruits of Trichosanthes palmato, and has thefore been christened trichosanthin. It yields a solution nearly resembling chlorophyll, but possesses a very different spectrum. It is thought that in trichosanthin we have in the colouring matter a substance in which the "blue chlorophyll," of Sorby and the "green chlorophyll" of Professor Stokes are replaced by some other substance easily decomposed by reducing agents and acids.

A new and dangerous parasitic fungus on the vine has just been described by M. Lagerheim to the Paris Academy of Sciences, It is a uredo, and accumulates in dense clusters on the leaves. So far it has only been met with in the neighbourhood of Kingston, Jamaica.

The following fact is worth everybody making a note of. We imagine we have done our duty by the water we drink when we filter it. Now, it has been just demonstrated that when filters (or rather the filter-beds) have been too long in use, they are nothiog better than germ-disease breeding-beds. One of the best and simplest filtering-beds I know of is composed of common cinders. It ought to be taken out and made red hot (or calcined) about once a month. That will destroy anything. Then a fresh and calcined layer of fine saud should be strewn over (if red sand all the better, as the iron will fix decomposing organic matter). I have never had the slightest difficulty with my filters, beyond the trouble involved by treating them as above mentioned; and a man who will not take the trouble to keep his drinking water clean would not take the trouble to keep his face clean.

At length it seems that the frequently talked-of idea of utilising the motive power of Niagara Falls will come into operation and turn the spindles of commerce instead of serving no other end than that of allowing fools to go over in barrels. It is intended to bore a tunnel from the water level below the falls under the high bank of the river, extending through the rock to the upper river at a point about a mile above the falls. There a head of 120 ft. of water can be obtained. The tunnel is thence to extend parallel with the river for a mile and a half at an average depth of 160 ft. below the ground, and about 400 ft. distant from the navigable part of the river. The fall of water thus obtained is estimated to produce 120,000-horse power. Mills will be supplied with the power at some distance from the falls, so that the scenic features of the latter will not be interfered with. —*Australasian*.

INDIAN TEA COMPANIES.

Mr. Ernest Tye, Secretary, Indian Tea Districts Association, has compiled for the *Home and Colonial Mail* a list of the Indian Tea Companies in London, numbering 63. No fewer than 10 of these Companies own such large areas of land as from 3,500 acres in the case of the Tarrapore, Cachar, to no less than 9,185 opposite the Assam Company. There are two Companies below the colossal Assam, with over 8,000 acres, one with 7,000, one with 5,096 and one with 4,715. Of course, with such areas, there can be no scarcity of timber or fuel. Indeed we believe that in many cases the coolies employed have lands on which they cultivate rice,—portions of the areas owned by the Companies being swamps or irrigable.

Out of the 9,326 acres owned by the Assam Company the proportion under the heading of "acreage and mature plants" is 7,520, and the yield per mature acre is given at 356 lb. The cost of producing the tea was 9¾d per lb., and the value in bond, including seed, &c., was 11¼d. The dividend of this Company, which some years ago ranged about 20 per cent, was, for 1889, 10 per cent. The capital per acre is put down at the low sum of £20, due to the fact that the present Company purchased the property at a very small sum in comparison with what it cost the originators of the enterprise, who suffered the fate so common to pioneers. The Land Mortgage Bank of India is in a very different position, owing, no doubt, to loans on estates which had to be taken over. The capital per acre, in this case, is so high as £43, and although a profit of nearly £14,000 resulted from 7,467 acres mature plants, yielding 306 lb. an acre, value 10½d per lb. no dividend was declared. We have next four Companies in succession which divided 10 per cent in the case of three and 12½ per cent for the fourth. The values of tea in these cases ranged from 10d to 11⅝d, while the cost ranged from so low as 7¼d to 10d. The Company which produced its tea at 7¼d got 452 lb. per acre, while the Company which shows the very highest yield per acre in the list, viz. 721 lb., has 8d down as the cost and 11⅝d as the value. This was the Company which divided 12½ per cent. The highest dividend of all, however, 18 per cent, is opposite the Cherra Tea Company, Limited. The capital of this Company is down at £114,500, for an area of 2,836 acres, or £40 per acre. The acreage in bearing is 2,645, from which a crop of 1,389 was gathered, or at the rate of 489 lb. per acre. The cost per lb. was only 6½d and the value 10¼d. It thus appears that the best dividend was not declared by a Company having the highest yield or the teas of which sold at the best price. A cost of production equal to only 6½d per lb. seems low enough, but the next figure for cost of production is only 5½d. But, alas! the tea was of a value only one penny higher, so that the surprise is that even a dividend of 2½ per cent was declared. A Company which produced its teas at 6¾d and sold them for 9¾d, divided 10 per cent. So did another Company although the tea cost 10d and sold for 1·0$\frac{3}{16}$d. Another Company which divided 10 per cent, produced its teas at 7$\frac{5}{16}$d and sold at 10$\frac{11}{16}$d. The Shumshernugger Company gave a dividend of 13 per cent. The capital of this Company is down at £21,000; acreage 812; capital per acre £26; acreage mature plants 677; yield 313,000,

at the rate of 462 lb. per acre. The tea was produced at a cost of only 6d, and sold for only 8¾d. The result, as we have said, was a dividend of 13 per cent, notwithstanding the low price at which the teas sold. The Moabund Company showed a dividend of 15 per cent. Its capital is down at £35,007; acreage 713; capital per acre £49; acreage mature 596; yield 322,000 lb. at the rate of 542 lb. per acre. The tea was produced at 9d and sold for 1/2¾, the very highest value in the list. The Doom Dooma Company divided 14 per cent. The capital of this Company is down at £116,100; acreage 1,671; capital per acre £69; acreage mature 1,403; yield 877,000, a rate per acre of 625 lb. The tea was produced at so low a cost as 7$\frac{13}{16}$d per lb. and sold for 1/0$\frac{7}{16}$d. For the 34 Companies of which the working results for 1889 are given, we get the following details ;—

The paid up capital ranged from £354,644 to £20,000.

The total acreage ranged from 9,326 to 600 acres.

The capital per acre ranged from £154 to £21.

The mature acreage ranged from 7,520 to 510 acres.

The crop of 1889 ranged from 2,674,000 lb. to 143,000 lb.

The yield per mature acre ranged from 721 maximum lb. to 246 lb. minimum.

The cost of tea per lb. ranged from 11½d to 5½d.

Value of tea per lb. in bond (including seed etc.) ranged from 1s 2¾d to 6½d.

We must not omit noticing the generally high bearing rate of the mature acreage. We have already noticed the maximum of 721lb. per acre. Then we have 645, 632, and 625; next come 575, 563, 542, and 515; below 500 but above 400, we get 489, 486, 467, 466, 462, 452, 441, and 427. So that there are 16 companies out of the 34, or nearly one half, the average yield of whose estates is over 400 up to over 700. The number of estates which range below 400 but above 300 lb. are 10, so that 26 out of the 34 companies got average yields above 300 up to over 700. In looking at this yield and comparing it with that of Ceylon estates, it must be remembered that the vast proportion of the Indian tea estates were opened on virgin soil of special richness, there being no old coffee estates, more or less washed and worn, to lower the average. Considering how *our* average yield is affected by the low yield of old coffee estates, we compare fairly well with India; in specially favourable cases, such as that of Mariawatte "beating creation."

The results under the head of dividends for the year show that, of the 34 companies, 1 gave 18 per cent; 1 gave 15; 1 gave 14; 1 gave 13; 1 gave 12½; 7 gave 10 per cent; so that 12 companies, or more than a third of the whole, divided 10 per cent and upwards. We have a dividend of 9 per cent in case of 1 company; 1 gave 8; 1 gave 7; 9 gave 6 per cent; 1 gave 5½; and 1 gave 5. So that 14 companies gave dividends from 5 per cent up to 9; and 26 out of the 34 gave dividends ranging from 5 to 18 per cent. A dividend of 3 per cent is opposite 1 company and 2½ per cent against another.

In the first case, that of the Land Mortgage Bank of India, where no dividend was declared, the profits were nearly £14,000. There were good reasons in this case for not dividing any of the profits, as the losses of previous years had to be made up. In the second case of no dividend, the profits were £11,116. Then comes a case with £748 profits; two others with £1,502 each. The only case of absolute loss, the sum being £2,531 is that of the Endogram Company with £40,000 capital; 1,089 acreage; £36 capital per acre; 1,064 mature acreage; yield 272,000 at the rate of 255 lb., the lowest yield recorded. The tea cost 10½d to produce it and sold for only 8d.

Leaving this exceptional case out of view, the results of the working of the leading Indian Companies seems by no means discouraging, especially in view of the considerable fall in the selling prices of teas compared with those which prevailed a few years ago. Not many planters in Ceylon, we suspect, can beat the Indian record of minimum cost of production, 5½d per lb. But in this direction of economical working, so as to reduce cost of production it is evident we must proceed, if the Ceylon tea enterprise is to continue profitable. Meantime efforts to open up new markets must not slacken.

CATTLE DISEASE IN SOUTHERN INDIA, CEYLON AND THE STRAITS.

While waiting for the disposal "a press of other matter," in order to resume our discussion of the question started by our correspondent "Truth" as to the necessity for stringent measures of quarantine, stamping out and so forth, to combat cattle disease in Ceylon, evidence as strong as it was unexpected has been afforded of the correctness of the views we expressed, by a resolution of the Government of Madras. In this resolution the expenditure for a lengthened period in attempting to carry out measures such as "Truth" demanded and the Ceylon Cattle Commission of 1869 recommended is declared to be money wasted, and the whole machinery for watching and segregating cattle has been abolished. The Government of Madras have come to the conclusion we expressed that stringent measures of repression are impracticable, looking at the circumstances of the country and the character of the people, and that we must look for gradual improvement with advancing intelligence. We deem it quite probable that "Truth" will say: "The action of the Madras Government only renders stringent quarantine and other measures on our part the more necessary." What would better please our pro-bovine friend are the details of very stringent legislation in Perak, following that in force in the Straits Government, whereby quarantine precautions are applied equally to cattle and human beings, power being reserved to "stamp out" the former, with or without compensation. The subject is so interesting and in many aspects so important, that we shall devote another article to its discussion. The misery, of course, is that when rinderpest breaks out amongst the wretched native cattle, badly fed and worse tended, it does not confine its ravages to animals comparatively worthless but destroys valuable imported animals, treated in the most liberal and humane fashion as they may be. The following is from the *Madras Times* of August 5th :—

The fiat lately went forth for the abolition of the Cattle Disease Department in this Presidency. Government was led to take this step, on the report of the Agricultural Committee that the money expended upon attempts to cope with cattle-disease had been practically wasted, and that until the spread of education has effected a change in the attitude of the ryots, it would be wiser to suspend the attempts to directly combat the evil. The Agricultural Committee stated, that "in dealing with diseases which, owing to the customs of cattle-management and the conditions of the country, spread with immense rapidity, and find a victim in every stall, we deem it hopeless for many years, to attempt directly preventive and curative work over the whole area of the country, and we are absolutely convinced, that the present method of placing solitary inspectors, themselves insufficiently educated and trained, in charge of a whole district, with but little supervision and no possible chance of obtaining local influence over so vast an area, is radically wrong. We look forward to a time, when

there will be a highly trained Stock Inspector with a staff of salustry subordinates in every taluk, when the sense of the country will be actively on the side of the preventive and curative staff, and when better stock management will remove the predisposing causes of epidemics. This is not yet within measurable distance, but we consider that the Department should at once bend its efforts, to obtain as quickly as possible a considerably strengthened staff of Stock Inspectors." But the proposal did not meet with the approval of Government, which considered such a policy impracticable, as it would require a whole army of Stock Inspectors and Salustries, and even then but little good would result, in the present state of opinion of the farming classes, unless the former were entrusted with wide and stringent powers of compulsion, which would be an evil to be avoided ; for taking into consideration the classes from which the staff is recruited, their low salaries, and the opportunities they have for oppression, they would gravely abuse the authority entrusted to them. Government also alluded to the fact, that there were doubts whether the effects of disease are so serious as they are represented. Mr. Robertson, for example, is of opinion, that losses of cattle result from the impoverished condition, into which the stock frequently get and not from the severity of the diseases that prevail. From statistics, it is found that cattle mortality from disease is not high, while cases of epidemics, seriously affecting ploughing cattle, or the more valuable animals, are comparatively rare. Government agreed with Mr. Benson, that cattle must die of something, and as very few in this country are slaughtered for food, they wou d multiply far beyond the means of subsistence, if epidemics were stamped out, so that besides further deteriorating in quality, they would die from sheer starvation in as great numbers, as they now do from disease. The efforts of officers of the Cattle Disease Department were further handicapped by the passive and even active obstruction offered by the ryots to all efforts to assist them. With this opposition, religious scruples, apathy and ignorance of the ryots to deal with the Department was utterly useless, unless a very expensive staff was entertained, with summary powers, which was not expedient at present, and would be fraught with great danger to the people. Government therefore come to the conclusion that the amount already spent on the Department had been literally wasted, and it directed operations in this direction to be closed at once.

MAIZE OR INDIAN CORN.—"Old Resident" writes:—"No doubt Sir Arthur Havelock was thinking, when he made his remark at matale, of the almost universal cultivation of maize in south Africa, in contrast with the scarcity of the culture here. But the cause of this you have already explained."

NUTRITIVE VALUE OF FOODS.—Speaking roughly, a quart of oysters contains, on the average, about the same quantity of actual nutritive substance as a quart of milk or a pound of very lean beef, or 1½ pounds of fresh codfish, or two-thirds of a pound of bread. But while the weight of actual nutriment in the different quantities of food material named is very nearly the same, the quality is widely different. That of the very lean meat or codfish consists mostly of what are called, in chemical language, protein compounds, or "flesh formers," the substances of which make blood, muscle, tendon, bone, brain and other nitrogenous tissues. That of the bread contains but little of these, and consists chiefly of starch, with a little fat and other compounds, which serve the body as fuel, and supply it with heat and muscular power. The nutritive substance of oysters contains considerable of both the flesh-forming and more especially heat and force-giving ingredients. Oysters come nearer to milk than almost any other common food; their values for supplying the body with material to build up its parts, repair its wastes, and furnish it with heat and energy, would be pretty nearly the same.—*Century.*

BAMBOOS were sold last year by the Forest Department in Bengal to the number of nearly fifteen millions. As compared with the previous year, there was a falling-off of more than a million in the number of bamboos sold. The decrease was pretty general in all the forest divisions, but occurred chiefly in Chittagong, where the fear of raids kept men from going into the forest.—*Pioneer.*

ARTIFICIAL TEA.—The Calcutta *Capital* for May 20 has the following :—" A new industry has sprung up in Germany with the young leaves of the wild strawberry plant. Having been carefully dried, they are used instead of China tea, and are said to approach that beverage very closely in taste. An addition of young bramble and woodruff leaves is said to add to the excellent flavour of this most inexpensive of teas."—*Grocer.*

SUGAR is cheap enough now, as every sugar-planter knows. But hitherto we have only thought of it as a sweetening agent. Now we are discovering it has other properties, which may tend to raise its market price. An Italian engineer has proved that if sugar be introduced into the water of steam-boilers it will retard (if not prevent) incrustation. In a boiler of 20 horse-power, possessed of 126 tubes, 4lb. of sugar a week was found sufficient to retard incrustation. In Butler's *Erewhon* we have a delightful chapter devoted to the period when our machines will become sensibly automatic, and take the place of supposed rational creatures. The above fact seems to be moving in that direction. Our steam-boilers are getting as fond of sugar as children.—*Australasian.*

ONIONS.—For a cold on the chest there is no better specific for most persons than well boiled or roasted onions. They should be sliced and boiled in milk till soft enough to smash up and form a sort of gruel, Drink or sup just before or after getting into bed. They may not agree with everyone, but to persons with good digestions, they will not only be found to be a most excellent remedy for a cough, and the clogging of the bronchial tubes, which is usually the cause of the cough; but if eaten freely at the outset of a cold, they will usually break up what promised, from the severity of the attack, to have been a serious one. A writer in a medical journal recently recommended the giving of *young* raw onions to children three or four times a week, and when they get too large and strong to be eaten raw then to boil or roast them, but not to abandon their free use. Another writer, advocating their use, says: " During unhealthy seasons when diphtheria and like contagious diseases prevail onions ought to be eaten in the spring of the year at least once a week. Onions are invigorating and prophylactic beyond description. Further I challenge the medical fraternity or any mother to point out a place where children have died from diphtheria or scarletina, ruginosa &c., where onions were freely used."

DISEASES IN PLANTS.—A capital paper appears in the last number of the *Gardener's Chronicle* by Mr. H Marshall Ward, a naturalist who has come rapidly to the front, on the important subject of the diseases of plants, His essay is on chlorosis or "yellows"—that is, the absence of green in leaves, and the substitution of yellow instead. Unfortunately there are several different kinds of chlorosis, but that usually affecting plants is a diseased condition of the leaves, in which the absence of the green colouring matter is due to the deficiency of iron salts in the soil. It should be remembered that leaves affected by chlorosis are incapable of assimilating carbon. It the leaves are young, watering them with a weak solution of iron salts will restore their greenness; although, of course, the best plan is to apply the solution of iron to the roots. There is usually plenty of iron in all soils, but it is in a fixed or stable condition, very little of it being available by the plants in the soluble state. Iron sulphate is, perhaps, the best applicant to the roots of affected plants, inasmuch as it dissolves slowly and yields up its iron in an available condition. Garden or cultivated plants which grow rapidly are much more liable to chlorosis than field and wild plants which grow slowly.—*Australasian.*

CATTLE AND CATTLE DISEASE IN CEYLON.

Our correspondent "Truth" having, apparently, retired from the discussion which he initiated, another writer comes forward with suggestions, some at least of which would be useful, if the combined apathy and stolid prejudice of the people would permit of their being carried out in practice. With the precautions and action now proposed it may be well to compare the recommendations which were the result of the extended enquiry and the voluminous report and evidence of the Commission of 1869. The summary was as follows:—

1. All cattle arriving from India at any port in Ceylon to be subject to a quarantine of fourteen days, which may include the period occupied by the voyage.

If during that time disease breaks out, the animals should be treated as in any infected district. If no sickness appears, license to travel may be issued to the owners.

2. No cattle to be allowed to graze on the Crown pastures about the old Irrigation Works, without license from the Government Agent of the District.

3. No bull more than a year old to be allowed to graze on any public pasture grounds.

4. Castration of cattle to be allowed by European mode alone.

5. Owners of cattle to report any suspected cases of sickness. Headmen to inspect the herd, and if murrain exists to separate the sick animals, and report to the Government Agent of the district.

6. Locality to be declared infected and placed in quarantine, and other cattle not allowed to pass through the same.

7. Restriction to be removed only by order of Government Agent or other superior authority.

8. Hospitals and medicines to be provided for sick cattle, and Keepers appointed.

9. Owners of sick cattle to pay for their keep and treatment.

10. Tavelams to be subjected to inspection, and restriction when deemed advisable.

11. Regulations to be made by the several Government Agents suitable for each Province, and proclaimed in the usual manner.

Of all the above recommendations, we believe the only one which was carried out was the provision by Government of male animals of a superior breed for the use of cattle owners; but the result was so discouraging that even this effort at improvement was, after a time abandoned. The quarantining of cattle imported from India seems never to have been seriously entertained by Sir Hercules Robinson's government. At this we cannot bo surprised; for although the Commissioners leant to the opinion that murrain was often introduced into Ceylon from India, they yet felt compelled to admit that

Murrain as it exists in Ceylon is not the mere temporary outbreak of an epizootic, as has been the case during the late cattle plague in most parts of Europe, but that it has existed in, we may say (for all practical purposes) on indigenous state for years.

This consideration and others equally cogent prevented the recommendation of specially stringent measures. The summing up of the treatment recommended to prevent the outbreak of disease and its spread when it had appeared was:—

Thorough cleanliness, both of the cattle sheds and personally among the attendants. Removal of all filth which is continually accumulating, and the sprinkling the contaminated parts of the floor with lime or wood ashes, or both. The free and frequent use of carbolic acid, for the purpose of destroying all germs of contagion which are floating in the air or contained in the excretions. Or, in the absence or scarcity of carbolic acid, the substitution for it of sulphur vapour and tar. Tho prevention of all communication with unhealthy cattle. The consumption by fire of all rubbish, whether bedding or dung, as often as possible.

All excellent measures if only the natives, amongst whom ignorance is the parent of so much cruelty, could be induced to carry them out.—In looking over some Administration Reports for 1870, the year after the report of the Cattle Commission had appeared, we find opinions quoted in one of them, which we expressed in 1869 and which, at an interval of twenty-one years, we can but repeat. Mr. L. Liesching was in 1870 Assistant Government Agent of Nuwarakalawiya, a district which, with accretions, was formed by Sir Wm. Gregory into the North-Central Province. Mr. Liesching wrote and quoted thus:—

Cattle disease has been the subject of much discussion and correspondence during the year. It is one on which it is easy to be eloquent; but it is exceedingly difficult to devise any suitable means of checking the evil, and the most plausible theories are easily demolished by those who know the practical difficulties in the way. It is therefore a subject for sincere thankfulness that Government has strenuously refused to pass any Ordinance that would be inoperative because it could not be carried into effect. Much that has been said and written on the subject relates to black cattle; but what is to be done with those incorrigible vagrants and determined fence-breakers, the buffaloes? How are they to be kept from forcing their great bodies through any impediments, and making their way through thorny jungles to their favouritie haunts and much-loved marshes?

In this District all agricultural operations are carried on by means of buffaloes, black cattle are only bred—or, to speak more correctly, are allowed to breed—for sale. It has often struck me on seeing the large herds of these latter running about the villages, of no use for agricultural purposes, and perpetually trespassing on the cultivated lands, whether they really are not on the whole a greater nuisance than an advantage—whether, taking into account all the damage one of them does from his infancy until he has arrived at bull's estate, he has not cost more than he will ever realize. I should not however have ventured to give utterance to an idea so heterodox, but for the following passage which I met with recently, quoted from an Indian Journal:—

"We cannot help thinking that Indian villagers are under some kind of delusion that cattle are in themselves wealth, without reference to their use. At this season of the year, when the most familiar sight is a herd of cattle browsing on the grass and under every group of trees, each accompanied by the never-failing companion, the assiduous bird, *Pastor*, a passer-by cannot fail to be astonished at the number of unserviceable animals he sees grazing around him:—under-sized oxen, that are of no sort of use for the plough; old cows that are a mere framework of bones, guiltless of milk, and long past toil; and numbers of unwieldy buffaloes which are stupid and slow for draught, and whose cows yield a very inferior article for the dairy. Then, too, it must be remembered, that a dead ox is of no value to the ordinary peasant. He cannot eat him, he will not skin him, he knows not that hoofs make glue, and horns combs; and his only wish is to throw the carcase somewhere where the *chumars* or the *pariah* dogs may easily get hold of it. Altogether, it seems to us that there is a large element of the national shiftlessness in cattle-keeping, and that many of the small farmers would only be able to assign custom or village reputation as a reason for the retention of so many animals they do not want, and which are neither ornamental nor useful."

On this the Editor of the *Ceylon Observer* says—

"There is immense cruelty in the insensate ignorance of attempting to rear cattle without the means of properly feeding them. In such cases the wretched animals, with vitality at its lowest ebb, drag on a weary existence, to yield it up at the first attack of inclement weather or disease. * * * *

"To convince the ordinary jungle natives that they are morally responsible for the proper feeding and sheltering of the animals they attempt to rear, will be a work of time, but the work can be expedited indefinitely by the action of really conscientious servants of Government in the higher positions, who can exercise not only 'moral suasion,' but a good degree of benevolent despotism. That the natives can be kind to their animals, on the principle which actuates slave-

holders—self-interest—is shewn by the attention paid to the feeding, and the consequent general condition of the cart bullocks. It is quite right the Government should be urged to do its best to prevent disease, which originates where natural laws are neglected, from spreading and inflicting loss where those laws are fairly observed. But the difficulties here are greater than in Europe, owing to some extent to climate, but mainly to the gross ignorance and stolid conservatism of the people. While, therefore, demanding that all that is possible should be done, we must not expect the evils of ages to be cured in a day. We have great hope in the extension of irrigation works. They will lead to large supplies, not only of grain for human food, but of straw for cattle. Experimental farms, well conducted, too, ought to do good."

It is not buffaloes alone (the species of cattle really useful for agricultural purposes) which do mischief by straying and trespassing. Ordinary cattle go prowling about of their own accord; and the investigation of cases of alleged cattle stealing are frequently complicated by the fact that cattle-owners, who deliberately turn out their cattle at night to feed on the fields of their neighbours, bring false cases of theft against those who capture and impound such trespassing cattle. As a rule the natives own ar more cattle than they ought, with reference to means of feeding and shelter, the latter often non-existent, and murrain which sweeps away the debilitated animals, predisposed by inanition to attack, may be regarded, often as merely Nature's agent employed to restore a just balance. One of the most extraordinary statements in the report of 1869 was to the effect that "The Pali records of Ceylon contain no allusion to cattle plague or to cattle." As to cattle plague the assertion is probably correct, although the non-mention of the disease is by no means evidence of its non-existence. We may take it for granted that ever since human beings commenced to keep flocks and herds, the diseases to which aggregated animals are liable appeared at intervals and were fatal in proportion to the violation of the natural laws which apply to such cases: neglect of cleanliness and fresh air, or the absence of abundant food and sufficient shelter. But the ancient literature of Ceylon, whether written on palm leaves or recorded on rocks, pillars or brasses, in noticing grain culture by irrigation, does not fail to mention the animals essential to such cultivation. Having referred the question to Mr. D. W. Ferguson, he has furnished us with the following note:—

"In the Mahâvansa there are frequent references to oxen and cows, the former being used for draught purposes in kings' chariots as well as in the farmers' plows. Cows' milk and milch kine are also often mentioned; sothat there cannot have been any prejudice against milking amongst the ancient Sinhalese. One reference to a cow and calf is a curious one. We read that Elâra, the Tamil usurper, was so just, that, his own son hp pening to kill a calf accidently by running over its n eck with his chariot wheel, on its mother's coming to make complaint by ringing the bell which the king had caused to be suspended at his bed-head for those who sought redress, the monarch struck off the prince's head on the same wheel! In the ancient inscriptions translated by Dr. E. Müller there are a number of references to cart buffaloes, as well as to cattle. I do not, however, find any reference to cattle disease in the Mahâvansa or the inscriptions."

The Commission obtained evidence that cattle disease was not unknown during the Sinhalese period, and it would be interesting now to ascertain, what notices if any of epizootics occur in the Portuguese and Dutch records of their occupancy of the Maritime Provinces. We have already corrected the statement in the report that ttle murrain was not noticed as prevalent in the early days of British rule. It is "an owre true tale" which the Commission told, true now as in 1869, that native cattle are degenerate, liable to disease, and in many cases have been exterminated by disease, results which they believed to be

Attributable to the following causes:—promiscuous and premature breeding, insufficient and inferior grazing, want of care of animals on the part of villagers, and more frequent work necessitated by reduced herds. The same neglect of ordinary precautions, the same indifference to results which distinguish the Sinhalese in all that regards the cultivation of paddy land, are equally manifest in their proceedings in reference to their herds. Except in certain parts of the Maritime and Kandyan districts, we have seen no instances of cattle owners providing shelter of food for their animals in inclement weather, or during seasons of prolonged and severe drought.

With such utter neglect of all the conditions conducive to the existence of a strong and healthy and useful breed of cattle, the wonder ought to be, not that disease is so frequent and so fatally virulent, but that any of the animals are left to perpetuate their miserable kind. A case is mentioned of a landed proprietor in the Eastern Province who at one time possessed 1,000 head of cattle, and who, in one year of murrain, lost all except 5. It is quite possible that the 1,000 exceeded by at least 50 per cent the proportion which ought to have been kept, with reference to the means of existence available for them. The Report of 1869 said: "Too much stress cannot be laid on the evil results of the existing means of cattle feeding." With this we quite agree, and although other measures of reform are of importance, this question of a better provision of pasture and forage for cattle outweighs them all. Abundance of nutritious food must be available, or all precautions to prevent disease with measures of cure will be in vain. But this question of cattle food must be treated in another article.

FORMOSA AND TEA.

If Formosa were in the hands of the British, it would probably be the most formidable competitor in the world with India and China in the production of tea. But the following details show that this naturally beautiful and fertile island is a scene of internecine strife and anarchy:—

News from China leaves no doubt that the outbreaks of the aborigines in Formosa have culminated in a general rebellion. Disturbances in that part of the island, which is inhabited by the native tribes (mainly the eastern and mountainous half), have become chronic, but the most serious of recent years were those in the south, which it was hoped were settled amicably a few months ago. Simultaneously the tribes in the north-east broke out in revolt, and the expedition despatched against them, although the Governor himself accompanied it, has been compelled to return, having suffered heavily both from the enemy and disease. The general in command has been degraded, a colonel has been beheaded for appropriating the pay of the troops, and it appears that the Chinese lost some of their guns. Soon after its return to Tamsui news was received of another formidable rising in the south, where the tribes, it was hoped, had been pacified. It seems to have been produced, like most other disturbances in Formosa, by the treachery of the Chinese local officials. The magistrate of the city of Hungcheng, which adjoins the territory of what the Chinese call "the savages," arrested two of the chiefs after the pacification, whereupon the Bhotans rose *en masse* and besieged the city. The magistrate not only gave up the men at once, but feasted the besiegers with abundance of pork and liquor, and on their departure promptly asked for troops to punish them. Five thousand men were

hurried up by sea and land, the general vowing that he will now exterminate the whole tribe and make a clear way to the east coast. The Chinese are said to be well armed with modern weapons of precision as well as with rockets for jungle warfare, the latter of which, however, they are unable to use. So far "the savages" appear to be triumphant all along the line from the south to the north-east; their borders have of late been extended, and it has only been by means of heavy bribes that they have been induced to keep within them. It is quite impossible to predict the result of the campaign now proceeding in the south. To judge by the majority of recent efforts to subjugate the aborigines the quarrel will be patched up for a moment, the troops will be withdrawn, and then the imprudence and arrogance of some local official will cause the flame to burst out anew.—*Times Weekly Edition.*

THE BRITISH NORTH-BORNEO COMPANY.

Mr. W.D. Gibbon, the local agent for this company, sends us the annual report and balance sheet for 1889, and also the report of the 15th half-yearly meeting held last month. Our London correspondent, in his letter of 11th July, mentioned several of the chief facts given by the chairman in his speech at that meeting; but we make a few additional extracts, as follows:—

From an official return of the tobacco sales in Holland last year, it would appear that no country produced tobacco which sold for more than 70 cents of a guilder per pound, with the exception of British North Borneo; whilst the price of the whole of the 1888 crop from our Territory averaged 125 guilder cents. Large sums of money have been spent in planting experiments in Zanzibar, Ceylon and other countries; in most cases with disastrous results. In Deli land is getting scarcer, whilst the price of tobacco is getting dearer. The sales of Sumatra tobacco this year have realized in some cases over 4s per pound; and I believe that a sample of Borneo tobacco has also been valued at this high figure. Under these circumstances, in spite of the difficulties in the early days of planting, there is every reason to believe in a great future for British North Borneo. ...

Next to tobacco, timber takes the second place in our list of products. This industry has greatly increased during the year. ...

It may be further stated that negotiations are in progress with an influential syndicate which may lead to the formation of an Exploration Company, and possibly also to the establishment of a bank in North Borneo, so that there a prospect of the country being more thoroughly and rapidly exploited in the near future than has been possible in the past. ...

The aggregate tonnage inwards was 67,623, and outwards from Sandakan 70,343, and I am glad to say our ports have been frequently visited by Her Majesty's ships of war, the influence of which is very acceptable, as evidence of the interest of Her Majesty's Government in the progress of the protected State. ...

As a further evidence of increasing business, the returns from the Treasurer-General show a large increase both in the note issue and in the demand for our copper coinage; thus the value of notes issued on the 31st Dec. last was over $100,000, as against $53,494 at the end of 1888. The Sandakan correspondence is returned for the year—in letters 17,998; papers and books, 14,677 parcels, 105; showing a considerable increase in 1888 under all the three heads.

We notice that a number of the shareholders at the meeting expressed dissatisfaction at not receiving any dividend, 12 voting that the report be not adopted, and 22 against this motion.

NUTMEGS IN GRENADA.—A West Indian planter in ordering the *Tropical Agriculturist* and offering to send us an occasional letter—an offer we gladly accept—adds:—"The staple on this estate is nutmegs, and we have lots of trees from 70 to 80 years of age, fine sturdy old fellows which bear enormously and look 'good' for another century."

PLANTERS' ENEMIES IN THE (FAR EAST) THE STRAITS AND WEST (GUATEMALA).

Mr. E. Woodhouse writing, from Penang on 22nd July, says:—

"Read, mark, learn and inwardly digest the herewith-mentioned 'bug,' which I guess is our old enemy (or new one perhaps I should say) green bug. The male, however, of the latter is a very minute little fellow, not more than half the length of a full-grown female. I regret to say I have renewed my acquaintance with the green bug during my travels lately; and saw a remarkably fine specimen of *helopeltis* in Perak.'

A New Insect.—M. Adolf Vendrell, a member of the Agricultural Societies of Belgium and Spain, has at the order of the Government of Guatemala, prepared a report on a disease that attacks the coffee plantations of the department of Amatitlan, in that country. Coffee was planted in Amatitlan at the time of the decline of the cultivation of cochineal. Owing to the poverty, want of depth, and perhaps neglect, of the soil, the coffee disease in question made its appearance about ten years ago, and the farmers attribute to its ravages the annual loss of half their crops. M. Vendrell states that the disease is an insect, "nothing more nor less than a new species if cochineal that has adapted itself to a different existence." M. Vendrell, after carefully considering the manner in which the insect should be clased places it in the coccidos family named by Dr. Claus of Vienna University. To the individual insect he gives the name of "coccus coffeæ." He describes the female as being "of the shape of a coffee bean, with a central line across the length, three pair of feet, a sucker or spur at the thorax, very conspicuous small eyes, and two or three whitish lines on the body." The male is similar, save that he sometimes, has wings, and is slightly larger. The insect settles upon the tender shoots of the coffee, and absorbs the nourishing juices as they flow towards their destination in the tissues of the plant. M. Vendrell advises the use of nitrate manures on the plantations, and recommends the intervention of the Government on account of the poverty of the cultivators.

CEYLON UPCOUNTRY PLANTING REPORT.

THE NEW "CEYLON HANDBOOK AND DIRECTORY"—A COMPLIMENT.

Aug. 14th.

The reception which your big book has received on all hands must have been very gratifying; for from the Governor downwards testimonials to that work have been both hearty and numerous, if I may judge by what has appeared in the *Observer* columns. No one who has taken the trouble to study the book will think this praise has been misplaced.

There is one remarkable feature in "Ferguson's Ceylon Directory," and that is that every succeeding issue seems to be an improvement on the preceding one. It goes on too increasing in bulk. I had the curiosity to put the volume for 1887-8 into the scale as against 1890-91, and the latter comes out *nine ounces heavier*. This increase is all new matter, for it seems as far as I could make out that the advertisements in both books are pretty nearly equal; in fact the older volume rather has it. Of course a test of this kind is of no value, in judging the merits of the book as a book; but when you begin to wander through its pages and note the wide range of the information therein contained, and more especially the practical nature of it; also the marked absence of anything which might be classed as "padding," it would appear that these nine ounces of new letterpress have a critical value, even when put in this avoirdupois way. The question is, if over half a pound weight of the book were to be cut out, could an excision of this kind be made without very much impairing its worth?

What one might be inclined to sacrifice another would refuse to: so that on the whole this added weight is all pure gain to the public. Speaking of so many ounces of new letterpress does not perhaps convey to the general reader a very clear idea of the extent of this added matter; but when I say that the ordinary *Observer* weighs somewhat less than two ounces, and that the increased size of the *Handbook* is equal to about FIVE *Observers* or say about a week's newspaper reading, the advantage to the public should be pretty manifest. For all this, there does not seem to be an increase in price. How is it done?

The get-up of the *Directory* is highly creditable to all concerned. When one remembers the style of binding of some of the earlier issues, looking for all the world like a fat boy in a jacket too small for him—and contrasts it with the finish of the 1890-91 edition, the advance is very marked. It adds very much to the pleasure of using a book to have it well bound.

In the "Planting and Agricultural Review," which forms the first portion of the *Handbook*. every product of Ceylon has its share of attention, and the information is brought well up to date. Under the heading "Sugar Cultivation in Ceylon," when, one would hardly have looked for late information, or indeed felt the need of it, there occurs the following passage:—"We had about two years ago (July 1888) an enquiry from a European at Nagpore who wished to try new machinery in manufacturing sugar in Ceylon; while one of the first questions asked by H. E. Sir A. E. Havelock after assuming the Government (May 1890) was, why sugar was not grown in Ceylon with its cheap labour supply." A big book like this, which is issued to the public in August, to bring its information on such a minor matter as sugar up to May of the same year, shows considerable enterprise. Since the last *Handbook* was published, cotton and tobacco have been very much in evidence in Ceylon agriculture, and the articles on these two products are well up to date, and very full in the information given. This is especially so in the article on cotton.

It is not a little interesting—and I would commend it to my brother planters when the rain prevents work and they don't know what to do with themselves, —to go over the Planting Review of the last "Directory" and compare it with the new edition. Although there is not much in the different articles that we don't know, still it is easy in comparing the different summaries to trace where there has been progress or retrogressive; and the marshalling of the many facts and figures, which individually don't seem to count for much, has a pleasing and enlightening effect. It is like a big field-day, with its march-past.

In a book of this size brought out in a busy newspaper office there needs must be errors. Several have been pointed out in the *Observer* columns, and more will be I doubt not. At page 654*, some six surveyors are down as licensed auctioneers—but perhaps they are that besides being the other.

Even with all the mistakes—and their number twice doubled—"Ferguson's Ceylon Handbook and Directory 1890 91" is a credit to the colony, and especially to the hard-working editors who have compiled it. PEPPERCORN.

A MYSTERIOUS AFFAIR.

With reference to the paragraph under the above heading which appeared in our issue of yesterday we give below all that we can find on the subject in our files of 1875. The following appeared in our issue of February 24th, 1875:—

We are sorry to learn, from the last Ootacamund paper, that nothing has yet been discovered of Mr. Broughton's, the Quinologist's, whereabouts. He reached Madras safely after leaving Ootacamund on the 7th December, for on the 11th of that month he wrote from here to the Manager of the *Neilgherry Courier*. It appears that Mr. Broughton sent in the resignation of his appointment in December, giving six months' notice, but that Government, in reply, offered him the option of retiring before the expiration of that period. It is conjectured, therefore, that he may have taken advantage of this offer, and proceeded to England. The Police authorities at Ootacamund telegraphed to Bombay at the end of last week for information regarding a Mr. Broughton who had taken his passage for England at that Presidency: but the result of the inquiry is not known. In connection with Mr. Broughton's name, it may be mentioned that a sample of amorphous quinine, manufactured by the Quinologist's Department, has been condemned, and that Government have directed the discontinuance of the manufacture; but our Neilgherry contemporary is informed that the condemned sample was prepared during Mr. Broughton's absence, and should not be taken as a specimen that Mr. Broughton's superintendence and skill might have produced.

In the issue of March 2nd, 1875, we find the following:—

We have received the following letter from Mr. O. B. Irvine, the District and Sessions Judge of South Arcot. 'As from a paragraph which appeared in your issue of the 25th instant it would appear that the friends of Mr. Broughton, the Government Quinologist, have cause for anxiety on his account, and that the latest tidings received of him were contained in a letter to the Manager of the *Neilgherry Couier*, dated from Madras, 11th December, I wish to inform you that Mr. Broughton was a passenger with me on board the B. I. S. N. Steamer "Ava," from Madras to Pondicherry on the 14th December, and that he then informed me his intention was to make a tour in Ceylon. This accounts for Mr. Broughton's movements up to a date nine weeks ago, and seems to prove that he did not meet with any misadventure in India. The opinion prevails in Madras that he has returned home in a rather informal manner, and has no idea of returning to the lucrative appointment that he held for some eight years as Government Quinologist at Ootacamund in connection with the Neilgherry Cinchona Plantation.' —*Madras Mail.*

* This is corrected in the Errata.—ED. *T. A.*

MANA-GRASS FROM CEYLON FOR MANUFACTURING BOARD—STANLEY-WRIGHTSON TEA CHESTS—MR. HUGHES ON MR. HOOPER'S ANALYSES OF TEA—TEA TASTING AND WATER —CLOVE CULTURE IN ZANZIBAR AND PEMBA.

Fourteen hundredweights of mana grass having arrived in England from Ceylon, the Stanley-Wrightson Syndicate met on Tuesday last to discuss its future arrangements. It was determined that this shipment of grass should be handed over to Messrs. Ibbotson, who have large mills at West Drayton, to be made by them into quarter-inch boards. The method of preparation consists in boiling the grass under great pressure, and then passing the pulp resulting from that operation through powerful rolling machines. Dr. Evans—who, as you have before been told by me, is the Consulting Chemist to the Paper Makers' Corporation of Great Britain and Ireland, and who carried out the first experiments with mana grass as you have been informed,—is to supervise closely the progress of these operations. Dr. Evans was present at the meeting of the Syndicate referred to above, and

thereat expressed his opinion as to the singular fitness of the grass for the purpose required.

The Syndicate, after coming to the resolution above-mentioned, then discussed the after-course to be followed by it, and a proposal,—should Dr. Evans's report be as satisfactory as it promises to be,—to form a company for manufacturing the board in Ceylon and to take over and work the Stanley-Wrightson patents for tea chests therein, was most favourably entertained, and there seems to be every probability that this will be the course which will receive ultimate adoption. You will fully recognize that this arrangement, so full of hopeful promise for the creation of a new industry among you, is dependent upon the success of this second series of experiments; but no one here feels any doubt as to this being achieved, and I shall feel equally surprised as disappointed if, before another twelve months have passed, the new company's mills are not in full work among you.

Intimately allied to the subject treated of in the two foregoing paragraphs is the verdict now obtained as to the condition in which the first shipment of Stanley-Wrightson tea chests has arrived at home; for the prospects of the industry above referred to are, of course, mainly dependent upon the success likely to follow that verdict. You have already been informed in these letters of what I had myself seen of these chests, as also of the satisfactory sales made of the tea which came home in them. We have now further learned that on the shipments made home by the "Cartbage" and "Oopack" there was a gain respectively on the landing and sale weights as compared with those of similar tea packed in the same number of ordinary wooden boxes of the same external cubical measurement, of 2·4 lb., of tea per package, and 3·12 lb. of tea per package. That is to say, that, whereas the 46 lb. of tea packed in the Stanley-Wrightson chests sold (roughly) as 48 lb., the 45 lb. packed in wood chests sold only as 44 lb. Freight and warehouse charges were the same for both kinds of packages, and you will be able to estimate from these figures one very material advantage obtained by the use of the Stanley-Wrightson chests. So far as my inquiries have as yet been replied to, I have not received a single expression of opinion in opposition to their use. It is, however, admitted by members of the Syndicate that, while the boxes seems to be a success, the lead paper linings used instead of lead have not so far proved to be so; but no opportunity has yet occurred for me to learn in what way or degree these last have proved to be defective.

If it had been possible for me to do so I should certainly have endeavoured to be present to watch the process of treating the mana grass during its conversion into board at Messrs. Ibbotson's mills. Unfortunately, absence from London will prevent my doing this, and I regret the fact exceedingly, because I foresee that very probably the introduction of this new industry into Ceylon may have a marked effect on the welfare of many of its inhabitants, for those well acquainted with the various purposes to which strawboard is now applied assure me that it is scarcely possible to over-estimate the many services it may be made to render.

During the present week opportunity has occurred for me to learn from Mr. John Hughes his opinion upon what we had in the *Tropical Agriculturist* not long back as to the efficacy of analyses of tea as stated by Mr. David Hooper in the paper by him abstracted in that journal. Mr. Hughes tells me that he wrote by the last mail but one to the Secretary of your Planters' Association directing attention to Mr. Hooper's paper and the conclusions stated in it, and suggesting that it would afford useful information to planters if some investigations were carried out in order to determine the amount of tannin present in the ordinary domestic infusion of ten minutes. Mr. Hooper, according to Mr. Hughes's view, contends that *elevation* has nothing to do with the proportion of tannin, but the latter gentleman considers that this opinion is in advance of facts ascertained by Mr. Hooper in his researches; for out of the 65 samples reported on in the paper, only 6 were from Assam at an elevation of 600 feet, the other Indian teas analysed representing estates at an elevation ranging from 2,500 feet in Travancore to 7,800 feet in the Nilgiri ranges. Most of these Indian teas therefore represent hill estates, and as such it is reasonable to conclude that the proportions of tannin should in such cases represent about the same quantities as are found in tea grown on the hills in Ceylon.

Mr. Hughes continued the expression of his views to me by pointing out further that Mr. Hooper's results give the *total* amount of tannin present in the teas, and not the amount extracted under ordinary circumstances. Mr. Hughes regards this as being a fact to be regretted, because Mr Hooper, in a small set of experiments subsequently made, showed that only about one-third of the total amount of tannin contained in the tea is usually extracted by the ordinary teapot infusion, and he holds that this constitutes the practical side of the question which calls for further analytical investigation. He quoted to me one sample of tea so dealt with by Mr. Hooper which yielded 3·04 of tannin, while another gave twice as much, viz. 6·26. What Mr. Hughes therefore thinks to be desirable is a thorough examination of reliable samples with a view of definitely deciding, not only how far the amount of tannin is influenced by elevation, but also by the various processes of manufacture, the time allowed for fermentation, different conditions of temperature, and other circumstances which effect the flavour and probably also even the constituents of tea. He mentioned to me that tea making depends on chemical reactions carried out under certain conditions of temperature, and that as the strength of tea depends on the proportion of tannin, a careful determination of the constituents would be useful to planters as well as interesting to the general public.

So far as my own very deficient knowledge can justify me in forming any opinion upon the points treated of by Mr. Hughes, it would seem to me that it is the last mentioned body, *i.e.* the general public, to whom such an investigation would prove to be first useful. The utility to your planters would, I should say, follow upon indications of appreciation shown by the public of certain growths which might comply most closely with results obtained by the investigation proposed. As a matter of fact, when A. purchases tea he can receive but little aid to his judgment by any published analysis of it at present available to him. He may buy a pound of tea of a kind said to contain but little tannin under *full* analysis, but from which his system of domestic infusion may extract tannin in far larger proportion than would be yielded by another description of tea stated to contain a far larger proportion under analysis than that bought by him. It is therefore not to be doubted that if a standard for analytical examination was established and worked upon which should approach closely to the ordinary conditions of domestic practice, A would obtain a far more reliable guide than he has at present. We hope your Planters' Association will take this matter up, because it is important for your planters to learn

with some degree of certainty what growths and what processes will the nearest meet the tastes of consumers. These vary so much in different countries that probably tea required by users in America or Russia might demand a different system of curing altogether to that which satisfies the English palate. What your planters want, as it appears to me, is reliable data upon which to found—and vary as need may arise—the practice of their treatment of teas for the several markets, and this it seems natural to expect could best be afforded by the results to such experimenting as Mr. Hughes suggests.

But that gentleman, during the discussion of the foregoing topic, mentioned to me a further circumstance which must have a very important bearing upon the question. A little time back my letters mentioned to you how greatly at variance was the judgment of tea-tasters here with those of similar experts in Ceylon. At the time of my then writing, I ventured on an expression of my view that this might be due to the difference in the constituents of the waters used for infusing here and in Ceylon. At the same time such evidence as was procurable in support of that view were mentioned to you; but I had not then secured the authoritative evidence which Mr. Hughes has now afforded to me. He tells me that he has been informed by a gentleman largely interested in the tea trade, that some London firms who do a large business in Ireland actually import Dublin water to London for the purpose of testing teas intended for Ireland. It is scarcely possible to imagine a stronger evidence of the important results which the use of different waters for infusing teas may have than is this. The Irish have a great reputation as connoisseurs of tea, and it is known that they will pay a higher price for particularly fine teas than people on this side of St: George's Channel are willing to give. Very probably, if tea intended for the Irish market were selected here upon tasting done with London water, a shipment so determined might be altogether refused in Dublin.

Indeed it does not seem improbable that water has as important an effect upon tea as it has upon malt and hops in the manufacture of beer. Dublin stout we know to be famous, and Allsopp's has achieved its reputation mainly owing to the character of the water derived from the Trent. Now you cannot select the waters for your customers to use with your teas, but you may prepare for them teas which you can assure them will yield less of tannin according as they are infused with hard or soft water. So important are these two main divisions of water characteristic that Mr. Hughes tells me that along the whole of the south coast of England, where the water is for the most part hard, being derived from the chalk formation, tea grown on hill estates finds a marked preference by purchasers. This fact illustrates pretty accurately what should be aimed at by your planters, and very probably with the experiments suggested by Mr. Hughes others might be usefully combined to show how their results were affected by the use of different kinds of water. I feel this subject to be one of so important a character that no apology is necessary from me for the length at which it has been here dealt with.

Has the culture of the clove ever been tried in Ceylon?* Somehow or other it seems to me that we have heard of such a trial having been made. Anyway, in view of the great usefulness of suggestion for new industries, it may be worth while just to give you the following extract from the *Times* relating to the culture of this spice in and about Zanzibar:—

CLOVE CULTURE IN ZANZIBAR AND PEMBA.—The United States Consul at Zanzibar in a recent report states that the culture of cloves is the principal industry in Zanzibar and Pemba, the latter producing three-fourths of the total harvest, while Zanzibar produces the best quality cloves. The culture was introduced into the island in 1830, and today they are the principal sources of the world's supply. The clove of commerce is the bud of the clove-tree. It takes five or six years from the time of seeding for a tree to bear the buds. At two years of age the trees are 3 ft. high. They are planted 30 ft. apart at that time, and left with only ordinary care until they are ready to produce the buds. The latter do not ripen all at once, but at intervals during six months. They are then spread in the sun until they become brown, when they are warehoused, ready for market. A plantation ten years old produces an average of 20 lb. of cloves to a tree. Trees 20 years old frequently produce 100 lb each. The crop for the present year, which is the largest on record, will amount to 13,000,000 lb., averaging a local value of 5d a pound. A duty of 30 per cent *ad valorem* is levied by the Sultan. The only other parts of the tree which are utilized are the stems, which are gathered and are sold for about a fifth of the price of cloves, and with about the same percentage of strength. These go to make what is known as ground cloves. The plantations have hitherto been worked with slave labour, but the stoppage of the supply of slaves from the mainland involves increased expense for harvesting, as well as the risk of loss from failure to harvest quickly when the buds appear.
—London *Cor.*

* See Planting Review in our new Handbook.—ED. *T. A.*

THE JENOLAN CAVES IN NEW SOUTH WALES

have been described in a nicely got-up publication, by Mr. J. J. Foster, a presentation copy of which has been sent to us, by its recipient, for notice. These marvellously extensive caves are within easy distance of Sydney by railway across the Blue Mountains and otherwise, situated amidst charming scenery, in a district fertile, rich in varied vegetation and salubrious. The formation is limestone in which the shapes of fossil corals, shells and many other interesting marine objects can still be traced, the eroding agencies being mountain-born streams which flow through and form cascades in some of the caves. Stalagmites rise like marble pillars on all sides while stalactites assume the forms of exquisitely beautiful curtains and shawls, striped black, brown, cream color, yellow and white, and which are arranged in graceful folds. In some cases a diamond-like sheen is imparted by light reflected from the facets of thousands of crystals, white and amber-coloured. In one instance a depth of nearly 500 feet has been traced, but it is impossible yet to calculate the extent, size, or depth of the cavities. It is claimed for them that they are amongst the largest, the most numerous and the most beautiful in the world. Portions of the caves are bright with a marble polish, produced by the passage over them, during countless ages, of the numerous animals which made their abode in the caves, wallabies (a small species of kangaroo) especially. In a notice of the geology of the limestone stratum (interbedded with sandstone and shale) in which the erosion of water has produced the wonderful series of caves, it is stated:—

"It is not uninteresting to reflect that the limestone, now a compact grey marble, was once a mass of living corals, "stone lilies," and molluscs, revealing the former existence, in the Siluro-Devonian epoch, of conditions of marine life somewhat resembling those which support the beautiful living forms which buil

up the reefs in the coral seas of the present day; and it is significant of the vast changes this part of the surface of the earth has undergone, when we see fresh-water streams, at an elevation of several thousand feet above the sea, now flowing through rocks that were originally formed beneath the waves of the ocean at a very remote period of the earth's history. These silent rock-teachings give additional charm to the many interesting features of these caves."

Again:—

"There appear to have been two distinct periods during which stalactitic growth formed: one of comparatively remote age, and very local in character, being chiefly confined to the caves known as the Lurline and Bone Caves, and another but recent and still in operation. The older growth is essentially of a stalactitic type, and the salactites are remarkably thick; though in one or two cases, as in Chamber No. 1, a huge stalagmite is to be seen. The newer growth exhibits every fantastic and beautiful form known, from the thin hollow reed and transparent veil to the snow-white dome stalagmites, the crystal-fringed pool the wave-lined floor, and the crooked-fringed shapes that are turned in all directions."

Some of the names of the various caves (which, by the way, were discovered by the pursuers of a noted bushranger) are curious and some poetical:—The Grand Arch; the Devil's Coach House; the Nettle Cave; the Imperial Cave; the Lily of the Valley; the Fairies' Paradise; the Bushranger's Cave; McEwan's Hole (the haunt of the bushranger); the Glass Cave; the Mammoth Cave; and the Bottomless Pit! We cannot help quoting a passage from the description of one of the caves:—

"At once the vastness and silence of this chamber will rivet the attention of every observer, also the ripple-marked boulders all over the floor. Blocks of beautiful black marble may be seen in several places; many fossil shells are noticeable, embedded in the rocks; and fine chalk-like rock, both pink and white, may be found here. Now and then the noiseless wallaby may be seen continuing his stealthy flight from ledge to ledge up the walls; occasionally the wild mimicry of the lyre-bird re-echoes through this arch, though he himself may be safely hidden in the forest slopes outside. All these things combined make up one of the most wonderful and exquisitely harmonious pictures of nature's handiworks."

One cave, the specially beautiful objects in which are carefully protected, is lighted by electricity! In exploring the others the magnesium light is used. Mr. Foster, in concluding his description, writes:—

"Having visited most of the important caves throughout the world, viz., the Ajanta, Ellora, and Elephanta Caves in India, the Great Moulmein Caves in Burmah, others in Java and Japan, and the principal ones in Europe, I can with confidence say none of them can compare with the Jenolan Caves for their marvellous variety of formations, dazzling brilliancy of lustre, and exquisite colouring."

There are caves in Ceylon in our ancient limestone, in the modern lime formation near Point Pedro, and in our gneiss, as at Dambulla and elsewhere, inhabited by swallows, bats, and Buddhist priests; but we have nothing with natural attractions to compare with the water-worn caves in the ancient upheaved limestone of New South Wales.—The nearest approach must be the mammoth caves of Kentucky, and those we saw of Luray, Western Virginia, but Mr. Foster in his list does not mention the American caves.

TEA CULTURE IN BURMA during the past year showed a considerable improvement, although the industry is of trifling extent. The area under tea had increased from 14 to 164 acres and the approximate yield of tea from 1,600lb. to 12,250 lb. The cost of cultivation was R30 per acre, and of manufacture five annas per pound. Last year Burma produced no less than 2,764,457 tons of beet sugar.—*M. Mail*, July 29th.

CERTAIN TEA-PLANTERS of the Kangra District have petitioned the Local Government against the proposed assessment of land under tea in their possession, which was formerly held revenue free. The petitioners further ask that orders may be issued completely exempting the acreage under tea from assessment from the present time for a period of at least ten years.—*M. Mail*, July 18th.

EXPORTS OF INDIAN COTTON.—The following table published by the *Times of India* is instructive and useful for reference. It will be observed that there is a considerable increase in season 1889-90 over 1888-89, distributed over all the ports; but as respects the cotton export trade, the figures show that Bombay is first—and the rest comparatively nowhere—holding as it does about 80 per cent of the whole trade? The table is as follows:—

SAILINGS OF COTTON FROM ALL INDIA, TO EUROPE, CHINA, AND OTHER FOREIGN PORTS, INDIAN PORTS EXCLUDED:—

From	1889-1890. July to Dec.	Jan. to June.	Total bales:	1888-1889. July to Dec.	Jan. to June.	Total bales:
Bombay	188,111	1,348,238	1,528,349	143,884	1,151,837	1,295,721
Kurrachee..	4,533	28,332	32,865	5,567	41,563	47,130
Calcutta....	29,671	129,204	158,875	25,891	88,651	114,542
Madras	51,573	26,215	77,788	34,118	33,639	67,757
Coconada ...	26,336	7,770	34,106	13,967	2,823	16,790
Tuticorin ...	64,212	43,415	107,627	47,604	42,456	90,060
Total	364,436	1,575,174	1,939,610	271,031	1,360,969	1,632,000

CEYLON EXPORTS AND DISTRIBUTION 1890.

COUNTRIES.	Coffee cwt. Plantation	N'tive	Total.	Cinchona. 1890 B'nch &Trunklb.	Tea. 1890 lb.	Cocoa cwt.	Cardamoms. lb.	Cinnamon. Bales lb.	Chips lb.	Coconut Oil. 1890 cwt.	1889 cwt.	Plumbago. 1890 cwt.
To United Kingdom ...	46833	100	46933	5326127	30375175	8071	112293	635934	152586	25593	63575	92408
„ Marseilles	157	...	157	12500	612	79	...	47100	2800	...	...	...
„ Barcelona	...	...	...	...	...	...	...	24500	...	...	...	...
„ Genoa	12	...	12	...	1514	...	...	41425	17024	696	908	...
„ Venice	71	232	303	70412	1815	...	...	9000	11200	...	...	...
„ Trieste	7825	97	7922	252	1270	...	...	3900	8848	10895	5417	...
„ Odessa	32	...	32	...	15	...	...	...	...	700	2211	...
„ Hamburg	296	...	296	730	30819	787	1131	183800	52772	10265	5257	24594
„ Antwerp	17	20	37	108279	1600	...	...	12000	5600	304	1492	11050
„ Bremen	18	...	18	...	13389	151	...	18106	...	...	...	4041
„ Havre	...	100	100	...	...	...	...	10000	...	...	4578	...
„ Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
„ Africa	16	...	16	...	33030	...	...	5000	...	...	...	...
„ Mauritius and Eastward	220	270	490	...	31751	498	...	7500	...	38319	534	...
„ India	756	718	1474	...	87390	...	102792	5000	...	54419	22730	210
„ Australia & New Zealand	6151	919	7070	...	1411338	9	40	7260	...	1170	1737	342
„ America	1924	...	1924	260867	117968	1389	2271	64228	...	20034	77744	80942
„ Stockholm	...	...	...	...	173	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 28th Aug. 1890	64331	2456	66787	5800551	32109981	11039	218527	1074753	262030	162405		215203
Do 1889	53499	3869	57486	6544243	22804762	11537	190188	1563313	338555	186183		277074
Do 1888	101194	3891	105185	8305924	15036522	10271	189197	1023320	368621	225636		150830
Do 1887	139081	5844	144983	8832737	8235920	13707	215227	793653	163560	151698		150494

Constantinople 2122 lb. Tea.

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, 14th August, 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	Slightly softish to good hard bright ...	£7 a £8 15s
Yellow ...	Do. drossy & dark ditto...	95s a 115s
CINCHONA BARK--Crown per lb.	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 9d
	Branch	1d a 3d
Red	Renewed	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings	2d a 5d
	Branch	1d a 3d
	Twig	1d a $1\frac{1}{2}$d
CARDAMOMS Malabar	Clipped, bold, bright, fine	1s 8d a 3s
and Ceylon	Middling, stalky & lean	10d a 1s 6d
Alleppee	Fair to fine plump clipped	1s 4d a 3s 4d
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, bgt.	1s 6d a 2s 8d
Long Ceylon	Middling to good... ...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill ...	$7\frac{1}{2}$d a 1s 7d
2nds	,, ,, ,, ,, ...	7d a 1s 4d
3rds	,, ,, ,, ,, ...	6d a 1s 2d
4ths	Woody and hard... ...	$5\frac{1}{2}$d a 11d
Chips ...	Fair to fine plant... ...	$2\frac{1}{2}$d a $7\frac{1}{2}$d
COCOA, Ceylon	Bold to fine bold ...	95s a 105s
...	Medium	80s a 90s
	Triage to ordinary ...	60s a 70s
COFFEE Ceylon Plantation	Bold to fine bold colory...	106s a 110s
	Middling to fine mid. ...	102s a 105s
	Low mid. and Low grown	98s a 102s
	Smalls	97s a 101s
Native	Good ordinary	92s a 98s
Liberian ...	Small to bold	85s a 93s
East Indian ...	Bold to fine bold... ...	105s a 115s
	Medium to fine	100s a 105s
	Small	93s a 98s
Native	Good to fine ordinary ...	92s a 98s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£15 5s a £28
Stuffing ...	Coarse to fine	£5 a £18
COIR YARN, Ceylon ...	Ordinary to superior ...	£13 a £30
Cochin ...	Ordinary to fine	£12 a £36
Do	Roping fair to good ...	£12 a £15 10s
COLOMBO ROOT, sifted ...	Middling wormy to fine...	14s a 25s
CROTON SEEDS, sifted ...	Fair to fine fresh... ...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold... ...	50s a 65s
,,	Small and medium ...	26s a 38s 6d
Rough	Fair to fine bold	20s a 25s
... ...	Small	14s a 18s 6d
GUM ARABIC, Madras ...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	9s a 11s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES Pale, ...	Good to fine picked ...	10s a 10s 9d
	Common to middling ...	8s a 8s 9d
	Fair Coast...	8s 9d a 9s
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	$\frac{5}{8}$d a $\frac{3}{4}$d
LEMON GRASS ...	,, ,, ,, ,, ...	$1\frac{1}{2}$d a $1\frac{3}{4}$d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	$4\frac{7}{8}$d a $5\frac{1}{4}$d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White ...	,, ,, ,, ...	1s $1\frac{5}{8}$d a 1s $2\frac{1}{8}$d
PLUMBAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright...	5s a 9s
RED WOOD	Fair and fine bold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to good flavor ...	£30 a £58
Do. chips ...	Inferior to fine	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	5d a 8d
	Fair middling medium...	2d a 4d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	15s a 17s
Do. ...	Mixed middling [bright	14s a 15s
Do. ...	Bulbs	10s a 12s
Cochin ...	Finger	10s a 11s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	16s a 23s
2nds	Foxy & reddish 5 a 8 ,,	13s a 18s
3rds	Lean & dry to middling under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Soccotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	32s a a 35s
	Ordinary and middling...	28s a 31s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright ...	$5\frac{1}{2}$d a $5\frac{3}{4}$d
	Common dull to fair ...	$4\frac{7}{8}$d a $5\frac{3}{8}$d
Stems...	Common to good ...	$1\frac{1}{8}$d a $1\frac{1}{4}$d
COCULUS INDICUS ...	Fair ...	8s 6d a 10s
GALLS, Bussorah & Turkey ℔ cwt.	Fair to fine dark blue ...	52s 6d a 57s 6d
[cwt.	Good white and green...	40s a 50s
GUM AMMONIACUM per	Blocky to fine clean ...	20s a 50s
ANIMI, washed, ℔ cwt.	Picked fine pale in sorts,	£12 a £13 10s
	part yellow and mixed	£8 a £11
	Bean & Pea size ditto ...	£5 a £8 10s
	amber and red bold ...	£8 a £11
scraped...	Medium & bold sorts ...	£4 a £7
ARABIC E.I. & Aden ..	Sorts	32s a 75s
per cwt. Ghatti ...	Sorts to fine pale ...	20s a 70s
Amrad cha	Good and fine pale ...	50s a 65s
	Reddish to pale brown ...	25s a 45s
ASSAFŒTIDA, per	Clean fair to fine ...	26s a 38s
cwt.	Slightly stony and foul ...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 30s
MYRRH, picked ,,	Fair to fine pale ...	£5 a £6 10s
Aden sorts	Middling to good ...	72s 6d a 80s
OLIBANUM, drop	Fair to fine white ...	35s a 55s
per cwt. ,,	Reddish to middling ...	25s a 34s
pickings...	Middling to good pale ...	12s a 20s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER Mozambique,	red hard ...	2s a 2s $6\frac{1}{2}$d
per lb. Ball & Sausage	white softish ...	1s 5d a 2s
	unripe root ...	1s a 1s 11d
	liver ...	1s 3d a 2s 3d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb.	Nearly water white ...	4d a $4\frac{1}{4}$d
2nds ,, ...	Fair and good pale ...	$3\frac{5}{8}$d a $3\frac{3}{4}$d
3rds ,, ...	Brown and brownish ...	$3\frac{1}{4}$d a $3\frac{1}{2}$d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 6d
	Common foul and mixed	9d a 1s 10d
Rangoon ...	Fair to good clean ...	2s a 2s 4d
Madagascar	Good to fine pinky & white	2s 6d a 3s
	Fair to good black ...	2s a 2s 4d
SAFFLOWER ...	Good to fine pinky ...	60s a 70s
	Middling to fair ...	40s a 60s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	22s 6d a 24s 6
,, ...	Common & middling soft	12s a 21s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb.	Middling to fine ...	2d a $3\frac{1}{4}$d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ℔ cwt.	Good, pure, & dry white	160s
Japan ...	,, ,, pink	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	38s a 41s
	Pressed	nominal
Block [per lb.	Good ...	27s 3d
GUTTA PERCHA, genuine	Fine clean Banj & Macassar	3s 6d a 4s 6d
Sumatra...	Barky to fair	2s a 3s 4d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	1s 10d a 2s 9d
	Inferior and barky ...	1s 4d a 1s 9d
NUTMEGS, large, per lb...	57's a 80's, garbled ...	2s 10d a 4s
Medium ...	83's a 95's ...	2s 8d a 2s 9d
Small ...	100's a 160's ...	1s 6d a 2s $7\frac{1}{2}$d
MACE, per lb. ...	Pale reddish to fine pale	2s 6d a 2s 10d
	Ordinary to fair ...	2s 1d a 2s 4d
	Chips and dark ...	1s 6d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 2d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	9d a 1s 1d
	Dark, rough & middling	3d a 7d
SAGO, Pearl, large, ℔ cwt.	Fair to fine ...	17s a 18s
medium ...	,, ,, ,, ...	15s a 17s 6d
small ...	,, ,, ,, ...	10s 6d a 13s
Flour [per lb.	Good pinky to white ...	8s a 12s
TAPIOCA, Penang Flake	Fair to fine ...	2d a $2\frac{1}{2}$d
Singapore ...	,, ,, ...	2d a $2\frac{1}{2}$d
Flour ...	,, ,, ...	$1\frac{7}{8}$d a $2\frac{1}{8}$d
Pearl ...	Bullet, per cwt. ...	10s a 15s
	Medium ,, ...	21s a 21s 6d
	Seed ,, ...	16s a 17s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for September :—

NITRIFICATION.

IN the year 1877 Schloesing and Müntz gave to the world the results of their interesting experiments which went to prove that the conversion of nitrogen found in the soil in an inorganic form as ammonia, and in an organic form as decayed vegetable matter, into nitrates was effected by the agency of a living ferment. While these experiments have been verified by the English chemists, Warrington and Munro, no further light has been thrown on the nature of this germ since the continental chemists made their discovery concerning the minute organism which they considered assignable to the family of bacteria, though much interesting information has been gained as to the conditions under which the nitrifying germ works.

It is well known that different forms of nitrogenous substances applied to the soil act at different rates. Nitrate of soda acts more quickly than sulphate of ammonia; sulphate of ammonia than the nitrogen in guano, bone-dust, dried blood, &c. But what is the explanation of this difference in the rate of action of manures as plant food? Plants absorb the nitrogen they take as food from the soil in the form of nitrates, and in the first-mentioned manure the nitrogen is of course in this form. In the second the nitrogen exists as ammonia, which has first to be converted into nitrate before it becomes available as plant-food, and time is required for this conversion. The production of nitrates either from ammonia or from organic nitrogen is by the agency of the minute bacteria, whose importance was, as mentioned, only discovered in 1877. Till that year the production of nitrates in the soil was believed to have been brought about by a simple process of oxidation. The following experiment supplies the grounds for belief in the existence of the nitrifying germ as the cause of nitrification. If we take a dilute solution of ammonia, containing other plant food, and sterelize this solution, *i.e.*, kill any living germs that it may contain by submitting it to a high temperature for a lengthened period of time, we will find that such a solution will keep for any length of time without showing, on being chemically tested, any traces of nitric acid. Introduce, however, a very small portion of fresh soil, and nitrification will at once set in.

By experiment also it has been found that the nitrifying organisms are almost entirely limited to the surface soil, and that they are not uniformly much below a depth of 9 inches. They may, however, exist at a greater depth, but when they do so, they are found in a very feeble condition. Even in the surface soil their distribution depends on the nature of the soil, for the presence of these bacteria is favoured by certain conditions which may obtain to a greater or less extent in different soils. For one thing they require a large amount of oxygen, and hence it is only in the surface soil that their

complete development takes place. Here then we see one important reason for the need of the plough and other tillage implement for breaking up and thoroughly aërating the soil. Other conditions being equally favourable then, the more thoroughly the soil is aërated the more freely will nitrification take place. The presence of moisture is another necessary condition, and hence during a period of extreme drought nitrifioation is at a standstill. On the other hand if the soil be unduly charged with water, nitrification is again reduced to a minimum, as in the case of heavy, badly-drained clays, and this for more than one reason. Proper aëration cannot go on in a soil of this nature; while the presence of a large amount of moisture in a soil tends to reduce its temperature, and the temperature of the soil is another very important consideration. The action of the germs totally cease at a temperature below 12° C., while it goes on best at blood heat, that is about 98° F., and ceases again if the temperature be raised to 55° C., the germs being totally destroyed at 90° C. They are not killed by frost in the winter time in temperate regions, but only remain inactive and revive when the temperature rises, their action to any appreciable extent commencing above freezing point. Of course the presence of nitrogen in an organic or inorganic form is necessary, as also that of some salifiable base to combine with the nitric acid and form nitrates, the form in which plants take in their nitrogenous food. Thus we see the importance of preserving a proper mechanical condition in soils by ploughing, harrowing, draining and such operations as bring about this very necessary result; for, the elaboration not only of nitrogenous plant food by the agency of nitrifying germs, but also that of mineral food by oxidation is greatly dependent thereon. With regard to the theory—claimed severally by Hellriegel and McAlpine—that special organisms, to which the name of bacteriods has been given, are contained in the root tubercles of leguminous plants, whose function is to work up the nitrogen in the atmosphere into compounds and fix these in the soil. A great deal has been written of late; and much as one is inclined to favour this plausible theory when the peculiar feeding habits of this order of plants is considered, yet a good deal has yet to be proved before it can be accepted as an agricultural fact, and this is the view of Sir John Lawes in his latest deliverance on the subject in which he details his own experiments to test the theory.

INDIGENOUS FOOD PRODUCTS. CULTIVATED AND WILD.

By W. A. De Silva.

Leguminosæ.

24. *Dolichos Biflorus,* L.; Sin. Kollu.

This is a cultivated legume largely grown in the warmer parts of the island in chenas and other open spaces, generally with other crops. The leaves which are compound and somewhat large are green in colour and are hairy. The legumes are small and flat, and contain from 3 to 6 seeds. The seeds when ripe have a reddish polished appearance, and they are flat. In cultivation the crop is gathered three months after sowing. This legume is considered to be good cattle-food, the seed being boiled and given to stock for fattening. The stalks and leaves of the plant, when preserved, also form good and nourishing food for cattle.

As a food product this grain is not much used, except in some localities where it is boiled, and eaten.

25. *Cassia Fistula,* L.; Sin. Ehela.

This is a tree growing abundantly in the warmer parts of the Island, and is especially abundant in the dry districts of the South-east and North-west. The trees attain to a good height, the leaves are compound (pinnate), and the leaflets which are green and entire have a smooth appearance on the upper surface, and are slightly greyish on the lower surface, being pointed and of an ovate shape. The fruits are long cylindrical pods from 9 to 18 inches long, and sometimes more. The pod is divided into partitions inside, and the seeds are found in these. Along with the seeds a black pulpy substance is found which is of a peculiar sweet taste.

The young leaves are cut into small shreds, and a dry curry (mellun) is made with scraped coconut and other curry stuffs. The whole plant, including the leaves, have slight purgative properties. The bark as well as the root is given in native medical practice in cases of rheumatism.

The heartwood of the tree forms a good timber and is used for various purposes.

26. *Cassia Occidentalis,* L.; Sin. Peti-tora.

This plant is very abundant in the uncultivated places of the lowcountry. Though found in uncultivated places, it always prefers patches of land which are fertile. The plant is very small and much branched. The leaves are compound pinnate, and the leaflets are smooth. In shape the leaflets are obovate, having the ends round and the margins entire. The flowers are yellow, and the pods which are cylindrical, are thin and from 3 to 4 inches long. The seeds are rounded in appearance and long.

The tender leaves are made into dry curries, and sometimes they are boiled and eaten along with coconut, &c. The seeds roasted and pounded are used like coffee, and are said to possess medicinal properties. The leaves have cooling properties, and are used, boiled in water for fomenting in cases of swellings and wounds. The seeds also are used externally in skin diseases. The decoction of the leaves is held as a good remedy for purifying the blood. The dry twigs are used in making brooms.

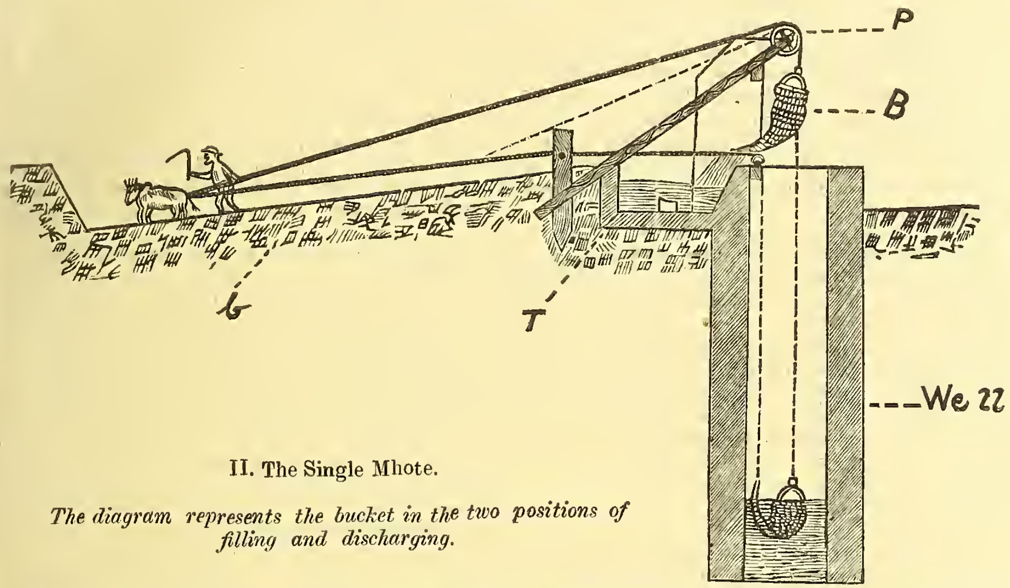
27. *Cassia Tora,* L.; Sin. Peni-tora.

This plant resembles the one described above in its habits, but the plants themselves are a little more erect and less branched. They grow to the height of about 3 feet, and the pinnate leaves are attached to a dark coloured stem. The base of the petiole is swollen at the place of attachment. The same character is observed in the attachment of the leaflets. The leaflets are pointed and ovate, and the veins show a black streak. The flowers are yellow and are borne in panicles.

The tender leaves are used in making a dry curry. The seeds are externally applied in skin diseases, and the leaves are used in cases of cough.

WATER-LIFTS. II.

By Aba.



II. The Single Mhote.

The diagram represents the bucket in the two positions of filling and discharging.

The single mhote or inclined plane water lift which is well known throughout India has been described as follows :—

"The water is lifted from the well in a skin bucket (B.) (those used in the Sydapet Farm are iron ones); to the bucket is attached a rope which is fastened to the yoke of a pair of cattle; a roller or pulley (P.) is fixed about 4 or 5 feet higher than the discharging trough (T.), over this roller or pulley the rope travels as the bucket ascends or descends. The bullock path (b.) is an incline. When raising the bucket the cattle walk down the slope until the bucket reaches the full height and discharges its contents; the cattle are then backed up the slope and the bucket sinking into the water, to be again raised by the forward motions of the cattle, and then the process is again and again repeated. This arrangement is certainly very simple, it is however equally certain that the cost of raising the water by it is very great. With this machine a pair of cattle while raising only 6,900 gallons of water in a day are exceedingly hard worked in doing it; whilst backing up an incline with a slope of about 45 degrees, about 40 times per hour, is a most effective way of rendering cattle worthless."

I am not aware of this water-lift being in use anywhere in Ceylon. The above illustration is from a set of models presented to the School Museum by Mr. C. Krishna Menon of the Madras Agricultural College.

NOTES FROM A TRAVELLER'S DIARY.

I lately had the pleasure and advantage of visiting, in company with an Agriculturist of some repute, the successful estate known as "Crystal Hill" situated about four miles from Matale on the Rattota road. The estate is about 320 acres in extent, and represents nearly all the products grown in the island. The first thing that strikes the eye of the visitor is the picturesque grove of areca-nut palms in full bearing, which covers about 30 acres. Annatto and cocoa are among the principal products, while several varieties of cotton have also been grown—the Egyptian having been found to be the best suited to the district. A large quantity of annatto is prepared for export, while the cultivation of the plant among the villagers is also encouraged by the estate buying up all the seed. Much credit is due to the energetic superintendent, Mr. A. Van Starrex, for the economical and successful manner in which he is working the estate, and the natives of the surrounding villages have an admirable example to copy, for on this estate they see how a variety of minor products may be remuneratively cultivated if they go about it in the right way.

I also touched at a place called Laggala, about 30 miles east of Matale. A part of the journey thither was made through splendid tea land, which at one time possessed some of the finest stretches of coffee in the island. The forests through which I had to pass were as grand as they were interesting from a botanical point of view, but as my journeys need to be expeditious (for I do not travel from mere love of travel) I could not make more than a few cursory observations.

Terminalia chebula (Sin. Aralu), Terminalia Belerica (Sin. Bulu), and Phyllanthus Emblica (Sin. Nelli) which are so much used in native medicine were plentiful here, while ebony and other timber trees were also common. The inhabitants of the district are comparatively ignorant and uncivilized. Kurakkan is their chief food, though paddy is also cultivated after a primitive fashion. Much damage I was told is often done to crops by wild elephants. The ubiquitous

Moorman is often met with even here, carrying goods in *tavalams,* with the object of bartering.

Wahakotte is a place about 20 miles to the North of Matale. The inhabitants are supposed to be the descendants of some Portuguese who settled here during the persecution by the Dutch—a large number being Roman Catholics. Here I had the pleasure of visiting the garden of Father Assauw of the R. C. Mission, who has by a judicious system of cultivation, converted an abandoned area of coconut property into a charming estate.

The palms on this estate are as healthy and fruitful as any I have seen, but the most interesting result of his agricultural operations is his vegetable garden, where a large number of English vegetables have been grown to advantage. Father Assauw's success is almost phenomenal, considering the dry climate of the district and the other odds he has to contend against. Carrots and turnips grow almost to perfection, tomatoes bear profusely, and cabbages show well-formed heads. The cultivation of these are, of course, limited to a certain part of the year.

What struck me most was a robust grape vine, which had been grown experimentally, laden with fruit. Pruning appears to be the secret of successful cultivation. Father Assauw encouraged by his success, is about to extend his vineyard. In truth, the garden I have described is "a model farm" for the district.

A VISIT TO A TANNERY.

In the course of last month the students of the School of Agriculture took advantage of the opportunity of visiting a tannery, and making themselves acquainted with the process of tanning hides. Few of the meat-consuming public in Ceylon can be aware of what becomes of all the skins of the animals that are slaughtered for food. Only a part of the hides produced in Ceylon find their way to the hands of our Ceylon shoemakers, the larger balance being exported mostly to England, though some reach France and Germany. The skins obtained in and around Colombo are all used up in the tanneries established by native traders (some four or five at the most) in the capital. The establishment about to be described is about the largest and most complete of these, turning out nearly 2,000 prepared hides per month, and employing about 30 coolies. A place of this description would compare unfavourably as regards size with an English tannery, such as may be seen in Bermondsley, but we must recollect that in Ceylon the supply of skins is very limited, and that there is no scope for extending the enterprise. It is with the greatest difficulty that Mr. D. Carolis, the courteous proprietor of the tannery situated not far from the Jawatte Asylum, gets a sufficient number of skins to keep the work going in his establishment, and he finds it necessary to go far from Colombo and make heavy advances to butchers and others before he can get what he requires. Mr. Carolis' tannery is admirably situated in a part remote from dwelling houses, the road leading to it being little availed of by the public.

The principal tanning materials used at this establishment are, the bark of Cassia Auriculata (Sin. Ranawara), Rhizopora Mucronata (Sin. Kadol), and gall-nuts from Terminalia Chebula (Sin. Aralu). The first costs 3 cts. per lb., the second only $2\frac{1}{2}$ cts. The skins of neat cattle, buffaloes, dogs, deer, and cheetahs are all prepared here. In tanning the skins three methods are adopted. The skins which produce the best hide are tanned by means of Cassia Auriculata, another coarser variety by the use of Rhizopora Mucronata, while the white leather used for some kinds of ladies' shoes is prepared by using alum.

The skins which are bought from the butchers and others every day, are steeped in water for a night, and next morning the fleshy tissues are scraped off. They are then immersed in tubs containing lime and water and kept in that condition for a week, the water and lime being frequently changed. The skins which are now swollen and soft, are washed well and subjected to a process of scraping with knives to remove the hair &c. If the skins are to be tanned by means of the two barks abovementioned, they are put in small tanks holding 30 to 50 skins, and the bark, which has been reduced to very small pieces, is spread in layers between the skins. The tank is then filled with water and covered up, the skins getting fresh bark and water once or twice, and being finally removed after four or five days and well washed. If up to this stage R. Mucronata (Kadol) has been used, the skins are subjected to no further process except drying; but if C. Auriculata (Ranawara) has been used (and a really good quality of hide is arrived at) the skins are tanned further by means of gall-nuts. The gall-nuts are smashed and placed in a tub in which boiling water is poured, and when the water is tepid the skins are put in and steeped for one or two days. Gall-nuts cost 3 cts. per lb.

The skins being now finally removed from tanning materials, are well dried and undergo oiling. The hides are spread on a large table and well-rubbed with gingelly oil. They are again air-dried and then put away for baling. Only good skins got from neat cattle undergo this latter process, and the preparation of a pound of hide of this sort costs on an average $12\frac{1}{2}$ cts.

Those skins which are prepared only with R. Mucronata are said to cost on an average only 2 cts. per lb.; and buffalo-skins are only prepared in this way. The market price in England is about 6 pence per lb. for this latter variety; the first quality fetching 10 pence per lb.

The alum process is used for sheep-skins and dog skins, no other material for tanning being there used. The dog skins are got from the animals condemned to death by Municipal authority—the value of a carcase being 3 cents. Dog skins are much used in England for gentlemen's gloves. The buffalo hides are used for saddlery and harness manufacture, while the first quality leather is utilized for shoes, boots and other purposes where finer leather is required.

Buffalo skins are also prepared for exportation without tanning them. In this case the skins are soaked in water, and after the flesh is removed, they are salted (8 lb. going to a skin). The saline liquor left was found when sprinkled over the surrounding coconut land to keep the land free

from grass and weeds. In this mode of preparation the hair is left on the hide.

The skins of very young calves and *fœtus* are also beautifully prepared with the fur on. They are used for slippers and fancy articles, fetching 5 shillings and upwards per skin. Bellows-skins are also prepared.

The offensive odour of a tannery is almost proverbial, but medical men give it as their opinion that it is by no means noxious. The coolies who were seen working were, according to the Manager, never the worse for the foul smells they inhaled.

This visit to a tannery impressed one with the idea of how much may be gained by energy and perseverance. Mr. D. Carolis has no easy time of it in working his establishment, and he well deserves the reward which he gains for his labour. In him his countrymen have an admirable example to imitate. We should not be surprised to hear in time of the by-products of Mr. Carolis' tannery yielding such valuable substances as glue and compost-manures.

CRUDE THEORIES REGARDING THE ORIGIN OF CERTAIN PLANTS. II.

By W. A. De Silva.

In my first instalment of this paper I gave the mythological origin of the paddy plant; in this, I propose to deal with the coconut tree which is only second in importance to the people of Ceylon.

The story runs, that at one time, there lived in a kingdom of the East a mighty king, resplendent with glory and surrounded by a large retinue of ministers, among whom were several wise men—both physicans and astrologers. These latter, by observing the stars and the courses of the heavenly bodies, professed to predict events and fix on "lucky" days and hours, and made reports of the results of their observations to the king. The astrologers royal, though well remunerated, were in no little dread of His Majesty who, if ever their predictions proved incorrect, immediately condemned them to be beheaded.

One day a learned astrologer of the Berawaya (tom-tom beater) caste, noted for his erudition, discovered after careful observation and calculation, that a certain day was exceedingly "lucky" for planting trees—in fact he went so far as to declare that anything, no matter what, planted at a certain hour on that day would be sure to grow into a tree which would be a great boon to humanity. The king being informed of this, though much gratified, was yet not altogether pleased with the bold assurance of the man, and thinking to puzzle him, enquired whether the astrologer's head, if laid on a stone, would there develop roots and grow into a tree. The answer was in the affirmitive, and to the great astonishment of the astrologer, the king forthwith ordered the experiment to be carried out. The severed head was accordingly laid upon the stone, and after a time lo! the noble coconut palm—the tree of a thousand uses—sprung up. And to this day, it is supposed the resemblance of the coconut to the head of the astrologer is preserved, for taking the husked nut as representing the head, the fibre represents the hair with the top knot (kondè), while the eyes and mouth are also supposed to be represented by three depressions.

There has been a good deal of discussion as to what was the original home of the coconut palm. Some claim this honour for Egypt where it was grown some 2,000 years ago, others for the Eastern Archipelago. There are reasons for believing that the coconut was first known in Ceylon, and its uses recognised in the 13th century of the Christian era, as no mention of the palm is made previous to this in the *Mahâwansa* and other standard native works, though mention is made of the palmyrah. Its introduction to Ceylon is attributed to a king of South India, who visited the southern part of our Island, suffering from a skin-disease, and whose image is still found sculptured in a rock near Weligama, where he is said to have resided, to which the name of Kustarajagala was given in remembrance of the great service he has rendered to Ceylon.

OCCASIONAL NOTES.

The newly-issued number of the Royal Society's Journal contains an article on the ten lessons of the "Eighties" by Prof. Wrightson, the Principal of Downton College. The first lesson which the Principal deduces is the value of combination and association by means of Societies, Chambers of Agriculture, and such like. The second lesson is the necessity for systematic instruction in agriculture in all its branches, and notes in this connection, the power and influence of the Agricultural press as an educational agency. The third lesson is the necessity for having the most improved systems of dairying taught and practised. The fourth lesson is that pasture land is now a more profitable investment than arable land. The fifth, that the withdrawal of three million acres from arable cultivation to one of pastoral inactivity must be an indication of the increased value of all fodder crops, including roots. The sixth lesson, that farmers must now look to their livestock rather than to their corn crops for their profits. The seventh, that economy in farm management must be better attended to than it has been in the past. The eighth, that ensilage may be made successfully and at very small cost and is decidedly useful. The ninth lesson is that science has done much for the farmer. And the tenth, that infectious diseases amongst stock must be rooted out.

"What," asks the *Agricultural Gazette*, "is the true position of an Agricultural teacher, and what is the class of knowledge which he should endeavour to impart? The question is a difficult one, for certainly is very large indeed, and there is in it scope for any amount of scientific lore. Of one thing we may be certain, that no knowledge can come wrong to an agriculturist. Even politics, political economy, astronomy, mathematics, engineering, &c., all on agriculture, so that the teacher's range cannot be too extensive or varied. And yet it is necessary to limit him, in some degree, in what he has to teach, if only to save him from despondency. First, he must be what he pretends to be—an agriculturist. If he is this, he is at least qualified to speak on

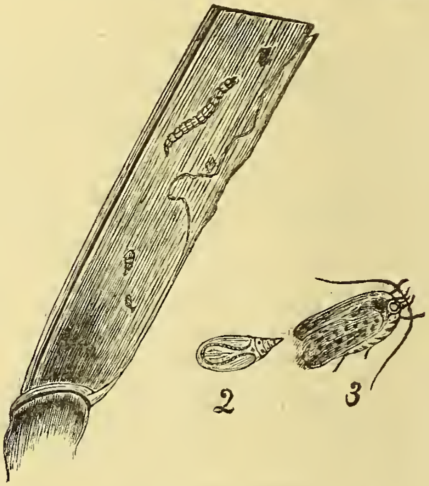
agriculture. He must also be so trained in the sciences as to be able to explain the methods of agriculture. This is not asking too much, as the same thing is successfully done in many other branches of knowledge." What the *Agricultural Gazette* insists on is that the agricultural teacher must not be expected to range beyond such limits as are placed on science, so as to include only so much of it as he requires for explaining the principles and phenomena of agriculture.

The *Law Journal* for January 25th reports a case decided by Judge Barber at Bakewell, Derbyshire, which is interesting from an agricultural point of view, and teaches the lesson, that an occupier of land who does not fence for himself must take his chance of his neighbour's cattle straying on his land, unless he can show by a long coarse of practice that the occupier of the neighbouring land has not only repaired the fence but was repaired for his neighbour's advantage as well as his own. We are ignorant of the law on this point in Ceylon, but it is well known that those who are annoyed by trespassing cattle generally take the law into their own hands and levy fines on the owners of such cattle —whether there be boundary fences or no—if they do not shoot the poor animals.

"Let me attempt to show," says Professor Drummond in his paper on the White Ant, "the way in which the work of the termites bears upon the natural agriculture and geology of the tropics. Looking at the question from the large point of view, the general fact to be noted is, that the soil of the tropics is in a state of perpetual motion. Instead of an upper crust moistened to a paste by the autumn rains, and then baked hard as adamant in the sun: and an under soil hermetically sealed from the air and light, and inaccessible to all the natural manures derived from the decomposition of organic matters—these two layers being externally fixed in their relation to one another—we have a slow and continued transference of the layers always taking place. Not only to cover their depredations, but to dispose of the earth excavated from the underground galleries, the termites are constantly transporting the deeper and exhausted soils to the surface. Thus there is, so to speak, a constant circulation of earth in the tropics, a ploughing and harrowing, not furrow by furrow and clod by clod, but pellet by pellet and grain by grain."

The *National Farmer and Home Magazine* in enthusiastic terms writes thus of the "pleasant phases of farm-life":—It is a common complaint that the farm and farm life are not appreciated by our people. We long for the more elegant pursuits or the ways and fashions of the town. But the farmer has the most sane and rational occupation and ought to find life sweeter, if less highly seasoned, than any other. He alone, strictly speaking, has a home. How can a man take root and thrive without land? He writes his history upon his field. How many ties, how many resources he has; his friendships with his cattle, his teams, his dog, his trees; the satisfaction in his growing crops, in his improved fields, his intimacy with nature, with bird and beast and the quickening elemental forces; his co-operation with the clouds, the sun, the seasons, heat, wind, rain, frost. Nothing will take the various social distempers which the city and artificial life breed out of a man like farming, like direct and loving contact with the soil. It draws out the poison. It humbles him, teaches him patience and reverence, and restores the proper tone to his system.

Dr. De Laval whose cream separators are now so well-known wherever dairying is carried out on a large scale, has invented an Instantaneous Butter-maker. Hitherto it has been generally held that a speed of more than 50 revolutions per minute was fatal to the making of good butter, but since the Plymouth Show it has been shown that butter of the very highest quality can be produced by the Instantaneous Butter-maker, the dasher of which revolves at the rate of 3,000 revolutions per minute. As a cheap and very simple labour-saving machine, and one that will enable any one to produce, at all times, a uniform and first-class quality of butter, its introduction to the dairy public at the Royal Agricultural Society's Show may well be said to mark an epoch in the history of dairying.



1, Caterpillar. 2, Chrysalis. 3, Moth (*Depressariar Cocos Nucifera*).

[The illustration of the coconut-leaf caterpillar which we are enabled to lay before our readers this month was drawn from life by J. P. Manchanayeka, a student at the Agricultural School. We are indebted to him also for most of the other illustrations appearing in these pages.]

It would be interesting to ascertain how many broods of the coconut-leaf caterpillars are produced in a year, and we shall be obliged to any of our readers for information, as to how many times a year the blight appears on trees. The scorched appearance of coconut trees in Captain's Garden and other parts of Colombo is also due to this caterpillar.

Before any definite suggestions could be made by way of prevention, it is desirable that more information about the life history, habits, &c., of the insect be gained. In the meantime it may be mentioned that the natural enemy of this

caterpillar, as also of a great many others, is the yellow and black-striped wasp called by the Sinhalese Kumbala (කුඹලා). These wasps, as our readers are aware, collect caterpillars for the food of their own larvæ. Their nests are built of mud and are found attached to doors, windows, &c. of dwelling-houses. The nests are composed of several cells or chambers, in each of which the parent wasp lays an egg, and fills the cell with caterpillars. It is considered a very great fault by the Sinhalese to destroy one of these nests, not from any superstitious belief, but from the great service these insects render to the agriculturist.

DESTRUCTION OF CATERPILLARS.

Miss Ormerod, Consulting Entomologist to the Royal Agricultural Society of England, reporting on the infestation of trees by caterpillars, says that much attention has been lately directed to ascertaining what reliable measures could be adopted in order to destroy the hordes of caterpillars which now appear almost as a regular yearly recurring cause of serious loss to fruit growers. "It has become more and more plain each year," she says, "that although sticky banding is so far of services, that in many cases the foliage of orchard trees would have been totally destroyed if the banding had not been done, yet still it is only a partial protection against wingless moths gaining access to the trees for egg-laying, and is no protection at all from the many kinds of attack originated by winged infestations; also it is expensive, needs renewing at intervals, and, without special arrangements to insure safety to bark, is detrimental to the health of the trees. Measures were found to be absolutely necessary of a kind which could be brought to bear on any or all sorts of caterpillars together (whatever their various natures or previous histories may have been), and would kill the whole collection of ravaging hordes at once, but without damaging the leafage. . . . . In my own suggestions as to applications I limited myself to advising trials of "Paris green" spray, as with this application we had clear information from the U. S. A. and Canadian Government reports of the exact proportions in which it was to be used, and of every detail concerned, and also of its success, and warnings as to requisite caution in use, it being a poison; for those who did not care to try it (by advice of the Dominion Entomologist) I suggested the use of washes of soft soap and mineral oil."

The Experiment Committee wisely made a trial and recorded the results of many applications, and of these the Committee recommended the following for spraying on infested trees:—Paris green paste one ounce to from 8 to 20 gallons of water (strength varying according to nature of tree); London fluid (that is a mixture of a preparation sold as "London purple") one part to twenty parts of water. Both of these the Committee recommend as effective in destroying the caterpillars, while they do no material harm to the foliage. The value of Paris green (arsenite of copper) has been attested by numerous private correspondents of Miss Ormerod. The syringing, according to the recommendation of the Committee, should be done when the leaf-bud is first developed, before the blossoming period, and then again after the blossom had disappeared and the fruit was forming. More than one correspondent concerned in fruit-farming says that, "Paris green is the only thing which we have found really efficacious—it has not damaged the foliage, but killed the caterpillar." The spraying is done by means of a pump and nozzle. It is noted by the Secretary of the Experiment Committee that were no such precautions were taken, "the trees were looking desolate—as bad as if fire had been scorching the trees." Messrs. Salmon, the well-known fruit-growers, writing to Miss Ormerod, says: "All that we can say about it is to its advantage. It has succeeded admirably. The trees look healthier and better, with as much (if not more) on, as anywhere else. They are beautifully clean. It has not injured them in the slightest degree. We shall always use it in cases of blight."

The above information comes most opportunely at this time when caterpillars are threatening harm to products in this island. The only objection to the spraying remedy in the case of coconut is the height of the trees which would require powerful pumps to do the work. One spraying ought however to be sufficient when the leaf bud is first developed, as no injury is to be apprehended to the fibrous drupes of the coconut palm as in the case of succulent English fruits. A gentleman writing from Batticaloa district mentions that smoking the trees by means of large smother fires showed an appreciable effect on the caterpillar blight.

GENERAL ITEMS.

Prof. McAlpine of Edinboro', botanist to the Highland and Agricultural Society, has invented an apparatus for testing the germinating power of seeds. By the ordinary system, from three to five weeks are required before a reliable decision can be arrived at, but by this new method Prof. McAlpine claims to be able to tell in five minutes not only the percentage of seeds that will germinate in any sample of grass seeds, but also the percentage of chaff, the percentage of seeds affected with parasites, and the number of weakly seeds. Already there is a deal of testimony from independent sources proving the accuracy of the claim.

We are in receipt of the following:—Journal of the Royal Agricultural Society of England, part second of vol. I, Third series; Report of the Stewards and Judges at the Kempton Park Show; and No. 6 of the "Universal Market," the International Journal of Industry and Commerce; the new Trinity College Calendar, and the Richmond College and Jaffna College Magazines.

The following were the subjects treated of and discussed at the meetings of the Agricultural Improvement Society during the month:—"The Opening of New Lands in Ceylon," "Is it Advisable for Ceylonese Agriculturists to Colonise Abroad?" "The Improvement of Poor Soils."

We cannot, (says the *British Medical Journal,*) hear that any satisfactory progress has been made in

starting the investigation which Mr. Chaplin promised some time ago should be undertaken into the very grave question of the prevalence of tuberculosis in cattle and milch cows used for human food. The frequency with which such tuberculous cattle have been seized in the market, the certainty that a much larger amount is sold and enters into our daily food, the grave consequences which are believed to follow the drinking of uncooked milk from tuberculous milch cows, invest this promise of the Minister of Agriculture with serious importance. It is very desirable that the matter should not be indefinitely hung up.

Veterinary Surgeon Robert Mitchell states that ten ounces of chloroform and six ounces of ether were required before a bull (on which he operated for tumour in the throat) succumbed to the influence of the anæsthetics.

Prof. Duncan of Glasgow gives two instances of food adulteration which came under his personal observation. An analysis of a sample of milk proved that it was a compound of about 70 per cent of pure milk, 30 per cent of water, and an emulsion composed of borax, and coloured with annatto. The other case was one of adulteration of preserved vegetables with sulphate of copper—a subject which was engaging the attention of the French authorities. As a matter of fact, the Professor states, every large grocer in Glasgow sold green tinted articles of that kind which owed their colour to sulphate of copper. The vendors alleged that their customers would not buy peas unless they had the green colour, and they could not have that colour without the sulphate of copper. Many cases were on record where poisoning had occurred through the partaking of food containing the salts of copper.

Mr. N. N. Banerjie, M.R.A.S., and F.H.A.S. having studied Pasteur's system of inoculation for anthrax has been employed at Seebpore in experimenting on Indian cattle with great success. He is now working for the Government of India, and his laboratory has been transferred to Poona.

The lint which clings to cotton seed, after it has gone through the gin, is being utilized to make felt, which it is said, will be greatly used for hats &c., as the process of felt-making in this manner is inexpensive and the material used has up till now been considered a waste product

The Indian Agricultural Conference at which representatives from all parts of the Empire will be present, is expected to meet at Simla about the end of November.

Fromentine is the name given to a new alimentary material which consists of the embryo-plant to be seen as an oval structure at the base of the wheat grain, which is discarded in the process of milling. By analysis it has been shown to contain 51·30 per cent of albuminoids, 29·08 of carbo-hydrates other than cellulose, 12·03 of cellulose, and 6·98 of mineral matter or ash. The richest kind of meat—that of sheep—contains only 21 per cent of nitrogen. The digestible matter in fromentine is 87 per cent of the total weight. Owing to its high nutritive value and easy digestibility it is claimed for fromentine that it possesses special qualities as a food for infants, convalescents, and anaemic subjects. It is suggested that the germs of barley, oats, maize, &c. may be similarly utilized. It is, in any case, interesting to learn that in fromentine, a substance of exclusively vegetable origin, there exists a percentage of nitrogen much higher than those contained in the best kinds of meat.

The latest horse-shoe in Berlin is constructed of layers of paper glued together and subjected to hydraulic pressure; each layer is treated with oil, turpentine, &c., rendering it impervious to moisture, and the specially manufactured glue is insensible to the influences of moderate heat and water. This paper shoe is attached securely to the hoof by means of gutta-percha, and being very elastic, permits of the expansion of the hoof. It is very tough and durable, and wears rough, this greatly preventing horses slipping.

S. W. H., in the Jaffna College "Miscellany," says that the word "paddy" (corresponding to the Tamil word *nellu*) is evidently the same as the word *batta*, which is used to denote the allowance for money for daily food to persons away from home. They are both the Tamil word *padi* which means a measure. A measure of rice is the daily allowance for a man; thus the word came to mean the rice which is allowed and hence rice in general; and further (as *batta*) an allowance whether in rice or its value in money.

Received with thanks for the School Museum, samples of coffee (parchment, peaberry, and Liberian), and a mature miniature coconut about the size of an ordinary marble.

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THE FUEL QUESTION IN CEYLON.

ALTHOUGH matters are not in the critical position which Mr. Berry White in his left-handed benevolence toward Ceylon represented ("the wish being father to the thought"), and although the tea enterprise is not likely to fail because there is "not a stick of firewood left," yet the fuel problem is undoubtedly a serious one, from the fact that so large a proportion of the tea estates were formed on the sites of coffee estates, whence nearly every trace of timber had disappeared. If the heavy demands of the railway are included, we can easily believe in the correctness of the estimate, although it was questioned by our good friend, Mr. A. H. Thomas, that the produce of 100 acres of forest per annum would be required to supply the demands of the one district of Dimbula. That is with reference to the present consumption: but be it remembered, that while the demand for tea furnaces increases with the increasing yield of tea, there will soon be a large additional requisition on the Government reserve forests for railway purposes, when trains begin to run from Nanuoya across "Summit Level" to Uva. One of the speakers at the Nuwara Eliya meeting evidently understood by the felling of 100 acres of forest for fuel that a clean sweep would be made of the standing trees, large and small, young and old, on the space indicated, and he contemplated the passing of the cleared Government forest into private hands by sale. No wilder idea could be entertained, and that apart from the rule, prohibiting sales of forest land at an altitude exceeding 5,000 feet. The authority who estimated the extent of felling required undoubtedly meant the equivalent in firewood of 100 acres of Government forest, as dealt with on proper scientific principles, such as have been adopted in the treatment of the forest above Nanuoya, on the right hand of the road to Nuwara Eliya. It is only the mature, old and damaged trees which have, in the blocks dealt with, been cleared and converted into timber and firewood, while the younger and healthier trees and the saplings have been spared. In the spaces thus partially cleared of trees and thoroughly cleared from *nilu* and other undergrowth, fast growing Australian trees, such as gums, acacias and, we suppose, casuarinas, are to be planted, with reference to future supplies. It is not probable that any portions of the Government forest reserves will be alienated, unless indeed some enterprising capitalist, able and willing to wait for deferred returns, came forward and offered to take land on the condition of at once planting it up with trees, calculated, when grown, to yield supplies of timber and especially fuel. We fear there are few in circumstances to face the risks of an enterprise which would probably pay in twenty or thirty years, in view of the demand which must increase for timber suitable for railway sleepers and other purposes and for railway and tea estate fuel. The danger as regards the speculator would consist in what we all so earnestly desiderate for the benefit of the tea enterprise, the discovery of some cheap artificial fuel which would render unnecessary the present fearful waste of wood by combustion in furnaces and for the production of charcoal. When discussing this question some years ago, we noticed the fact that under the advice of their sagacious Visiting Agent, the proprietors of the group of tea estates known as K A W purchased forest sufficient to enable them to possess one-third forest for two-thirds cultivated land. We also quoted Mr. Rutherford's strong recommendation that trees good for fuel should be planted on every tea plantation not possessed of forest reserves. We now add advice which we are carrying out in practice: that is, as the reserve forest connected with an estate is denuded of the natural growth, to supply the clearings with good fast growing fuel trees. On estates possessing no forest reserves and where supplies of fuel from outside are not readily obtainable, it might be wise to plant up pieces of poor tea, the sides of streams (specially favourable for red gums), and exposed knolls. In calculating the amount of fuel available in 100 acres of forest in Dimbula, the character of the greater proportion of the forest reserves must be taken into account. In those elevated woods tropical luxuriance of growth does not take the shape of large trees thickly planted over the surface. The sparseness of well-grown trees, and the rarity of forest monarchs (hollow-hearted monarchs too often when they do exist,) strike the explorer of those mountain forests, as well as frequency of open spaces in the heart of the woodland, down into which the sunlight streams. In some cases those retreats of elephants and deer in the

solitudes of the forests, are merely covered with coarse grasses, with osbeckias and a few other shrubs scattered about. Generally, however, the sparseness and the small size of the trees is compensated for and the good character of the soil vindicated by dense and in some cases very tall undergrowths of *nilu*, the stems of which often furnish, in a convenient shape, "waratchies," which, tied to posts, form wattle and daub buildings of more than a temporary nature, when thoroughly plastered, well roofed and protected by verandahs. Judging from our personal experience the hill forests of Dimbula and other districts with similar conditione, are likely to be increased manifold in value, when trees introduced from Australia, the Himalayan regions of India, Japan, &c., are substituted for most of the indigenous trees, and when really scientific methods of thinning, pruning and coppicing are resorted to. The readiness with which the Australian gums coppice and their tenacity of life make them valuable additions to our sylvaculture. A very considerable number of foreign trees have been introduced and are being tried, from the eucalypti and acacias of Australia to the oaks, birches and pines of of the Himalayas and Japan. As regards the Australian casuarinas and several of the eucalypts, we know that they are reckoned good fuel yielders in their native habitat and we suppose we may calculate on their retaining their characteristics as grown in Ceylon. But experiments such as have been conducted on a large scale in the United States in connection with the census would be valuable here. Specimens of all the American timbers have been subjected to combustion after a mode best calculated to test their calorific qualities and the results have been published. Something of the same kind effected, especially in regard to introduced trees—for the qualities of most of the native timbers have been eettled by railway and tea furnace experience—would be valuable. Meantime Mr. Wright's experience with coal is exceedingly interesting; and although coal alone may be too expensive for tea drying, it may be a question whether a small quantity of coal added to wood in a furnace might not largely increase the heat evolved without proportionate addition to the cost. In connection with the vast quantities of coal handled at the range of supplying stores on the Colombo beach, there must surely be a considerable quantity of waste in the shape of small fragments and dust, which might be sold at a moderate price for use on tea estates; pressure being applied to the loose stuff before it is carried by the railway at third-class rates, such as are applied to manuree, cement and other like goods, sent in quantities of 4 tons and upwards. Then there is the prospect now of Indian coals of a fair quality being available at a price considerably lower than the "black diamonds" from Cardiff and Newcastle can be sold for.

What the fuel demands of the railway are and are likely to remain, may be judged from the fact that to supply fuel for the 45 miles between Colombo and Polgahawela, Col. Clarke in his recent report proposes to appropriate 10,000 acres of forest along the line. That means over 222 acres for each mile of railway.

SUGGESTION *IN RE* CATTLE-DISEASE.

The figures published in Administration Reports and in the local newspapers of late, representing the loss of cattle through disease, have not been without their effect on the public mind; and once again remedial measures for the suppression of cattle-disease have begun to be discussed.

There is little doubt that every time there is an outbreak of murrain among cattle, the condition of the native agriculturist becomes more critical. The present distress in the Batticaloa district has the mortality among cattle for one of its causes, while the poor condition of draught animals in the agricultural districts directly bears upon the depressed state of paddy cultivation.

The question now exercising the minds of those who have the welfare of the agricultural population at heart is—what are the remedial measures to be adopted to minimize, if not to extirpate, the evils arising from a degenerate condition of the cattle of the country? Some would say, destroy all animals affected by, and predisposed to, disease; others, enforce stringent quarantine measures in times of disease; and others again, go to the root of the evil and endeavour to improve the breed and condition of stock. It has been conclusively proved, I think, that the first two methods can be carried out neither perfectly nor successfully in this island, the state and interests of the country being opposed to the adoption of these measures which may have proved efficacious elsewhere.* Choosing the alternative, let us inquire how the condition and breed of our stock are to be improved. Various useful suggestions have been thrown out; and good work has been done in eome quarters by collecting the advice of those who have had experience in these matters, and the suggestions of the commissioners who inquired into the state of cattle in 1869, also by putting these into a simple and popular form, translating them into Sinhalese and scattering this knowledge as far as practicable among the villagers. But the question is, will the people for whom all this has been done fully avail themselves of the advice and suggestions that have been offered them? From a knowledge of the people one cannot but answer "No," and ift he matter is to rest here little will have been done. But more must be done, and can be done if the subject of the improvement of stock received official recognition. Private efforts, however, honest and earnest, will never be successful, unless they received the *imprimatur* of the Government. There is no doubt that before long the legislature will become alive to the necessity of enforcing certain measures relative to the protection of cattle; and if, of the three alternatives to be adopted in dealing with cattle, either of the first two were favoured there will be a grave mistake, but if *the condition of stock is to be improved* there are ways in which the Government can help native agriculturists and other cattle owners. Firstly, it should be secured that cattle are kept under proper sanitary conditions: their surroundings should be cleaned, and they should be protected from undue exposure to rain and wind. The neglect of such treatment is nothing but cruelty and is worthy the attention of the Society that is concerned with suppressing such cruelty. But what is wanted is that certain minor officials—police, municipal, or special officers—should be empowered to charge cattle-owners (whether in towne or villages) who neglect to carry out orders enforcing the proper treatment of cattle as laid down by the legislature, with an offence involving a fine. It wae only within the last few days I became aware of the existence of murrain in two large cattle sheds in the heart of the town. The condition of especially one of these is shockingly filthy; and yet it seems that no action is being taken in these cases. Cattle are sold and removed, and I am informed that milk is supplied to two

* Not in the Madras Presidency, where utter failure is confessed.—ED. *T. A.*

large Government institution! At times when murrain is pretty general, especially in towns, why, I ask, should not the cattle-sheds where the disease exists be visited and disinfected, and the cattle as far as possible segregated. Municipal inspectors, when they hear of a case of smallpox or cholera, go armed with disinfectants and remove the patient to a hospital far away from town. Why should not the same thing be done in the case of cattle affected with murrain? An animal that shows the first signs of the disease should be immediately removed to the hospital for cattle, situated on the outskirts of the city at one or more than one point, and there treated according to the most enlightened system. The proper feeding of cattle is, however, a matter that it must be hoped cattleowners will come to see is compatible with their own interests, and the desirability of which can be only impressed upon the careless villager by semi-official influence.

But there is yet more that can be done, and that in the direction of more careful breeding. Each district should be provided with a stud bull (one selected for specially good qualities), which should be at the disposal of the people of the district. This would obviate the evil of cows being mated indiscriminately, and would probably lead to a desirable result, viz., the gelding at any early age of males which are herded promiscuously with females in village pasture grounds. The studbull should be under the charge of the headman of the village, who should see that proper care and attention is paid to it. Where practicable a small fee may be charged for the use of the animal, which would go towards the expenses of its upkeep, but the use of it should be given free to the poorer villagers. This plan, I think, would be the best; but it might be suggested in its place that a number of stud bulls should be stationed in the capitals of the provinces, and that these should travel through the country at stated periods. There is a precedent for the Government coming to the rescue of the agriculturist at a critical time, and even now this is being done in "that most distressful country," the Eastern Province, in the matter of paddy cultivation. So that it would not be too much to expect at a time when the extinction of our stock is threatened by disease, mal-nutrition, and bad-treatment, that the Government will supply stud-bulls and even give the use of them free.

If there are any better suggestions to be made let him who can make them speak: but these are the convictions of AGRICOLA.

NOTES FROM THE NORTH COUNTRY.

GLASGOW, July 24th.—Just a line to hand you the enclosed advertisements by Lipton & Stuart Cranston & Co.:—

LIPTON IN CEYLON.—To Lovers of the Fragrant Beverage.—Mr. Lipton who has just returned from Ceylon, has pleasure in intimating to his customers and the public in general that the extensive purchases he has made in Tea Estates enables him to supply the most delicions Tea the world can produce, at prices impossible for any other tea dealers to sell at. His estates, which cover many thousands of acres of the best tea in land in Ceylon, are at an elevation of 5,000 feet, where nothing but the choicest teas are grown; and, to give an idea of the labour reqnired in the cultivation and manufacture of tea on these estates, there are upwards of 3,000 natives, independent of Europeans, constantly employed. In buying Teas from Lipton, you get them at Planters' Prices. Consumers of the fragrant beverage thns save not less than six or eight intermediate profits, or 1s to 2s per lb. Note the Prices. Magnificent blends, rich, pure, fragrant. 1s and 1s 4d per lb. Extra choicest Ceylon and Indian blend, 1s 7d per lb.

☞ This is the finest and most delicious Tea the world can produce, and is equal, if not superior, to what is sold by most Tea dealers and grocers at 2s 6d to 3s 6d per lb. 5, 7, 10, and 20 lb. Packed in patent air-tight canisters, without extra charge. Lipton's Teas have a more exquisite aroma and delicions flavour than any Tea ever introduced into Britain. They have undoubtedly reached a pinnacle of success never before attained by any Tea in the world."

"DELIBERATE FALSEHOOD is the only term that can be applied to those who are familiar with the long prices obtained for fine Tea at Public Auction and by Private Treaty, and who yet strongly advertised the 'Finest Tea the World can Produce,' 1s 7d per lb., We prove the falsehood by offering our blend of Indian, Ceylon, and China Tea at 1s 6d per lb. Those strong, dark, bitter Teas—which grip the palate—are doing more real injury to the digestive organs than would result from the same money's worth of Raw Grain Whisky consumed within an equal time. Our Teas are mild and refreshing, and, like old matured whisky may be drunk with relish, and are followed by no evil effects. To clench this argument, We Stuart Cranston & Co., Trained Tea Tasters of 25 years' experience, admitted to be the keenest buyers in Scotland of fine China and fine Darjeeling, still pay regularly in the open market—patent to every Teaman in Mincing Lane—2s 10d, 3s 3d, 3s 10d, and even 4s 7d per lb. (duty paid) for the choicest China and Darjeeling Teas, buying them in lots of £300, £500, and £1,000 sterling in one line for one kind. The 4s 7d was a small lot, but long after it was sold out our customers came back, eager to purchase more—a clear proof that the quality and value were not fictitious but real."

Will it do the Ceylon planter any good for Lipton or any other man to advertise that he can sell the "finest (Ceylon) tea the world can produce at 1s 7d"? I very much doubt it, and I find many here of the same opinion. Ceylon folks at home have been greatly amused to read of Lipton's reception in Ceylon. When honorable members of Council and the leading members of the planting and mercantile community have vied with one another in doing honor to Glasgow's principal retail ham dealer, I suppose we may reasonably infer that caste prejudices are destroyed and the once despised "shopkeeper" is no longer to be looked down upon as a social outcast. If this be the result of Mr. Lipton's visit to Ceylon, then I for one will indeed rejoice. You remember the story of a visitor who, unable to understand the fine distinctions drawn by Colombo Society, asked a member of the mercantile community what was the difference in Colombo between the merchant and the tradesman as it seemed to him (the visitor) that they were all in trade. "The difference," replied the merchant, "is that the tradesman 'arfs 'is 'ams!" Great Scot! what will the members of Ceylon Society say now after bowing the knee to one who not only "'arfs 'is 'ams" but will sell you a much smaller quantity of ham any day you like to step into his shop just round the corner from where I now write. Well done Lipton, if he has helped to knock this nonsense out of Ceylon folk's heads. May he prosper abundantly by his Ceylon investment. At the same time I would ask him not to attempt to enrich himself by doubtful advertisements and by ways which can only injure his brother planters.

Enclosed is advertisement from the Edinburgh *Gazette in re* "The Indian Tea Bazaars Company Limited,' of which Andrew Polson is chairman:—

(Excerpt from *Edinburgh Gazette* of 3rd June 1890.)

In the matter of the Indian Tea Bazaars Company, Limited. Notice is hereby given, that at an extraordinary general meeting of the above-named Company held in the office of Messrs. H. & R. Lamond & Lang, Writers, 93 West Regent Street, Glasgow, on Friday the 30th day of May 1890, the following extraordinary resolution was passed viz.:—"That it has been proved to the satisfaction of the Company that the Company cannot, by reason of its liabilities, continue its business,

and that it is advisable to wind up the same, and accordingly that the Company be wound up voluntarily."

It was thereafter proposed, and unanimously agreed to by the said meeting. "That Mr. Robert Dempster, Chartered Accountant, 149 Hope Street, Glasgow, be, and he is hereby appointed, Liquidator of the Company for the purpose of the winding up."

ANDREW POLSON, Chairman.

THE DETERIORATION OF IRISH STOCK.

Miss Cooper, in a paper in the *National Review* entitled "Some Curiosities of Irish Farming," ventures, woman though she is, to lay her finger on the most serious point of the Irish difficulty, namely, the deterioration of Irish stock. Ireland, it should never be forgotten, is a great farm, and the lack of good sires is as much and more serious a matter to the Irish people than even the lack of good land laws or good landlords. Miss Cooper says:—

It became the general custom for landlords to keep a good bull, ram, or boar for the benefit of their tenants, and one of the evil effects of the land agitation and the Bill of 1881 has been that the practice is now given up, and the consequent deterioration of stock is becoming quite perceptible, it is said, in many parts of the country. There is great reason to fear similar deterioration in all branches of agriculture, now that the landlords and their agents are powerless to insist on some degree of good farming.

Miss Cooper does not say so, but one of the first duties of the first Irish Minister of Agriculture will be to establish a good bull, ram, horse, and boar in every district in Ireland. The first Coercion Act needed under Home Rule will be to compel the peasants to discontinue resort to "the shilling bull."

There is much in Miss Cooper's contention. To get rid of landlords is to banish capital and the benefits which follow on its use. The crusade has been against all landlords, good and liberal as well as bad and grasping. What Ireland wants is what she is frightening away: capital in abundance and well applied.

OOLONG TEAS—NEW USE FOR QUININE.

The following paragraph from a daily paper seeming to me to be likely to have interest from your planting readers, I give it place in this letter:—

FORMOSA OR OOLONG TEA.—The statistics for last year show a reduction in the export of tea from Formosa, which had hitherto escaped the depression in the China tea trade generally. On this subject the British Consul at Tamsui, in his last report, says that the tea season of 1889 has been most unsatisfactory both to foreign and native merchants. The teas of the island which formerly had a distinctive character are rapidly losing it, owing to the reckless competition amongst Chinese buyers for the Amoy market, and the careless preparation and fraudulent admixture by them of the teas after they come into their hands from the growers. This has told its tale on the consuming markets, and a lower basis of price than has ever been known before has been established, while the consumption shows a very marked decrease. With the yearly increasing competition from India, Japan, Ceylon, and Java, each of which countries fosters its tea trade while China does nothing for it, but rather taxes it beyond its endurance, the ground that Formosa has lost in the consuming markets is unlikely ever to be made up; and, in the opinion of those most competent to judge, the days of the trade are numbered, unless steps are taken by the Chinese themselves in the direction of radical reform. The Governor, who is one of the most energetic and liberal-minded of Chinese officials, has, in conjunction with a foreign merchant, procured the services of an experienced planter from India, who is to establish a model tea farm, and endeavour to show the people the advantages of the proper cultivation and manufacture of tea. The idea is an enlightened one, but whether it will be prosecuted with vigour and receive enough official support to ensure its success, remains yet to be seen. It is doubtful also whether the adoption of the most perfect methods can be attended with success while the inland and export duties on the article continue to be out of all proportion to its value and so far in excess of like imposts in all competing countries. America takes 90 per cent. of the Formosan tea, but there are indications of a growing change of popular taste in the matter of tea. As Oolongs seem to be little appreciated elsewhere than in the United States, any change of this nature would be the death-blow of the Formosan tea-trade as at present conducted. Hence the scheme already referred to is intended to include the preparation of teas of the Indian, Ceylon and mainland types, a market for which will, it is hoped, be found in London and elsewhere. It is merely peculiarity of preparation which produces the variety known as Oolong; the raw material is the same as that of Foochow, Hankow, and India, and a proper manipulation will produce a tea of precisely similar quality to the Souchongs and Congons of other tea ports of China.

It has never occurred to me to hear that quinine has been supposed to have the effect of absorbing actinic rays. My knowledge of such subjects is too defective to enable me to discuss the matter of the following paragraph cut from a scientific journal; but there may be those in your community to whom the subject treated of in it may be possessed of special interest, and who may be able to inform you of this property alleged, or presumed, to be inherent in the sulphate of quinine.

Dr. E. Liesegang says, in the *Photo Archiv*, as translated for *Wilson's Magazine*, "The expedient of covering a window with a fluorescent solution of quinine sulphate has not proved sufficient to keep out all actinic rays. This is better accomplished thus:—It is known that an aqueous solution of three parts green chloride of nickel, and one part red chloride of cobalt, is colourless by transmitted light, and quite clear when dilute. The two colours are complementary, and completely neutralise each other. Hence the light passing through the mixed solution has no effect on the salts of silver. Although it is quite white it is perfectly nonactinic, and does not any longer affect the sensitive film. To completely neutralise any possible rays in the ultra-violet, another glass is coated with a solution of quinine sulphate in collodion somewhat acidified with sulphuric acid. The quinine cannot be used in the same solution because it is precipitated by the cobalt salt. As the cobalt chloride, red when containing water, becomes blue when free from it, the mixture must not be allowed to dry. It may be made with gelatine and glycerine, but even a high temperature around the window may dry it. Silver paper which was left exposed for a week behind a thin layer of the cobalt-nickel solution thus prepared, did not show the slightest alteration. I have not as yet experimented with plates, but with sufficiently concentrated solution these also should not suffer change."

THE CHEMICAL ANALYSES OF TEA.

Any opinion expressed by Mr. John Hughes, the well known chemical analyser, we may be sure to be deserving of the fullest consideration. We need not, therefore, apologize for recurring to Mr. Hughes' opinions as to the tannin test of the quality of tea. The opinion he has given to our London Correspondent on the subject of the analyses of tea should therefore be well weighed by us. We, therefore, recapitulate the facts. In the *Tropical Agriculturist* for February last we published an abstract of a paper read by Mr. David Hooper on the subject of the propor-

tion of tannin in Indian and Ceylon teas, the main object of that paper being to proclaim the results obtained by analyses of high-grown and low-grown teas. We need not here enter upon the details of Mr. Hughes' references to what Mr. Hooper advanced. This has been sufficiently done in our London Letter; but the main point raised by him we think it to be desirable to offer some remarks, and to ask for fuller discussion by those interested in the subject.

Mr. Hughes' contention, as we understand it, is, that the conditions under which analyses of our teas have as yet been made have produced results which—although highly interesting in a certain sense—are practically useless as a guide to the great body of consumers of tea. These desired to be guided in their purchases, not by the outcome of what we may term "exhaustive analysis," but by that obtained by analysis performed under the conditions of general household use. Mr. Hughes thinks that the amount of tannin chemically found to be contained in teas affords no trustworthy data of what the results to household infusion may be. This infusion varies with most users only from five to ten minutes, though, as the rule we should ourselves recommend a limitation to but three minutes only provided the teapot be previously heated and the water boiling. It is contended by Mr. Hughes that what is required is that a systematic analysis of the results to infusion evidencing the proportion of tannin yielded by various teas during such brief treatment should be made to enable ordinary purchasers to decide what they would wish to buy for their household consumption. The time generally allowed by professional tea tasters for the "brew" to draw before tasting is five minutes. Probably this time might be adopted for the purpose we have referred to as being a safe medium. Ten minutes is certainly too long, while some deem three minutes too short. The medium of five, therefore, that we have suggested would probably meet the generality of tastes. Our Planters' Association has already been addressed by Mr. Hughes on this subject. It rests with that body to decide whether the course he has recommended shall be adopted by it. It certainly, for the reasons given, seems to ourselves to be one which might be with wisdom followed. To make our tea popular to the fullest possible degree we cannot take the public too much into our confidence. That public has now before it the statement that all that it has heard said about the proportions of tannin in the several varieties of tea offered to it is unreliable, in so far that it relates to conditions with which it (the public) can have nothing to do. To offer to consumers the results of analyses which *shall* afford them a guide, must surely seem to be a desirable course.

There is a second point in Mr. Hughes' communication to our London correspondent upon which we should desire to offer a few remarks in amplification of what we have in previous articles written on the subject. From what that gentleman has now and on former occasions stated, it would seem to follow that, however carefully analysis under the conditions above referred to may be made, its results must at all time be subject to the variable qualities of the water used for infusion. Our space will not admit of what we have before written on this topic being here recapitulated. We have, however, before expressed the opinion that the differences between the waters of different localities must form an important factor in forming judgment upon teas. But we were scarcely prepared to learn how highly necessary consideration of this point is deemed to be by experts at home. Mr. Hughes informs us—to quote from our London Letter—that "some London firms who do a large business in Ireland actually import Dublin water to London for the purpose of testing teas intended for Ireland." The conclusions to be drawn from this added testimony are important in considering the case upon which we have been writing. It will naturally be asked whether infusion in different waters may not altogether neutralize the results obtained from the short-time analysis of the liquors that are recommended? Indeed Mr. Hughes further tells us that in localities in England deriving their water supply from the chalk, it is found that high-grown teas meet with the most demand. Therefore conclusions based upon analysis with a single class of water will probably not hold good universally. These are matters claiming much attention. It was only lately that we criticized the variety of advice tendered to our planters by home experts; but it would seem from the facts above stated that but little else could under all the circumstances be expected. Of great value to us would therefore be some method of research which should place our procedure with regard to the growth and preparation of tea on a sound scientific basis, now apparently wholly wanting to us.

While the question of tannin is thus engaging our attention, the *Pharmaceutical Journal* of July 26th brings us interesting information in regard to the distinctive principle *theine*. Recent research, it will be seen from the extract we place below, shows that the proportion of this principle in tea is higher than was previously supposed. It is appreciably higher in "dry" than in "original" tea, meaning by the latter, no doubt, tea with the ordinary amount of moisture in it. The unnamed teas, we are unable, of course, to identify, but Ceylon dust shows well. Very strangely, however, the premier tea for theine is a 1s 2d Java tea. Cheap China and Japan show badly. It may surprise some readers to see that teas as originally received from retail dealers and brokers contained from 5·40 to 8 per cent of moisture in the first case and from 6·28 to no less than 8·98 in the second. As a rule the highest priced teas were richest in theine, the Java tea being a striking exception.

AMOUNT OF THEINE IN TEA.

BY DR. B. H. PAUL AND A. J. COWNLEY.

In the March number of the *American Journal of Pharmacy* there was a report of some results obtained by Mr. John Hamilton Small in the analysis of Japanese and other kinds of tea, according to which it was shown that the amount of theine in the Japan tea examined was from 1·79 to 2·30 per cent, while that in the samples of Chinese and Indian tea varied from 2·38 to 3·54 per cent. The method of analysis adopted by Mr. Small was that described by us in this Journal* and the results published by him are in accord with those obtained by ourselves for average tea. However, in a reference to Mr. Small's figures by a writer in a recent number of the *Apotheker Zeitung* it is remarked that the amounts of theine indicated there are "remarkably high," but that since the description of the samples analysed was given in very general terms, and there was no statement made as to the final purification of the theine obtained, further criticism was impossible. Obviously the suggestion was thus conveyed that Mr. Small's analytical results were too high, owing to impurity of the theine weighed, and the writer did not appear to have been aware of the fact that the amount of theine in tea is generally much higher than had been supposed on the bases of the older analyses which were made by methods unsuited for the complete extraction of theine in a pure state. We have, therefore, made a further series of analyses of different kinds of tea for the purpose of obtaining additional evidence as to the amount of

* *Pharmaceutical Journal*, Nov. 19th, 1887.

theine, and it will be seen from the following table that the conclusion we had previously arrived at as to the presence of theine in greater proportion than had been assumed is fully sustained by the analytical data there given.

	TEA.	Price.	Mois-ture. p. c.	Theine. Original Tea p. c.	Theine. Dry Tea p. c.
		Retail.			
29	... ...	2s 4d	7·60	3·54	3·83
30	... ...	2s	6·75	3·66	3·93
31	... ...	1s 6d	6·20	3·12	3·32
32	... ...	1s 6d	6·60	3·06	3·27
33	... ...	1s 4d	5·40	3·42	3·61
34	... ...	1s 8d	8·00	2·82	3·06
35	... ...	1s 4d	6·60	2·74	2·93
36	... ...	1s 6d	7·40	2·92	3·15
37	Ceylon dust ...	—	8·00	3·58	3·89
		Broker.			
38	China	1s 3d	8·60	3·46	3·78
39	,, ...	11¼d	8·40	3·32	3·63
40	,, ...	7d	8·60	3·20	3·50
41	,, ...	4½d	8·98	2·20	2·42
42	Japan Congou ...	7d	6·42	2·74	2·93
43	,, ,, ...	5¼d	6·28	2·72	2·90
44	,, ,, ...	5d	7·64	2·58	2·79
45	,, ,, ...	4½d	6·92	2·42	2·60
46	Java Pekoe Fl'y ...	1s 7½d	7·34	3·16	3·41
47	,, ,, ...	1s 2d	7·92	3·78	4·10
48	,, ,, S'chong...	11d	7·04	2·94	3·16

CRYPTOMERIA JAPONICA.

This timber tree which has flourished in and around Darjeeling at 7,000 feet and down to 3,000, ever since FORTUNE, nearly sixty years ago, brought the seeds from China, has been planted to a considerable extent in and around Nuwara Eliya. Dr. Trimen has expressed a fear lest the climate of our hills should be too wet for this tree; but in the latest report of the Royal Botanic Gardens, we have Mr. Nock's testimony regarding a specimen cut down at Hakgala, when only sixteen years old. It yielded 90 feet of 1 inch boards, measuring in width 16 inches at bottom to 6 inches at top. This is surely an encouraging result, considering the age of the tree, and until now all the accounts we have received of the Japan pine have been largely favourable. Mr. W. R. Tringham, of Nuwara Eliya, however, sends us the following extract to "show that the tree is not of such rapid or big growth, or the timber of such value, as was supposed":—

(Extract Notes upon Useful Japanese Timber, by J. N. T. Turner, A. M. I. C. E.)

The Sugi (*Cryptomeria japonica*) has a coarse fibre, and the annual rings of growth are distinctly marked. The heart-wood is ruddy brown, and the sap-wood straw colour. It is a feeble and perishable timber; but being very straight grained, it opposes considerable resistance to longitudinal stress. This property renders sugi a useful timber for uprights in houses of light construction; though it is most extensively employed in the characteristic scaffoldings of the country. For timber, the felling age is about 35 years, when the average girth is 3 to 4 feet; but for poles it is felled much younger. When full grown, a girth of 15 feet is not uncommonly attained. The present price is 25 sen, or 9d per cubic foot.

All the above timbers are inferior in strength to their European analogues, as they are, under the climatic conditions of Japan, of more rapid and exuberant growth. The trees are generally felled long before their full growth has been attained. Felling is carried on through all seasons, the summer months being the favourite &c. &c.

Taken from minutes of proceedings of the Institution of Civil Engineers, vol. 89, issued July 1887.

What is above stated, if accepted fully, does not disprove the value of the tree as yielding fuel from its prunings and thinnings, and timber suitable for tea boxes and packing cases and for such indoor work as ceilings and posts of houses and like purposes. We saw Mr. Nock's planks and they seemed to us to be equal to good fir or spruce fir deals. It seems probable that a twenty-year old tree in Ceylon may be equal to one of thirty years' growth in Japan. If grown extensively, it might yield soft wood railway sleepers which could be creosoted, vulcanized, or otherwise preserved locally. Gamble, in his Manual of Indian Timber Trees, writes of a specimen of the wood from Darjiling, "wood soft, white, with a brown, often almost black heartwood. Very uniform, with narrow bands of firmer and darker tissue at the edge of each annual ring. Medullary rays short, fine and very fine, extremely numerous." Of the tree he says: "*Its growth is extremely rapid*: One specimen shows an average of 1·2 ring per inch of radius, and many of the rings are one inch wide. * * It is brittle and the tops and branches are broken by high winds." Close planting may protect the trees from such misadventure. Von Muller gives a very favourable account of the trees thus:—

The Sugi or Japanese Cedar. Japan and Northern China. The largest tree in Japan, the trunk attaining 35 feet in circumference (Rein) and 120 feet in height. Stem long, clear, of perfect straightness; the plant is also grown for hedges; in Japan it yields the most esteemed timber, scented like that of Cedrela (Christie). It requires forest-valleys for successful growth. The wood is durable, compact, soft and easy to work; more extensively utilised in Japan than any other. In the Azores the tree is preferred even to the Pinus Halepensis for timber-culture, on account of its still more rapid growth in that insular climate. Several garden-varieties exist.

It would thus appear that the tree (which is easily propagated from seed or cuttings) is valuable in many respects and for various purposes. Teak, about the best timber in the world, if tested by the breaking weight strain, compares very poorly with Australian iron and stringy bark timber. But teak is still the superior timber, one of its merits being that it is easily worked. That is also one of the merits of *C. japonica*, and its perishableness in Japan may be due to the fact that the timber is not properly seasoned. It is curious that a tree which grows to a height of 120 feet and a circumference of 35 feet should be capable of being treated as a hedge plant. But the Japanese are great in the art of dwarfing vegetation.

CATTLE AND CATTLE DISEASE IN CEYLON.

Nothing could be more appropriate to the discussion of this question than the appearance of the amended Ordinance relating to Village Communities. Here we find, as we anticipated, that the native tribunals and committees are vested with very large powers for the repression of cattle trespass, cattle stealing and cattle disease. All that is needed is that the natives, to whom so large a degree of self-government has been conceded, should, under the judicious guidance of the Government Agents and their Assistants, use the powers entrusted to them wisely, actively and courageously, without fear or favour. They can make such rules as they deem expedient for places for the slaughter of cattle, sheep or swine, for taking care of waste and other lands set apart for the purpose of the pasturage of cattle or for any other common purpose; and for breeding, registering and branding cattle, for regulating the sale, removal and slaughtering of cattle, and for preventing catte trespass, *cattle disease* and cattle stealing. The gansabhawa courts, too, in their criminal jurisdiction can deal with cases of cattle trespass under the Ordinance No. 9 of 1876. Wide powers are thus given to the natives to deal

with matters so deeply affecting their interests as the breeding and tending of cattle, measures for the prevention of disease and for its limitation and cure, when it has appeared. All that is wanted, we repeat, is that the powers vested in the people should be intelligently used by them for their own good. Government will, of course, see to it that while the Forest officers are demarcating reserve forests and repressing wasteful chenaing, a sufficient area of ground is left in connection with villages for purposes of common pasture. On such commons those interested ought to be compelled to bestow labour in clearing the ground of jungle and weeds, so giving the nutritious grasses fair play in the struggle for existence of various forms of vegetation. This measure alone will in most cases suffice, in ordinary seasons, to secure good pasturage on high lands, while water grass can be cultivated on portions of swampy land to which village labour ought to be applied for drainage purposes. The breaking up of cabook (laterite) by means of mamoties, or the application of a small quantity of good cabook as a top dressing to sandy or inferior soil, has an excellent effect. The late Dr. Thwaites of the Peradeniya Gardens, in the paper to which we have already referred as contained in the appendix to the report of 1869, stated:—

Taking into consideration the secondary interest, as compared with his paddy fields, which the native cultivator appears to take in his cattle,—these being allowed to roam about, to pick up food where they can find it—on paddy fields when the crop is off, on the sides of roads, and on scrubby chena lands,—without any attempt, so far as I have observed, to keep them in fenced-in pastures, or to improve the pastures by freeing them from weeds,—I hardly see what better step, as a preliminary one, can be resorted to, than to endeavour to induce the villagers to increase the extent of their pasturage by converting into grass land large areas of chena, which are now covered with lantana and other comparatively useless vegetation. The park-like portion of the Peradeniya garden has been formed by merely keeping cleared ground free from weeds, allowing any grass plants that shewed themselves to remain. After a few weedings the latter became so numerous by spontaneous growth (no seeds being artificially sown) that a fine grass-sward, on which cattle thrive well, is produced. The subsequent weedings which are necessary to keep it clean, are effected with a very trifling expenditure of labour. If arrangements could be organised for a similar process of clearing and weeding certain portions of the waste lands throughout the Island by village communities, who might be allowed to pasture their cattle, on certain conditions, upon such cleared land, an important addition would be made to the wealth of the Island, and, it may certainly be added to the beauty of its scenery.

Were systematic cattle rearing a more prominent part of the industrial occupations of the native population, more attention would doubtless be directed to the providing food for their cattle during the dry season, and in sufficient amount to meet any exceptionally long rainless period that might occur. Paddy straw appears to be a capital fodder, and to be extensively used as such. It is probable that some of the coarser grasses of the Island, which on account of their harshness in a fresh state are then unpalatable to cattle, might if dried into hay and then chopped or pounded, be found capable of furnishing nutritious fodder for cattle. Clearing away the small vegetation from the banks of rivers and streams, and planting them with Mauritius grass would be a most useful proceeding in very many parts of the Island.

As a tropical country, Ceylon is highly favoured in the amount of its grass land, and in the quality of many of its indigenous grasses. A superior description of pasture might no doubt be produced by sowing upon cleared land seeds of the most nutritious species of grass collected for the purpose. It would also be desirable to procure if possible, seeds of esteemed tropical grasses which we do not already possess, to be used for a similar purpose.

It must be borne in mind that for different zones of elevation different species of grass would, respectively be found to be best adapted; and the same would apply to differences of climate as respects excessive dryness or superabundant moisture. Investigation and experiments therefore, if thought desirable to be made in this direction, would have to be carried on in various localities in the Island, and with different kinds of grasses.

On the cleared pasture grounds of these gardens (without the addition of any other food) with Sinhalese and Coast varieties of cattle thrive exceedingly well, bringing forth strong and healthy calves, and yielding milk and butter of good quality. Very little attention is required to prevent ill effects arising to young calves from the bites of leeches. It is true that sheep cannot easily be pastured where leeches abound, owing to the leech-bites becoming fly-blown, and in this way incurable sores are frequently produced; but this particular obstacle to the breeding of sheep would hardly obtain in the drier parts of the Island.

Here we have the necessary measures for securing good pasturage and forage indicated. The one thing wanting is that the natives should voluntarily or under benevolent compulsion, bestow labour on the preparation and conservation of pasturage for their cattle instead of allowing the wretched animals to wander through jungles and swamps or fallow paddy-fields, picking up a scanty and precarious subsistence. It is gross exaggeration to describe the soil of Ceylon as "poor in the extreme." It varies, of course; but everywhere, if weeded and kept free of useless or noisome vegetation, it is capable, under the influence of our tropic sun and our tropic rains, of yielding very fair pasturage. The recommendations in the report of 1869 as regards food for cattle were as follows:—

Believing that the cattle of this country suffer greatly from the want of good and sufficient grazing during seasons of drought, and from exposture in their search for food in the rainy months, we would suggest the desirability of inducing village cattle owners to husband their paddy straw under shelter, to serve as fodder for their animals during the inclement seasons of each monsoon, as there can be no doubt that their herds would be much benefited by stall-feeding during such periods.

Mauritius grass dried and stored against seasons of prolonged drought or excessive rain, would form an admirable adjunct to paddy straw for purposes of stall-feeding, and we strongly urge its introduction into the rural districts of the country. It is a grass easily acclimatised, requiring no cultivation and of rapid growth, and it would be well suited for ravines in the hill districts and for swampy ground in the low country. The slight trouble involved in protecting it by fence or ditch from destruction by wild cattle would be amply compensated for in the valuable supply of excellent dry fodder it would afford, whilst the manure that would be accumulated in the cattle stalls at such times, could be employed in aiding the fertility of adjacent paddy lands, a matter to which native cultivators have hitherto paid far too little attention.

We believe that the "Prairie Grass" of Australia is also well suited to the climate of this country, and might be extensively introduced in pastoral districts with great advantage. It is a very hardy perennial,* grows to a great height if left uncut, and when grazed over makes a fine compact and enduring sward, capable of withstanding the effects of severe droughts. The grass is now being successfully grown on the Company's Farm at Peradeniya.

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* "Prairie Grass."—This most valuable plant has become well and favorably known; it is a very hardy variety, stands drought as well as if not better than any other grasses, can be kept constantly under the scythe, and is well relished by all kinds of stock. It is most valuable to squatters, who by sowing a few bushels broadcast over their runs well secure a most permanent grass. The quantity required per acre is about two or three bushels.—*Melbourne Circular*, 1869.

With a view to providing better and more extended grazing in certain localities, such for instance as in the Badulla, Hambantota and Matara districts, we would suggest that a sufficiency of Crown chena land in the vicinity of each village or group of villages be set apart for this purpose, and the cultivators allowed to clear it from underwood, leaving only a few of the larger trees for light shade: beneath these, if the ground be kept free from undergrowth and weeds, good nutritious grazing could soon be obtained, which would be available for cattle in seasons when the grass on the lower and more exposed lands would be parched and burnt up?*

It would no doubt be very desirable if some of the European roots employed for cattle feeding could be introduced into this country, for stall-feeding during seasons when the ordinary grazing failed. Mangold Wurzel has been grown at Peradeniya with complete success, and, contrary to expectation, it has been found that this root is not attacked by pigs, or rats, which swarm in abundance on the land on which it was produced. The question of its preservation after digging, during certain seasons of the year, would soon be determined by a few experiments.

In reperusing the papers on the Grasses of Ceylon, contributed by the late Mr. Wm. Ferguson to the Journal of our local Asiatic Society, in 1880, we are simply amazed to see what a wealth of plants, indigenous and introduced, is available for cattle and horse food, if they were only properly treated and cultivated. Our attention is first attracted to *Hygroryza aristata*, which grows floating on water, and is a grass of which, according to Roxburgh, cattle are fond. This grass and others of a like habit, of which many are enumerated, might be encouraged to grow on the undrained water-covered swamps which occupy so large an area in the lowcountry extending inland from Colombo, along the route of the railway and by the sides of the Kelani river. *Coix-gigantea*, "kirindi mana" of the Sinhalese, although a tall coarse grass is freely eaten by cattle. *Paspalum scrobiculatum* in its wild state is common from the seashore to Nuwara Eliya, and cattle are very fond of it, whether green or dry. *Panicum sanguinale* is one of the most abundant grasses in the island. Cattle are fond of it and it forms one of our common pasture grasses. Of *P. ciliare* cattle are very fond. *P. javacuium* is greedily eaten by cattle. Of *P. Burmani* it is recorded:—

This is the Pagister grass, and Scotch grass of the West Indies. Writing about Jamaica, Loudon in his Encyclopædia of Agri. alludes to this grass as follows:— The island abounds also with different kinds of grass, of excellent quality, the artificial grass called Scot's Grass (Panicum hirtellum, fig 199, a. p. 195) grows spontaneously in most of the swamps and morasses of the West Indies; and it is so productive, that a single acre of it will maintain five horses for a whole year.

P. Crus-galli, cultivated as a millet, grows wild as a grass, of which cattle are fond. So with *P. fluitans*, which floats on water and grows on the edges of sheets of water. Of *P. distachyum* and *P. prostratum* cattle are fond. *P. trigonum* is very abundant from the seashore to several thousand feet elevattion, and forms with *P. ovalifolicum* and *P. curvatum* the principal part of the fodder collected by he grass-women for horses in the Cinnamon Gardens. Of *P. repens*, "ætora tana" of the Sinhalese, it is said:—

This is one of the most common grasses in the island, and highly valued as fodder for cattle, large quantities of it being brought into and sold in Colombo. It is indigenous to Europe, Africa, Asia and America, and in Ceylon grows equally well in the dry sandy soil as it does in marshes, or water, its long creeping underground stems enabling it to endure the hot dry weather. It is one of the most difficult plants to get rid of once it establishes itself in any locality, and in this respect resembles the Triticum repens of Europe. It is found from the sea coast up to Nuwara Eliya, and is a common weed on some coffee estates.

Of another grass it is written:—

Roxburgh states that the *P. paludosum* is of a coarse nature and that cattle are not fond of it, but it is eaten greedily by them, and a supply of specimens collected by me for the Peradeniya Gardens was eaten during the night by a stray bullock.

Of *P. myurus* it is said:—

This is a very in grass found in the edges of canals or growing in the water with large swollen culms, and light green foliage. Cattle are fond of it. It is one of the grasses which rapidly spreads over shallow bits of water and helps to choke them up.

Cattle also eat *P. interruptum*, *P. asperum* and *P. sordidum*.

We now come to the very best of our introduced and cultivated grasses, *P. jumentorum*, of which we are told:—

This is the famous *Guinea Grass* so well-known in the West Indies, in India and Ceylon. It is the Rata (foreign) Tana of the Sinhalese. When and by whom it was introduced to Ceylon I find no record, though it is probable there may be one in the Royal Gardens at Peradeniya. It was grown in Ceylon in Moon's time, 1824, at any rate. The late Dr. Gardner introduced the seed of what he supposed to be a new fodder grass to Ceylon, but in 1843 or 4, he gave a full description of it in the *Ceylon Observer*, proving that it was identical with the Guinea Grass. It was introduced to Jamaica about 1744, from the Coast of Guinea. The following is an extract from Lunau's Hortus Jamaicensis:—

This most valuable grass is a native of Africa, and was introduced into the island many years ago by the merest accident. Mr. John Ellis got some birds from the coast of Guinea, and with them some seeds for their support: the birds dying soon after, the seeds were thrown out of doors as useless. From these seeds grew some luxuriant grass, which attracted Mr. Ellis's notice, and he had a horse and a cow brought where it was, when both of them greedily ate of it. It was then transplanted into a garden and gradually cultivated, until it has become one of the most lucrative and useful plants in Jamaica. It agrees with almost every soil and situation, and has rendered many rocky and otherwise barren spots of Jamaica very valuable, as affording support to herds of cattle and horses. The growth of this grass is quick, for in wet weather, and in a favourable situation, it may be cut once in a fortnight. It resists dry weather for a considerable time, and even, when parched up, the slightest shower will revive it. It rises from five to eight feet high. When of proper strength it is a very excellent food for horses and cattle, which, when considerably lean and reduced, wil be restored to flesh and fatness in two or three months by feeding upon it.

There can be no doubt that the Guinea Grass, and what is most erroneously called in Ceylon *Mauritius Grass*, are the two most valuable fodder plants growing in Ceylon.—I have seen the Guinea Grass grow in what seems to be the pure white sand of the Cinnamon Gardens near Colombo, to a height of 6 to 8 feet, and if well manured and kept free of weeds, it will in rainy weather give a very fair crop monthly. It grows freely up to an elevation of 5,000 to 6,000 feet on the Coffee estates, but though a valuable fodder grass at these elevations, it does not grow to such a height as it does at lower elevations. It is extensively planted along the edges of foot and bridle paths on Coffee estates, but Mr. Morris gave his opinion against this practice, as the grass is supposed to harbour the mycelium of the Coffee leaf fungus.

When coffee flourished, the paths of many estates were, as Mr. W. Ferguson indicated, defined by this grass. But it attracted numerous hares which proved destructive, and when the bad times for coffee came and it was proved that manure merely encouraged leaf-disease and white grub, the expensive culture of Guinea grass was very generally abandoned.

* See letter from the Director of the Botanical Gardens, Appendix, p. 70.

Next comes the grass which is even of more importance than Guinea grass, inasmuch as it is, though not so saccharine or nutritious, far more easily cultivated, growing readily in swampy lands in the lowcountry and in ravines on estates amongst the hills. Like all vegetation which is frequently cropped, this "Mauritius" or "water grass" requires to be liberally manured. Its cultivation in the swampy parts of the Cinnamon Gardens and in and around Colombo generally has now attained dimensions of very considerable magnitude, bundles of the grass being carried about in carts and sold as fodder for cattle and horses. Its history as recorded by Mr. W. Ferguson is very curious, thus :—

Panicum barbinode Trin. Sp. Gr. 3 t. 318. P. sarmentosnm, Rox. fl-ind. I. p. 308. This is the grass so well known, but very erroneously, as *Mauritius Grass.* It is not given in Bojer's Hortus Mauritianus dated 1837, and Moon does not give it a place in his Catalogue dated 1824. By whom and when introduced to Ceylon I do not know.—It has been a well known fodder grass for several years past, grown in ravines and on the sides of streams in Coffee estates, but in Colombo the cultivation and supply of this grass were nearly confined to the Firm of Wilson, Ritchie & Co., until their failure some years ago, when the natives, Tamil and Sinhalese, began to cultivate it extensively and now supply Colombo with this most useful grass. Unlike the Guinea Grass, this one grows best in swampy or low grounds, but which must be well drained and manured to produce good crops. The owners of Mauritius Grass fields near Colombo send their carts into town and carry out a large portion of its scavenging refuse as manure for this grass, and a very considerable trade is carried on by the sale of this and Guinea Grass in Colombo.

Trinius gives Brazil as its native place, but as far as I know Roxburgh's description is the first given of this grass, and that it originally came to the Botanical Gardens at Calcutta from Sumatra upwards of seventy years ago there can be no doubt, though I notice that it is referred to by one Botanist as a native of Behar and the mountains of Parasnath. That it has spread from the Calcutta gardens to the various places in which it is now cultivated is very likely. Roxbourgh's account of its introduction is as follows:—"A native of Sumatra, and from thence introduced by Dr. Charles Campbell into the Botanic Garden in 1804, where it grows luxuriantly and blossoms throughout the year."

Of *Pencillaria spicata* the record is :—

Introduced from India to Ceylon many years ago. This plant is extensively cultivated in various parts of India and Egypt, and is said to be the staff of life in the Deccan, Kandeish and Gujarat. It is grown by the Tamils in Ceylon and springs up in rubbish heaps about Colombo. Its grain is so like Canary seed, that it is sold as such, and small birds seem to thrive on it. The late Dr. Elliott used it in feeding Carrier Pigeons, so successfully employed in carrying news from Galle to Colombo for many years before the telegraph was introduced. Cattle are fond of the straw.

Of *Stenotaphrum complanatum* it is stated :—

Mr. Moore, of the Sydney Botanic Gardens, told me that this was the *Kangaroo Grass* of Australia, but that is generally given as the Anthistiria australis and now said to be identical with the A. ciliata Retz. The Stenotaphrum is a very common grass near Colombo covering moist banks and sometimes forming the entire sward of lands on the banks of rivers and under the shade of coconut and other trees. It is an excellent fodder grass and cattle are fond of it.

Arundinella nervosa is one of the poor patana grasses we referred to. Of it we are told :—

This is a very common grass in the Patnas in the higher ranges, but I do not think cattle care for it, though when cut and dry amongst other grasses it forms a good fodder.

Apluda aristata when cut and dried amongst other grasses is a good fodder. Of *Ischœmum muticum* we are told :—

Large quantities of this grass are collected by the grass women for horse food in Colombo, but it is a coarse fodder.

Spodiopogon obliquivalvis is one of the most important of our native grasses, and of it we have a full record :—

Common throughout the island. A very variable plant, and the extreme forms of it very different in appearance, but, from the examination of a large number of specimens, I feel satisfied they may be safely arranged under one specific name. The larger hairy form occurs at a considerable elevation on the hills.

One form of this grass reserved in fields and under the shade of coconut trees in and near Colombo, and extensively brought into town as fodder for cattle, is well known as the Rat-tana, literally red grass, of the Sinhalese. This grass, the Ætora (Panicum repens, Lin.), Guinea, and Mauritius grasses, are the four grasses sold separately in cart loads as fodder grasses in Colombo, and perhaps the best known to the natives. I am quite familiar with several forms of this grass from the dry sand of the Cinnamon Gardens in Colombo up to an elevation of 6,000 feet in the plain of Nuwara Eliya, and if all these are one species it may be considered one of the most protean of grasses in existence as far as I know.

Details are given of the varieties, and of one it is said :—

It affects damp shady places from the coast up to the Kandyan country, and is very seldom found in flower. It is an excellent and abundant fodder.

We now come to the principal grass of our upland prairies or patanas, *Anthisteria ciliata*, regarding which we quote as follows :—

This is a very abundant grass in many parts of Ceylon but especially in the patnas in Upper Dimbula, in many of which it is the principal grass, and is often cut and dried for fodder for cattle. This was especially done by Mr. William Smith on the patnas near the group of estates at Mattakellie. It is perhaps in this respect the best substitute for hay of all the grasses found in Ceylon. Several years ago large quantities of this grass used to come from Bombay with batches of horses for sale. In the Bombay Flora, Dalzell states that this species, and A. cymbaria, Rox. are generally found together in the same field ; and that they form the greater part of the best specimens of hay in the country, whilst he thought that the A. ciliatus, which is also a native of South Africa, differed scarcely, if at all, from the famous Kangaroo Grass of New Holland the A. australis of Brown. I notice that Mr. Morris refers to the A. australis having been introduced to Ceylon as a distinct species from A. ciliata, but the following extract from Baron Ferd. Von Mueller's Introduction to the Botanic Teachings of the Schools of Victoria, p. 125, show that this eminent Botanist considers the Kangaroo Grass identical with A. ciliata :—"Every one is acquainted with our Kangaroo Grass (Anthistiria ciliata), long known before Australia became colonised in South Asia, and all Africa. Why the younger Linne should have connected the flower-festival of Bacchus with this plant, if really the name was changed from Authesteria, is difficult to conceive."

Another, but a creeping patana grass is *Anthistiria heteroclita*, "an excellent fodder in a green or dried state."

We now come to the citrus-scented, great and prevalent grass of the patanas, known as *mana.* Its scientific name is *Andropogon martini*, and Mr. W. Ferguson gave the following details regarding it :—

I refer here to the best known and most remarkable grass in Ceylon, which covers thousands of acres of the patnas of the interior of the island up to 5,000 feet altitude, and which are supposed to have resisted the encroachment of the forests upon them time out of mind. The Rev. Mr. Abbay, the late Mr. Nietner and others have written fully on these patnas, and their soil. In the open exposed patnas it grows to a height of 6 to 7 feet, but in moist shaded places and amongst trees and small clumps of jungle it grows tall enough to conceal

elephants. It is used extensively as thatch for coolie lines and other buildings where to be had, and for this purpose and for litter for cattle is grown on some estates. It is grown in several portions of the Western Province on the embankments of ditches as a sort of fence. Cattle eat this grass when it is young, and for this purpose the patnas on which the natives graze their cattle are annually burnt, but the milk, butter, and even the flesh of cattle fed on it have a peculiar aromatic flavor. The following remarks by General Martin who sent Dr. Roxburgh the grass from Balaghant named after him is applicable to our Ceylon one, if the grasses are not the same species. "I took particular notice of a sort of long grass which the cattle were voraciously fond of, which is of so strong an aromatic and pungent taste, that the flesh of the animals, as also the milk and the butter, have a very strong scent of it." I keep this separate in the meantime from the Citronella Grass, and what is called Lemon Grass in Ceylon.

We may add that mana-grass has been very largely used on estates to cover nursery seed beds, also as bedding for cattle, and now a new interest attaches to the product from the prospect of its being utilized as "strawboard" for the manufacture of tea boxes, in regard to which we have a separate article in type.

Andropogon pertusus "is an excellent fodder either in a green or dry state and cattle are very fond of it." Again we have a notice of one of our best native grasses in *Cynodon dactylon*, of which we are told :—

This is the famous *Huryalee* of the Deccan, and the *Arugam-pillu* of the Tamils in Southern India and Ceylon. It is the grass supposed to be the best fodder of the indigenous ones, and is invariably selected by the grass women who may be seen all over Colombo scraping the whole plant from the roadsides and swards, to the very great injury of both, as it is one of the best grasses for binding the roadsides, and for forming swards. It is quite common everywhere in Ceylon, from the sea-coast up to the plains of Nuwara Eliya. It is the Panicum Dactylon, Linn., Agrostis linearis, Retz. and has been described under about a dozen other names. It seems to be common over a great part of the world. It is found in England, and other parts of Europe, India, China, Thibet, Australia, South and Central America, and the Cape of Good Hope, and said to have been introduced into Farz and Khuzistan, by the British Expedition of 1856-7, according to Birdwood p. 126. Col. Otley has written fully on the cultivation of this grass as a fodder for cavalry, in the Madras Literary Journal, but some trials made by me near Colombo did not bear out the Colonel's recommendation. It is the Durva, Sans. Doorba, Doobla, Beng. Doob, Ganer, Hind, and Gherika. Tel. "It is the Agrostis of the Greeks according to Fraas. Its flowers in their perfect state are among the loveliest objects in the vegetable world, and appear, through a lens, like minute rubies and emeralds in constant motion from the least breath of air. It is the sweetest and most nutritious pasture for cattle; and its usefulness added to its beauty, induced the *Hindus*, in their earliest ages, to believe that it was the mansion of a benevolent nymph. Even the veda celebrates it, as in the following text of the *A't'harvana*: "May Durva, which rose from the water of life, which has a hundred roots and a hundred stems, efface a hundred of my sins, and prolong my existence on earth for a hundred years."

Other grasses are mentioned, but we have quoted sufficient to show that Ceylon possesses, besides the straw of paddy and other grain, an abundance of fodder grasses, suited for "dry" and "wet" cultivation; so that, with industry and care, provision could be made for periods of drought as well as normal seasons. Besides the *gramineæ*, wild and cultivated, there are other fodder substances, such as sugarcane tops, manioc and other roots, and the very valuable foliage of the jak tree. Then in the higher mountain regions there is the small, dense-growing bamboo of the forests which when properly treated is eaten by horses. The gorse or furze (the "whins" of the Scotch) flourishes in Nuwara Eliya; and a Highland gentleman who visited Ceylon some years ago suggested that this apparently most unpromising of plants might be made a source of fodder. In the Scotch Highlands expanses of whins are fired as the patanas are here, and while the shoots which spring up are still tender, they are cut, carted to the farmers' barns, and after being subjected to a thorough *flailing*, the bruised and juicy stuff is fed to horses and cattle. We mention this as a matter more of curiosity than of probable practical value; but there can be no question that, even apart from the possibly successful cultivation of such fodder substances as clover, rye-grass, lucerne, mangolds and the like, there is a large choice of grasses and other plants, native and introduced in Ceylon, to keep cattle in good condition (not to speak of coconut and gingelly cake and cotton seed), were the available resources only utilized with conscientious, steady industry. The problem is how to create and bring into operation these moral qualities amongst the natives. Government cannot do the work of the Christian Missionary; and after thousands of years of debasement we cannot expect that the regeneration of the people will be other than a comparatively slow process. But Government can do a good deal by legislation, and has done and is doing much that is useful and good by industrial education and by training and scattering agricultural instructors over the land. But individual servants of Government (especially those of European origin) can further the march of agricultural and pastoral improvement indefinitely, by personal zeal and interest, by encouragement and moral suasion, and occasionally by benevolent coercion.

Before parting with the report of 1869, there are a few details of interest to which we may advert. The idea with a large proportion of Europeans is that the whole population of India are vegetarians, or that they confine their consumption of animal products to milk, ghee and curds. Europeans in India, however, know that the masses—the millions of Hindustan—are only too ready to eat all the flesh they can get hold of, including that of swine, and without fastidiousness as to the condition of the meat. The Report noticed the spread of murrain in Ceylon by the habit of the natives digging up and carrying away for consumption the flesh of animals which had died of disease and had been buried, instead of being burnt or chemically consumeds The lower caste Tamil coolies are special offenders in this respect and so common did this offence become at one time in Southern India that Missionaries of the American Presbyterian Church (sons of Dr. Scudder, so well-known in Ceylon) considered it their duty to regard the digging up and eating of diseased and putrid bodies of cattle as an ecclesiastical offence, of which if native Christians were proved to be guilty they were excluded from the Church. We are not aware whether our penal code or common law provides for the punishment of this offence against nature and the commonwealth, but punished it certainly ought to be. The difficulty of coping with the evil of cattle disease is shown by the statement that "in nine cases out of ten it will be found perfectly useless to expect that any directions as to food, cleanliness or the administration of medicines will be properly carried out, except under the immediate eye of a person of intelligence." Until the intelligence desiderated is far more prevalent than it now is the difficulty of coping with disease and the conditions which lead to it will remain. When there is an outbreak of true rinderpest amongst cattle

here or anywhere else, the proportion of deaths of seizures are as nearly as possible the same as amongst human beings when Asiatic cholera becomes epidemic; that is, three-fourths and more of the earlier cases are fatal. Hence the value not so much of treatment, as of preventive measures, in the shape of nutritious food, shelter, especially at night, cleanliness and the free use of such disinfectants as carbolic acid and other chemicals. The following is characteristic:—

On the Arachchi [in the Matara district,] being questioned as to the reason why garden cultivation was nowhere attempted, he replied that the want of water prevented any cultivation of this kind. He was reminded that in Jaffna, where less rain fell than here, a most thriving agriculture was carried on by means of well water. He remarked that such was not the custom here, and there was no one to show the people who to proceed in such a matter. To the question why did not the Headmen instruct the villagers in this, the characteristic reply was, "The Government had not given orders."

Again:—

A circumstance occurred here which illustates very forcibly the peculiarity of native character. The owner of one of the sick calves, a woman, had besought the assistance of the Commission for the sick animal with an importunity that showed her deep concern for it; as she said, she regarded it as one of her children. The utmost attention and deference was paid to the Commission: chairs were placed on a mat in front of the house, and coconuts were brought out in profusion. On returning from Dikwella and calling at this house, the woman peeped out of the door with a vacant stare, but no signs of recognition, and resumed her occupation: the eldest son lay stretched at full length on his back in the front verandah; hearing footsteps he turned half around, grunted, and resumed his former position, taking no need of any one. We knew by these infallible tokens that the calf was quite well, and so it proved. It was beyond all danger, and the Commission was no longer an object of civility to its owners!

The difficulty of obtaining correct information from the natives here and in India, even when a census has to be taken, from their inveterate belief that all inquiries are made with a view to fresh or enhanced taxation, is curiously illustrated in the following passage:—

An extensive cultivator, from whom some information was being obtained in regard to herds and agriculture, enquired when the new tax on cattle was to be levied, and how much was intended to be charged. On his being assured that no tax was contemplated, he enquired why Government was so anxious to ascertain the number of cattle in each district and village if not for the purpose of taxation, and listened with evident incredulity to the explanation that the information sought was for no other purpose than as a guide to the extent of losses suffered by the people in this respect, and as an indication of the necessity for some measures being adopted to prevent the spread of the disease. When reminded that the Government had undertaken an enquiry into Cattle Disease at the public cost, the rejoinder was that no doubt the new tax would pay for the Commission.

The opinions of the late Mr. R. B. Tytler, who kept fine herds of "Coast" cattle at Pallikelle, were thus delivered:—

Murrian of a variety of types may be looked for after every cycle of drought when succeeded by wet years and nothing I can think of can be done to prevent or alleviate it, beyond housing, separation of the attacked, dry warmth, good dry food, rock salt, scrupulous cleanliness, and such care as common sense dictates; all these would doubtless be beneficial, but will the people attend to it?

The commonsense of the whole matter was thus summed up by Mr. E. J. Browne of Melfort estate:—

So far as I have been able to judge, well-fed and carefully tended cattle do not appear to be so liable to the disease. Were cattle kept in good condition, and occasionally well groomed with a curry comb. and brush, and above all kept *warm* and *dry* at night with a sufficiency of bedding, the cases of murrain in a herd, would, I believe, be reduced to a minimum. A fruitful cause of disease is the practice which native cattleowners have, by tying up their bullocks in the open air at night, wet or dry, without food or bedding; and then after over-working them the following day, turning them out into poor patna grass, where they eat ravenously the unwholesome food to be found there. "Prevention is better than cure," and good food, plenty of water, housing in warm and dry sheds in bad weather, and cleanliness, will do more to arrest the cattle disease than all the specifics that have yet been discovered.

The late Dr. Thwaites (the well-known medical man, and not to be confounded with the botanist) contributed a paper on cattle disease in which he wrote:—

'Dr. Ferguson suggests large doses of Quinine, I understand, and, no doubt were Quinine accessible to the natives, even conveniently available to the Planters, in such large doses as Cattle would require, it would certainly be the best constitutional remedy we could propose; but we must look elsewhere for our resources among the remedies with which the natives are familiar, and which are not within their reach, and such as they would feel disposed from their own prejudices to employ. The Alkaloid preparation, termed Peperin, derived from common pepper is now attracting great attention at home, as a substitute for Quinine as a tonic and stimulant, being equal to it in efficacy and immeasurably cheaper. The natives are perfectly conversant with the use of Black Pepper as a febrifuge, and I have often employed it myself among them with great advantage. I would therefore suggest the following prescription.

"Whole Pepper well reduced to a powder one table-spoonful, *boiling* water one pint, to be well mixed and allowed to stand for half and hour, then given all together, and repeated every two hours until the Fever subsides.

The reference to Dr. Fergusson, as he spelled his name, then head of the Medical Department, arose from the fact that the present writer, as editor of the *Observer*, had recommended the use of quinine in cattle disease. There can be no question of the value of cinchona alkaloids as tonics and febrifuges, in the treatment of the lower animals as well as human beings, and now that those remedies can be obtained at so low a cost, we repeat the recommendation with more confidence than ever; that is where the symptoms are manageable debility or feverishness.—A passage from a report on murrain in the Matara district, by Mr. E. Elliott, may well be quoted. He recommended:—

The enforcement of more attention to the cattle by their owners, if not for their own sake, for that of the proprietors of other property, especially growing crops. A good deal of attention is paid to black cattle in the Gangaboda Pattu, where they are regularly tethered out whenever there is any cultivation likely to attract them in the neighbourhood. But in the other parts of the district very little trouble is bestowed on them; this is the case nearly everywhere in the Island, except in the Jaffna Peninsula and in the Wanny and Tamankadoowa, where the animals are driven home and tied up or kraaled for the night to protect them from the ravages of wild animals. One Mudaliyar here reports that he does not believe there is a single animal in his Pattu which has not done damage worth several times its own value.

There is much else of interest which might be quoted or noticed, but we have already dealt with the subject at such length, that here we must close, —at least for the present. We have done our best to summarize the information available; and if legislation is really resorted to it will be our duty to examine the regulations, imposive or prohibitory, which may be proposed.

THE PLANTING ENTERPRISE IN JOHORE AND THE MALAY PENINSULA GENERALLY.

(*From our Special Correspondent*)

There are several groups of coffee estates in Johore, but those visited on this occasion lie at the southernmost point of 'the Malayan Peninsula. Having been told by the proprietors that there was nothing in the way of soil, it was an agreeable surprise to find that, compared with the majority of the estates visited in Perak and Selangor, there was some very fair soil in parts of the property in Johore. The coffee is Liberian and planted on undulating ground, close to the seashore, a narrow belt of coconut palms and native gardens separating it from the open sea. The highest points are probably a couple of hundred feet above sea-level, and the higher you go, the worse the soil and the greater proportion of cabook gravel. This is exactly the opposite to what may be found in the hills of Perak, where the higher you go the better the soil as a rule, of course there are pockets of fine *surface* soil in the hollows. Amongst these little hillocks and sloping fields in Johore there are great stretches of swamp with black soil, and in these positions sago palms flourish, and great numbers (some hundreds of acres) have been planted up. The Liberian coffee is very much exposed to the winds from the sea, and is without shelter from the tropical storms that come tearing across the Straits. Very bad weather prevailed at the time of our visit. In spite, however, of this drawback and the want of richness in most of the soil, the coffee bushes looked very well—fine fields of dark-green trees, bearing a good crop. They had been a long time growing before they gave any appreciable profit, but there were many other reasons for this, apart from the conditions of soil and climate. The coffee is peeled on the estate by means of hammer pounders, working in mortars, and the superintendent could well be congratulated on having obtained the highest price for Liberian in the London Market. This estate can boast of an engine and steam-worked machinery.

These properties are unfortunately completely isolated from civilization and society, being some sixteen to twenty miles by sea from Singapore. Considerable extensions have been made and are still in progress, and before long the company to all appearance will possess a very valuable property. A number of Javanese coolies are employed, as well as Tamils, Malays and Chinese. Large numbers of nutmeg trees are planted at intervals through the coffee, and the produce is now coming in. Another source of revenue is cubebs, the vines of which appear to be flourishing and doing well. Ipecachuana is also grown on the estate and is said to prove a profitable cultivation. As regards the common enemy leaf disease with the green bug—these estates are no better off than those in the protected states, in fact are to all appearance rather worse. It may be mentioned that the green bug can be seen in Penang on a guava tree right in the middle of the town.

Speaking generally of the impression received during a trip through Perak and Selangor and a short visit to a small portion of Johore, it would appear that the Liberian variety of coffee is admirably adopted to the soil and climate of the country throughout the Malayan Peninsula, and that the Arabian coffee does very well on the higher slopes of the hills in Perak. With present prices the estates are paying well, and future prospects are very brilliant. The great question at the present day is that of labour. Present prices may admit of a daily wage of twenty-five cents of a dollar, but that amount is a very heavy one on which to estimate the working of the estates as a general rule for the future. Railway and road communications will shortly be such as never at any time advantaged the opening of any new district in Ceylon. The terms on which jungle land is offered to *bona fide* investors are extremely favorable more to what has obtained in Ceylon during the present generation of planters in the island.

There are many other products for which suitable land can be found in these settlements, such as sugar, pepper, tapioca, sago, tobacco, gambier, rice, coconuts, &c.

Of these the favorite amongst Europeans seems to be pepper. The method of supporting the vines adopted by Europeans usually differs from that of the native planters, who train the vine up the stem of a living tree. As a rule the dadap (*Erythrina indica*) is used for this purpose, it being a fast-growing tree and easily propagated either by seed or cuttings.

The European custom however is to train the pepper vines upon pieces of roughly split hardwood timber, which is said to withstand the weather and the attacks of white ants as long as will be required for use as supports to the vine, that is to say as long as the vine can be made to give profitable crops. In one Chinaman's garden we saw some very old pepper vines said to be twenty years old clinging to these supports; though in many cases it seemed as if the vine supported the remains of the decayed posts rather than the posts supporting the vines. It is moreover advanced by the advocates of the post support system, that the vines are more prolific when exposed to the sun than when grown under the shade of living trees, and it may well be that there is a good deal of truth in this statement. Pepper vines have their natural enemies like every other product. A little beetle lays its eggs in the knot from whence the new shoots spring. The egg develops into a maggot, which bores its way into the young shoot, and a foot or more in length of course dies away. Gangs of coolies are employed cutting off the affected shoots and putting them into buckets of boiling water. Some of the pepper fields are bearing heavily and should give a handsome return. They are mostly treated with manure of various kinds. The bats' dung guano found in the Batu limestone caves is said on analysis to be wanting in phosphates, but however this may be it seems to be very suitable for manuring pepper vines; some that had been treated with this guano were bearing a very heavy crop. An experiment was being tried on one estate. Dipping the clusters of pepper berries into boiling water before drying them is a common practice, but this experiment consisted in exposing them for some minutes to the smoke from a wood fire. It has not transpired what has been the result, but one would suppose great care about the selection of the wood should be exercised, especially if it were in a green state. Many woods produce a disagreeable pungent smoke—sometimes of a very disagreeable odour, and the pepper might become unpleasantly tainted either as regards taste, or smell, or both. In Selangor large extents of land covering thousands of acres in the aggregate have been opened up by Chinese principally for the cultivation of pepper, tapioca and gambier. Their success has been great and a large trade has sprung up, so much so that an enterprising firm of Chinese at Singapore are running small steamers to bring out the produce and carry it to the markets at Singapore to be thence transhipped probably to other parts of the world.

There can be little doubt that in the course of time the whole of the Malayan Peninsula will become a British province including all the protected states and probably Pedah and other districts nominally under the King of Siam. At present life and property in the protected states are just as safe as they are in Ceylon or Burma: in fact more so. Consequently investors of capital need not fear anything beyond what is naturally inherent in any unopened country.

SÃO PAULO RE-VISITED.

TRAVELLING TOWARDS THE INTERIOR—VIEW OF THE CITY AND OUTSIDE—TRAMWAYS—TELEGRAPH AND TELEPHONE WIRES—GAS VERSUS ELECTRICITY—BUSY STREETS—NEWSPAPER BOYS—BAKERS—BUTCHERS—BREWERIES AND ICE MANUFACTORIES—HOW MILK IS SUPPLIED—COOKS—SUPPLY OF PROVISIONS—LECTURING A PIG—FUEL FOR DOMESTIC USE—EARLY RISING HABITS OF THE PEOPLE—THEIR COSTUMES—HOUSES FOR WORKMEN—THE RAILWAY STATION AND TRAVELLING ACCOMMODATION—WANT OF IMPROVEMENT—TRAIN SERVICE—PHYSICAL FEATURES OF THE COUNTRY—DESCRIPTION OF THE JOURNEY—DIFFERENT GAUGE RAILWAY LINES—CULTIVATION—FESTIVITIES AND OTHER AMUSEMENTS OF THE PEOPLE OF CAMPINAS.

Travellers by the early train from São Paulo to the interior have to be on foot at 5 a m. Some little time is spent on fortifying oneself with coffee and bread and butter—the latter quite a luxury, fresh and firm, procured from the European colonists who live on estates near by or who have small farms of their own in the vicinity. Although we had seen few guests at the hotel the night before, we found them numerous now wishing to pay accounts. It is well that carriage fare to the São Paulo railway station be included in the hotel bill; for then one of the many carriages in waiting is secured by a waiter, and the luggage being put in, we have only to step in at the porch of the hotel, and there is no haggling with the coachman on arrival at the station. Four shillings looks a big sum for a four-wheeler, when a single passenger could go by tram-car for five pence, but there are two of us, and as each has a portmanteau, a saddle, and small things, the cab is preferable.

I mentioned that the station at which we arrived last night was near the outside of the town on low ground at the east end, the second nearest Santos and close to the São Paulo railway line owned by an English company. The comfort of the public could have been easily considered by making both stations at one place, with little cost to either company, but railway directors here make public convenience a secondary consideration; so the traveller from Rio has to find his way from the east end uphill to the centre of the city, and then descend to the west end where the other station is. The English company's station was made some years before the Sã Paulo and Rio de Janeiro railway was projected.

By the time we leave the hotel daylight has broken, and we can see from the open carriage what a delightful site has been chosen for the city. It is on rising ground facing the east. About 200 feet lower, and at some two miles distance, is the River Tiete, which is here little more than the outcome of a mountain stream which comes from the hills between São Paulo and Santos, and as the ground in the valley is flat the river winds slowly amongst small, artificially-made woods and natural pastures towards the west. The streets of the town are laid out regularly, at the outside part of the town, but in the centre they partake of the irregular Portuguese style, and some are not very broad. All are clean, and well paved with square granite blocks, the shape of bricks, with kerbstones and side paths of large granite blocks or of concrete.

Churches form the most imposing buildings, and they also monopolize the most conspicuous spots. Government buildings are also conspicuous by their massive forms, and large sums seem to be spent in elaborate houses of business, and retail-shops. The upper-floors of these are used as dwelling-houses, and one can observe that all are, inside and out—an imitation of the European style. Outside the business part of the town, and as we drive down towards the railway station, there are some very neat palacettes with surroundings of trees and shrubs of a kind not often seen in the same latitude as São Paulo. Very little indeed is seen to give one an idea of being in the tropics. It is rare to see a house with a verandah, yet at some seasons of the year the sun must beat strongly against these granite walls, and turn the inside rooms into an oven. Verandahs do not seem to have attracted the first settlers in this country, for certainly the warmer parts at the foot of the hills or the sea coast do not show many houses with these valuable additions to a house. Even in the warm seaport towns in the north they are conspicuous by their absence.

The city has a nicely arranged tramway service which seems to conveniently suit the dwellers of almost every street. The cars are all open, seats across with reversible backs, and for four have plenty of room on each seat; at the end of each seat is a support for the roof. The gauge looks to me to be one metre, certainly not exceeding 3'-6", and the motive power is supplied by two mules abreast, and an extra one is put abreast at the foot of the hills. These tram-cars run far out of the busy part of the town to the regions of quiet "chacaras" (as they call a house situated in the midst of a piece of pasture, shrubbery or garden ground), where the business man can spend his spare hours in domestic bliss, and the lady of the house can amuse herself with her poultry, her flower and kitchen garden.

One can observe by the number of wires suspended above the houses that there is an extensive telephone service, and in the centre of the town are several telegraph stations. I have already mentioned that the gas for lighting and for gas engines is supplied by an English company, and this is threatened annihilation when the contract time has run out by the substitution of electricity. I think the sensible people in S. Paulo will, before changing the system of illumination, examine well whether the electric light has been a success in the towns in the same province where it has been and is being introduced.

The numbers of people one sees in the streets at this early hour are not confined to those seeking the railway station. The streets are ringing with the cries of newspaper boys, and numbers of shoe-blacks are accosting pedestrians, and pointing to their feet. The bakers' van is seen rattling along with supplies of bread to their customers; the small provision shopkeepers in the various streets, bearers of large square willow-baskets, with the contents carefully wrapped in red blankets, are distributing hot muffins to houses as they go along, while others are stationed at the corners of the streets selling the same kind of wares "to such as choose to buy 'em." By a wise arrangement beef is distributed to the butchers the night before, after having been inspected by competent authorities. There is more than one brewery in S. Paulo judging by the number of springcarts one sees conveying bottled beer. Nor is the aerated water

manufacturer less alive to the advisibility of delivering his full syphons, and soda water and lemonade bottles, and taking away the " empties," early in the morning. Cool as the weather is, large blocks of ice, the shape and size of paving flags, are to be seen conveyed in spring vans, exposed to the air. In some towns in the interior one notices at this early hour milk boys with bottles in square baskets of perhaps two dozen, on each side of the mule on which he may be mounted, or he may see single bullock hackeries laden with vegetables as well as milk, and these all sent from farms in the vicinity of the town, but here the milk distribution is different. There are to be seen large black and white cows with short horns and with udders reaching to near the ground; a man goes before with the halter in his hand, and a calf with a piece of leather fixed over its mouth is tied to the cow's tail and follows behind. These go in solemn Indian file through the streets; the buyer of milk hears the tinkling of the bell which is tied to the cow's neck; and presents the man with a tumbler or a tin vessel; the milk is drawn directly from the cow up to the quantity required, and then the procession resumes its course until another customer appears. There are also houses at which he calls daily. Now, my good housewives, is not this a capital plan? No chance of baby's milk being mixed with chalk and water here, and if " child's milk " should be always drawn from one cow, here you have it in its unadulterated purity and your temper does not get ruffled in the early morning.

[In this matter of milk certainly Brazil is far in advance of India and Ceylon.—ED. *T. A.*]

Cooks, both male and female, of all colours, from the white-skinned, olive-eyed native of Southern Europe to the rolling-in-fat ebony-black, descended indirect line from the land owners of Angola or Mozambique, are to be seen returning from the market with the daily supplies, for both large and small culinary establishments, conspicuous amongst which are beef and vegetables of local production. Nor are New Zealand products wanting, for the frozen-meat steamers, which call to coal at Rio de Janeiro twice a month, leave each time a large quantity of potatoes, butter, cheese, game, salt-beef, salt-pork, hams, bacon and other things which are all sold cheaper than the same kinds; the produce of this country; carcases of fresh mutton are also left. The cook's reticule willow-basket is a recipient for a varied assortment of eatables, and live produce is often seen hanging outside in the shape of chickens, ducklings, etc. Live pigs are bought and carried to be killed at home. One beautiful twenty to twenty-five pounder, a good specimen of pure Berkshire, was dangling by the hind feet at the end of a stick, which was slung over the shoulder of a stout negro who was every now and then stopping and turning round to give his very unruly charge a lecture as to the advisability of giving expression to its sentiments in a less noisy manner, and threatening to reduce the term of his life by a couple of hours by letting him fall at once on the hard stones, which lecture the pig did not mind much; and the negro did not carry out his threat.

Railway freights seem to make coals scarce for culinary purposes, for boys are seen carrying bundles of firewood split in sticks of a metre long, and two to three inches thick; a bundle of ten will cost about a shilling. Charcoal enters largely into consumption in the laundry, and is also a costly item in the S. Paulo household.

Brazilians are noted for their early rising, and we are not surprised to see many well-dressed people enjoying an airing, ladies and gentlemen walking, rosy-faced children being driven about in perambulators under charge of clean tidy looking Italian and German maidens, youths on bicycles are flying about, and there are also to be seen the lords of the soil on thorough-bred English horses with English grooms with cockades in their hats, and the regulation groom-clothing.

As before mentioned, everything suggests a temperate climate, and a people bent on copying European customs. Top-coats, Scotch plaids, and muffler shawls are general amongst the male portion, and beneath these are suits of West of England black, or Scotch tweed, the head cover being either a Parisian chimney-pot or a Christy or Townend stiff felt hat.

The dresses and outside coverings of the fair sex are similar to what one would see in the large towns in Europe in spring. The newest Parisian styles are always adopted, and the *artistes* in ladies' dresses are either of French nationality, or have had a training in Parisian establishments. An American gentleman who lived at the same hotel with me told me he had been over the *whole world*, and he "never saw *women* dress so *mighty* fine, and whose looks were so *mightily* improved by their dress as in Brazil." There is some truth in these remarks, but as regards these São Paulo *brunettes*, the erect carriage, the correctly formed figure, the healthy glow shining through the slightly tinged features, the long raven locks hanging down behind often a long way below the waist, offer very little exercise for the improver's art. I know a great difference since I was here some eight years ago. Then there were large empty spaces near the railway station which are now filled up with large buildings, the lower portions of which are used as warehouses for country produce, particularly coffee, and the upper floors as counting-houses for commission merchants, or dwelling houses for commercial men. Santos, the seaport, which is distant some 56 miles by rail, has turned so very unhealthy of late years, that much of the business which was done there is done now in São Paulo.

There are many neatly built houses for European artisans near the railway station. These are kept very tastefully. The occupiers are employed principally in the workshops of the São Paulo Railway Company and many are in service of large mechanical, and industrial establishments which have sprung up near the railway station of late years. There are iron foundries, brass foundries, machine-shops, sawing and woodworking shops, employing principally English speaking people, while amongst those employing a mixed population, and in industries heavily protected by an import duty, are cotton mills, breweries, distillers of spirits, and makers of natural and artificial wines, French tile works, granite and marble works, lucifer match-makers, hat making establishments, boots and shoe-making factories, potteries, glazed pipe makers and many other occupations which have had an existence of only a few years as yet. There was always an ice manufactory, and lately to the list of labour-saving establishments is added a laundry filled with the most modern steam appliances.

The railway station itself shows little improvement on former years. It has not half the accommodation which the large increase of traffic demands. The trade of the province has increased at least ten times ever since this station was made, and the railway being the great trunk li c, which is fed by all the various branches whose ramifications extend through the length and breadth of the province for many hundreds of miles, has to receive all the passengers and goods, either to and from the seaport, Santos or to and from the capital of

the empire, Rio de Janeiro. The luggage department is too small, and is constantly filled by unruly crowds of people; porters, barrowmen, and mule cartmen, are continually fighting round a single weighing machine, placed on a narrow verandah about 20 feet by 10, open to the street and divided from the platform by an iron railing. A single clerk has to do duty of writing out the receipts and receiving the money at a window opening from the end of the verandah beside the weighing machine. Passengers have to pay for all that goes into the luggage van, a rate per kilogramme.

The passenger has to depute someone else to see after his luggage, and all he knows of it is from the receipt which may be handed to him in at the carriage window, just as the train is starting from which he supposes it is safe. The platform is broad but not enough of it, and there is a crush at the arrival and departure of every train; and if colonists, newly arrived from Europe, are going with the same train, there is scarcely moving about at all on it. The refreshment-room is a dark dismal looking place, and the lavatories are repulsive. A new station ought long ago to have been built, and the engineer of the line told me he had planned and estimated for one years ago, but the sanction of Government had always been withheld. Although the fiscal engineers allowed liberally for general upkeep of the line, they were always averse to improvements which were to cost a large sum of money. On all guaranteed railways the Government have a fiscal engineer who watches over all expenditure, so as to keep down to a low limit the Government quota for interest on capital guaranteed. The contract with the São Paulo Railway Company allowed 8 per cent to go to the shareholders, but all above this, in the net profits, had to go to the Government, to repay it for, interest paid during construction, or on account of other expenses connected with the guarantee. The Government have now been paid up all that had been so spent, and I daresay São Paulo will soon have a railway station built on British lines with grand accommodation for all.

As few carriages are run, in proportion to the number of passengers, there is some difficulty in securing room for ourselves, and for the small parcels which we are allowed to take into the carriage, but at the junctions with other lines we find more room as we go along. The old cross-seated English carriages formerly on this line have been turned into saloon carriages with one door in the middle opening directly on to the platform, but the barbarous practice of locking the passengers in still prevails on this line and on others in the province of São Paulo. This was adopted at the commencement of railway travelling in this country, because of the dread that the ignorant native would be often opening the door, and accidents might happen. Now that the native is educated, the railway officials stick to it because it saves them bother in having to wait for passengers who may get out at small stations on the line from mere curiosity. This being the starting point of the train it starts punctually to time at 6-20 a.m. I had met no old friends in São Paulo, as I arrived too late at night and had to leave early next morning. A white mist lies low on the valley of the Tiete, but the hills beyond towards the north are clear; from these at a distance of some twelve miles comes the water which supplies the city. The water company although having its head office in Sao Paulo has many British shareholders, and the engineering of the work was executed by British engineers, and piping and other materials not found in the country, were imported from England. The river Tiete is crossed by an iron lattice bridge about six miles from São Paulo. Here the elevation is about 2,380 feet above the sea.

The physical features of the country are not very remarkable. From Rio de Janeiro as noted formerly after crossing the Serra de Mar we arrived at Barra de Pirahy. The latter place is 67 miles from Rio and the height above the sea is 1,180 feet.

From Barra de Pirahy we go alongside the river Parahyba for 196 miles to Guararema, which is 1,824 feet above the sea. We pass over some hilly ground on our way to São Paulo, which is 46 miles further on, and has an elevation of 2,508 feet. We have had the ranges of the Serra de Mar to our left and *east* of us, and the Serra de Mantiqueira the highest peak of which is Statiana on our right and *west* of us. The hilly ground alluded to forms a sort of connection between these two great ranges of hills, and the hills we notice to the north of the city of São Paulo are some of the spurs of the Mantiqueira, and these join on to another range which runs east and west called the Serra Negra, and forms for some distance the division between the Provinces of São Paulo and Minas Geráes. These do not rise to a great elevation but they form the water-parting between the river Tieté, which flows through the centre of the Province of São Paulo and the Sapucahy which runs through the southern part of Minas Geráes, and both run into the Paraná. It is in the smaller ranges of hills scattered over the Province of São Paulo where coffee, the principal agricultural product grown for export, is cultivated. These hills and mountains both large and small which we have at present under notice are all more or less of the same formation, granite or gneiss forming the foundations; and laterite sometimes sandy often chalky but generally shaly and largely impregnated with oxide of iron, underlies the cultivatable soil. As we go further west in the Province of São Paulo the formation partakes largely of this latter description, and it is of this slatey clay that the famous *terra rocha*, a red waxy soil, is formed and which is the most valuable for coffee growing. Indeed we do not find much coffee grown in the Province of São Paulo until we go west, where this soil is to be found. We notice the improvement in agriculture as we go west owing to this superior quality of soil.

At Belem, 24 miles from Saõ Paulo and 2,544 feet above the sea, we go through a tunnel perhaps 200 yards long. The hill it passes through is not over 150 feet above the level of the railway. At 30 miles from São Paulo, Campo Limpo is the junction of a line to Bragemea, a metre gauge called the Bragantina Railway. It goes direct north towards the Serra Negra, a distance of 32 miles. at 37 miles from Saõ Paulo we come to Sundiah, 2,330 feet above the sea, and here the English Company's railway ends. At Sundiah is a beautifully commodious station and finished quite in the English style; here is the junction with the Stuana Railway. The Stuana goes south to the town Itũ, famous for its schools and convents, and has an extension to the river Piracicaba on which are small steamers. To Itũ the distance is 44 miles and the extension is 57 miles more: the gauge is a metre. It was first opened in 1874 to Itu and has been going on gradually extending. The guarantee is 7 per cent on £200,000. The branch towards Piracicaba taps a large coffee producing district. There are also three sugar factories on the side of the line, enjoying a Government guarantee, but the planters do not supply them with enough cane.

The São Paulo Railway which ends here starts from Santos, and has a length of 93 miles; the gauge is 5ft. 3in. It cost £2,500,000, and the Government

guarantee was 7 per cent which is all repaid and the line gives now an excess of receipts over expenditure, £400,000 a year.

Railway communication is extended from here by a Brazilian Company called the Paulista Railway Company on the same gauge, 5ft. 3in, and has no guarantee. The English Company had the preference for extending some 80 miles farther into the interior—to Rio Claro —but in these days, in 1870, the coffee crop was not more than a quarter of the present yearly yield, and they did not feel their capital would be secure, and contented themselves in being the trunk line through which all the produce has to pass on its way to the sea-coast from the interior. The Paulista Company opened the first section from Sundiahy to Campinas, a distance of 28 miles in 1873, and to Rio Claro 55 miles farther in 1876 and to the river Magy-quassu some 40 miles more in 1878. Magyquassu was made navigable by clearing out the rocky obstructions with dynamite for some 120 miles farther, at the expense of the Company, and they put appropriate steamers and barges on some three years afterwards. The Company has never paid less than 9 per cent per annum.

The train stays only the length of time at Jundiahy to change engines and take out the luggage of passengers going by the Ituana line. Carriages are not changed: the English and the Paulista Company are the same gauge, and accommodate each other as regards passenger and goods wagons. Between Jundiahy and Campinas we see the first of the large coffee plantations, and we enter into the region of *terra rocha.* What a falling-off is there! In the Seventies these coffee fields by the side of the railway used to be loaded with coffee every year, and judging then from the healthiness of the trees and the strength of the soil one would have thought the planter was secure of a large income for a long lifetime; but weeds and wash tell on the best soils, and on even the best formed fields, and many of these are giving only as much crop as pays expenses. All available forest-land had been planted up years ago, and no young coffee could be seen.

Campinas was reached in due time and here we had to change carriages from the wide gauge of the Company Paulista to the narrow of the Moggana. There was time for us to take breakfast, but there was a crush in procuring seats. The tickets were checked at once, and the doors were locked and the train did not start for more than half an hour. This was annoying as we calculated on breakfasting at Campinas; but fortunately some of the sandwich loaf we bought from Rio the day before, was still to the fore, which stood us in good stead. Campinas still shows signs of having been the coffee capital of São Paulo, for there are no fewer than four large foundries, with machine shops attached. These are all new to me, for when I was here before, machines were made in Europe or the United States, and merely fitted up here. Now only steam engines, boilers, and iron water-wheels are imported, and what is properly called coffee machinery is made here. The workshops are all beside the railway station. In these four large establishments and in the repairing and erecting shops of the railways there are said to be some five hundred mechanics, comprising fitters, boilermakers, coppersmiths, millwrights, moulders, carriage builders, and painters, and these are nearly all British subjects. Here in Campinas I had many friends in "the days of old," but for reasons stated before I could not wait for a day to see them. The station is on rising ground—above the town to the *south* of it. The town itself is in a lowlying hollow; a sort of birds-eye view of it is got from the railway. Here as in all other places, the increase in size and the improvements in buildings are all on the side of the railway station. When I knew it before the station was surrounded by green fields; the hotels were all down in the hollow where all the houses of the planters were, and all the places of business. All this is altered; quite a new city has sprung up. Spacious hotels and lofty mansions and neat cottages cover a large piece of what was waste common.

Although coffee has well nigh abandoned the Campinas district, and the extension of railways has sent cultivators of the berry into the interior, where soil is much uperior, and available land plentiful, still a great many of the old wealthy planters retain their establishments in Campinas and live with their families, alternately on the fazenda and in the town. They used to have their seasons of balls and parties, their race meetings, and above all their great church feasts, at which as much money would be spent in fireworks and tomfoolery, as would clothe and educate all the poor in the district; and there was the Carnival when for some three days all the youth of the town would turn out in masquerade and processions formed of emblematical pageants parade the town in fantastical dresses, caricaturing. Local and political events play all sorts of antics, and cut all sorts of practical jokes. Chief amongst the latter would be to blow with a tinhorn into the ear of some inattentive person or squirt scented water on the face or neck of some unsuspecting fair passenger. Nor are these fair ladies without their "bisnagas" (as they call them, made of lead which they squeeze to eject the water) and lemons filled with water which they apply in return. Then they will have their fancy balls in the evening where all classes mix in disguise, and dancing, mirth and fun go on till early hours of the morning. Easter week sends all to town to enjoy Newfoundland cod-fish for three days (as the only food allowed) and finish up with balls from which the faithful—which include nearly all those attending those luxurious functions—sally out to meet the midnight processions at which the images carried, the prayers read, and the sermons preached on the street are intended to impress the people with the death, burial, and resurrection of our Saviour.

Christmas week also sends many to town. I have always thought there was less warmth of demonstration amongst the people of this country than in those of Europe at their Christmas festivities.* Europeans, especially Germans, do their best to imitate the doings at these Christmas celebrations, and by them the priest is not put forward as the most important personage. Many other occasions send the planter to his town house.

It is considered fashionable to have a taste for music, particularly of the lyrical order, represented by Italian opera; and to secure good companies the rich people subscribe large sums which entitles them to boxes or stalls for their families during all the recitations. Often European operatic companies visit Rio de Janeiro, and some of these are induced —particularly since railway communication became so general—to visit the towns in the interior, when success is secured by a large subscription list. Nor must I forget to mention that Campinas is the birthplace of a contemporary composer—Carlos Gomes—author of some very good operas, which have been performed in Europe. Among these are "Salvador Rosa," "Fosca," "the Guaruny," and "Lo Schiava" The slave. Carlos Gomes had early developed

* This may be accounted by their having so many festivals during the year, and the great yearly feast which takes place at different times for each town or district, which outvies all other feasts.

musical talent, and the Emperor knowing of this sent him to Italy to be educated. He has visited Brazil several times, and last time a few months ago a committee arranged with a talented Company then in Rio to play his operas in Rio, S. Paulo and Campinas, which they did to crowded houses.

Campinas has its service of tramways, its gaswork, and at present a water supply is being provided for. But we must now leave Campinas and continue our journey farther on, the account of which we must leave for a day or two. A. SCOTT BLACKLAW.

PLANTING IN THE MALAYAN PENINSULA: PERAK.

(*From our Special Correspondent.*)

PERAK AND SELANGOR—WANT OF BRITISH ENTERPRISE AND CAPITAL—PERAK SUITED TO TEA AND COFFEE—ROAD COMMUNICATION AND OTHER CAPABILITIES FOR PLANTING—GOVERNMENT OFFERING LAND AND CAPITAL ON EASY TERMS TO ENCOURAGE CULTIVATION—THE CLIMATE AND SOIL—GENERAL FEATURES OF THE HILLS AND THE LAY OF LAND—FORESTS—COFFEE ON WATERLOO ESTATE AND ON ADJOINING PLANTATIONS—INSECT PESTS NOT SO VIRULENT AS IN CEYLON—LIBERIAN COFFEE—CACAO CULTIVATION—SQUIRRELS—INDIARUBBER—CINCHONA—THE HERMITAGE BUNGALOW—PERAK TEA—PLANTING PROPSECTS.

The good people in the Protected States of Perak and Selangor apparently don't make noise enough—they don't shout out sufficiently loud to attract British enterprise and capital. Possibly the greater number of the residents in these States do not particularly care to have a lot of outsiders running over the country, criticizing the position and comparing one State with another; but if we are to suppose that the authorities are wishful—as they say they are—to facilitate the development of the resources of the country and to attract European settlers, it may respectfully be suggested they should take the trouble to say so, and say so in such a way that planters in the colonies and capitalists in Europe cannot fail to hear them. Let them take Ceylon for example and follow suit in the policy which has made her capabilities known to the uttermost parts of the earth.* How often have we heard discussions about suitable localities for agricultural investment, and when these Protected States were mentioned the reply has been: "Oh! those native States, you never know where you are; neither life nor property is safe when a ruffian of a native has the chance of getting anything by interference in your affairs." To this assertion there is probably no reply, simply because people don't know what in reality is the fact, that the Sultans of these states have no more to do with their administration than have the editors of the *Ceylon Observer*. The young Sultan of Perak is a mere nonentity, and the decrepit old man who nominally holds a similar position at Selangor hardly ever visits the seat of Government (Kwala Lumpur), and has only done so three or four times since the British Government quietly intimated that he must be content to stand down. Were this state of affairs more widely known, and could capitalists at home realize the fact that life and property are as safe in the States as they are in Ceylon, there would without doubt be a better chance of speedy development of the resources of the country than will otherwise be the case for many years to come. And then again as regards communication with the outer world, how very few there are—unconnected with the trade of these localities—who are aware that steamers run daily between Penang and Port Weld in Perak and three or four boats a week between Selangor, Penang and Singapore.

Naturally in Ceylon more is known about these matters than is the case elsewhere, because there are so many Ceylon men in the Straits in all kinds of positions, from the Governor of the Straits Settlements to the cook at the Government Tea-garden Resthouse in Thaiping.

In Perak there are hundreds of thousands of acres of fine forest inviting the axe of the planter—forest which the local Government is anxious to see taken up by suitable men with money enough to turn it into plantations of tea and coffee. They have led the way by going to great expense in planting experimental gardens and growing tea, coffee, cacao, cinchona, pepper and indiarubber, as well as many kinds of fruit trees. The sites of these gardens, perhaps, have not been in every instance selected with great care, and are certainly in some cases very unsuitable for the purpose for which they were chosen; but even in this they were not without their use in showing what should be avoided as well as what should be availed of. Perak is already traversed in all directions with capital roads, and these are being extended as opportunity demands. A new road is now in course of construction through an immense block of forest adjoining Thaiping, where the well-known property—Waterloo—stands as a sample of what can be done with coffee in that quarter. This road will be about thirty miles in length, made, be it noted, through the forests in advance of its probable sale at some future day.

It is understood that the Government will alienate blocks of forest, up to 500 acres each, to the first five applicants, at the rate of one dollar an acre. It has even gone so far as to advance money towards the working of gardens and would probably do so again if a good case for assistance was made out in the case of those who took up the above-mentioned blocks; but of course men are wanted who have sufficient capital to bring into profitable cultivation the lands they have acquired on such very easy terms. The climate seems admirably adapted for the cultivation of such products as tea, coffee and cacao, there being no long periods of drought nor yet any long spells of cold and wet, such as characterize the hill-country of Ceylon during the South-West monsoon. The climate naturally differs slightly in distant parts of so extensive a country as Perak, but certainly not in the degree we are accustomed to in Ceylon, Mauritius, and India.

The soil over the great extent of the hill-country of Perak closely resembles that of parts of Dimbula, Upper Ramboda and Madulsima,—a yellowish clayey soil which grows more red and more friable the higher you get up on the ranges. This soil is of immense depth, but there is apparently an absence of any large extent of rich brown mould, which we should call really fine soil in Ceylon.

The general features of the hills are not sufficiently broken by precipices and rocky débris to admit of pockets and fields of rich soil which we find in most mountainous tracts of country. The lay of the land is often steep, but the surfaces not very rough. The rock that crops up is a fine white granite, with

* How? Not by Government, but by the Planters and Press—and very notably through the *Tropical Agriculturist*, which has sent the name of Ceylon and her planters and products all round the world. But Mr. Swettenham, in his recent report, contends that Government has done all that was possible to attract planters who refuse to come. The labour difficulty is the lion in the path.—ED. *T. A.*

large crystals of felspar,—the latter, perhaps, it is which adapts the soil to coffee cultivation. Large blocks of limestone rock appear here and there throughout the country, and dark close-grained trap crops up as well in the same locality, precisely as it does in the Andamans. Before leaving the magnificent forests of Perak it must be noted that to the botanist—and perhaps even more to the casual observer—they possess especial interest, not only because they differ so much from the forests of Ceylon and Penang but because they exhibit vegetation in so many unique and startling forms; the creepers especially are most beautiful in form and colour, but where all are lovely it is impossible to award the prize to any particular variety.

Waterloo estate coffee is entirely of the *Arabica* species. A few trees only of Liberian coffee near the bungalow give sufficient proof of how this variety of coffee suits this part of the country. Those who in years past have followed the hi tory of the Waterloo property are aware that it was almost abandoned when old friends Logie and Tom Fraser undertook to resuscitate its fortunes, and so well have they succeeded that the old coffee is again bearing well and the weeds and jungle stuff, which at one time almost choked the coffee, have disappeared, and the coffee bushes—now in the form commonly known as umbrella trees—are bearing well and at the same time are in vigorous condition. The two and a half years old field at the top of the estate, some two thousand and odd feet in elevation, is a very fine field indeed—as good as the best I have seen anywhere during my thirty years' experience of "the fragrant bean."

The young plants in an adjoining clearing have made a grand growth during the time they have been planted out; and with a sufficiency of labour to carry on operations the outlook of Waterloo is extremely satisfactory. As a fair samp'e of what may be expected by planters taking up land for coffee in the adjoining forests Waterloo amply proves that there is every prospect of success and a bright future before investors. The pests that have proved so disastrous in Ceylon are not unknown in Perak, but the testimony of those who are most interested and who have watched them for years past tends to prove that their attacks are not attended by the virulence and devastating effects with which we are unhappily so well acquainted. Of this a casual visitor is necessarily but a poor judge; and were it not that it is but right to mention their existence as a matter of fact connected with coffee cultivation in Perak, they would hardly have been alluded to at all.

Liberian coffee on a few bushes at about 1,900 feet flourishes exceedingly, as also down at almost sea level. At Kamouning, probably 500 feet above the sea, there is an estate of some 140 acres in different stages up to eighteen months or two years, and the coffee is looking vigorous and promises to do well. There is some fine soil on this property, and plenty of limestone available in one part of the estate. As far as could be ascertained there is no estate of any size in Perak at present where Liberian coffee has been proved to be a success, but the proprietors of Kamouning have estates in bearing in one of the adjoining states and are very confident of similar results from its cultivation in Perak.

Around Lady Weld's bungalow—some 15 or 16 miles from Thaiping—a variety of trees have been planted as an experiment, and amongst them are some very fine specimens of Liber.an coffee, say fifteen feet in height, bearing well, with flower and fruit in all stages, as becomes the nature of the plant. The situation of the garden is not well adapted for cacao, being flat and at times of high flood actually under water, but some of the trees have evidently grown well, but are now much diseased and decaying away.

The squirrels from the adjacent jungle which surrounds the garden evidently make short work of the cacao pods.

Ceará indiarubber has grown to a height of 20 to 25 feet—perhaps more—and the seedlings have begun to show themselves amongst the dense jungle round about. This gives a hint of what might yet be done in Ceylon: a few bushels of seed collected year by year by those who still have Ceará trees on their properties, thrown broadcast in the belts or useless jungle adjoining their estates, might in a few years prove a profitable investment, in the same way as the cinchona seedlings promise to do in the forest around the Kandapola estates, or at any rate did some half-dozen years ago.

The Hermitage is a bungalow built on an isolated spur of the Buboo mountain, some 3,600 feet above sea-level, and is reached by a riding road nine miles in length, cut through the jungle from Lady Weld's bungalow which is 15 or 16 miles from Thaiping. On the steep sides of the knoll on which the Hermitage stands, tea, coffee and cinchona have been planted and have apparently done a great deal better than might have been expected, considering the steepness of the land and its exposed situation. The bungalow was originally intended as a sanatorium for the Resident, but another one has been erected on the summit of one of the hills overlooking Thaiping, and the Hermitage is occupied by an old Ceylon man, Mr. J. F. M. Cock, in the position of Superintendent of Government Gardens. Nothing much is now done immediately around the Hermitage, but half-way down the hill is an estate called "Cicely," where tea is made and coffee is grown in a small way. Just now the Perak Government is advertising 1,000 lb. of tea for sale; but it is understood that the garden has been rented out to a Chinaman. Some of the tea made at Cicely is very nice indeed, and fully justifies the encomiums showered upon it by some of the home journals; but, again, some of it—as served at resthouses and other places—is very poor weak stuff.

There can be no doubt that the moist warm climate of the Peninsula is especially adapted to tea, but in the meantime there is no possibility of its taking any place in the London market simply because there is none to send at present.

Perak has, no doubt, a great future before it when the labour supply is put on a better footing and capital is attracted by the advantages that are offered by the administration.

TROPICAL CULTIVATION IS SELANGOR, STRAITS SETTLEMENTS.

KWALA LUMPUR—LIBERIAN COFFEE CULTIVATION—SOIL AND CLIMATE—HANDSOME RETURNS—GEOLOGICAL FORMATIONS—A GREATLY-FELT WANT—COFFEE PULPERS—LEAF-DISEASE AND GREEN BUG—ARABIAN COFFEE—FORESTS AND LABOUR SUPPLY.

Selangor adjoins Perak on the East and South, lying nearer Malacca and Singapore. As yet tin mining has constituted the principal industry of Selangor, but large tracts of land have been taken up for cultivation of various tropical products—coffee, pepper, sugar, tobacco, tapioca, &c, &c.

To begin with, however, reference will be confined to coffee and what was learnt about it from personal observation. Kwala Lumpur is the capital town of Se'angor, reached by nineteen or twenty miles of

railway from Bukit Kuda. In the neighbourhood of Kwala Lumpur there are two Liberian estates in bearing and a number of promising young properties lately opened. The largest of the two estates in bearing is Weld's Hill, some two hundred acres more or less in bearing and some young clearing. The lay of the land is (generally speaking) of an easy gradient on both sides of a valley. The oldest coffee, a few acres, is about ten years old, but the bulk of the bearing coffee is from six to seven and is planted rather too close to allow of the trees doing their best in crop. say seven and a half to eight feet square and topped at five to six feet. These fields of dark green coffee, covering the slopes of the valley, are really a fine sight for a planter, who has seen the best estates in Ceylon. It is difficult for an outsider not accustomed to Liberian coffee—to make an estimate of the crop on the trees, but it must come to a great deal, considering the picking goes on all the year round, There has been some correspondence in the Singapore papers about this estate and others belonging to the same propriotors calling in question certain statements which had been made about the crops. You have doubtless utilized this correspondence for your *Tropical Agriculturist*. There can be no doubt that large crops have been gathered, but there was no hesitation in admitting that they were produced by the aid of manure, so that putting them forward as an example of what the land is capable of producing in the way of coffee is not altogether a fair proceeding. Manure of the right description and properly applied can be made to produce almost anything you like in the way of crop, provided the experiment is made under favorable conditions of climate, position, &c. What capitalists want to know is what the land will do by itself unaided by manure and stimulants.

The soil of Selangor taking it all round is no better than that of Perak, especially as regards lowlying undulating country where new clearings are being opened up. In all probability a better soil will be found further away from the coast, at the foot or on the lower slopes of the higher hills. The railway is now being pushed on twenty-seven miles or so beyond Kwala Lumpur, and would be available by the time estates came into bearing, were any now commenced in the direction in which the line is being made.

In spite of the poor appearance of the soil on the knolls, the young Liberian plants are coming on fast and doing extremely well. In fact the younger estates are very promising indeed and should give handsome returns in a few years. The other property in bearing is Batu Cave estate, and here again large crops have been taken off a twelve-acre field. In the present year, as far as could be learned from inquiry on the spot, the yield will be about eight hundredweights an acre or thereabouts. It must not be forgotten that this little field is about five years old, and lies at the foot of an enormous limestone rock, in which are the famous caves full of bats' dung manure. One of these caves is open at the top, and the rain washes out the manure into the jungle at the foot. In fact this field may be said to be a " pocket" of the best possible soil, most favourably situated, with only one drawback, if it may be so termed; and that is its being on a level instead of on a slope. There are no long spells of very wet, cold weather in Selangor as there are on the hills of Ceylon; if there were, in all probability, the coffee in the field now under reference would die from "wet feet." The younger coffee on this property promises to do as well as that which is now in bearing; but in the same way as Weld's Hill the Batu estate has been manured, and the yield can hardly be quoted as a fair sample of what coffee should do unaided. On the principle of taking advantage of a favourable market manuring in order to insure handsome returns cannot be taken exception to; with present crops and current prices, a few years should give the proprietors a very handsome profit indeed. The greater part of the soil in Selangor is laterite, in various forms and stages of decay. There is plenty of limestone in huge masses cropping up in various directions. The principal rock is the white and grey granite, which seems to be present in all parts of the Peninsula. It may be added that the limestone is of very close, fine grain without presence of other gritty material; some is pure white and some of dark slaty blue. It seems rather unfortunate that the authorities at Selangor do not see their way to the appointment of a Superintendent of Agriculture, part of whose duty it would be to report upon the agricultural capabilities of the several districts of the interior of the country, with notes of climate, trees, indigenous products, &c., &c. Such reports would be of interest to all who had any wish to make investment in the country. It will be remembered that the Ceylon planters found such difficulty in pulping Liberian cherry, that it was said no pulper that had been invented was of any real use. This difficulty arose from the absence of the juicy saccharine matter so abundant in the berry of the Arabian variety. On the estates at Selangor and other places in the Straits this difficulty does not seem to exist, at any rate in the same degree as in Ceylon. It naturally requires more powerful pressure to break the tough, thick skin of the Liberian berry than the Arabica does; but when the skin is broken, the bean easily separates itself, there being a sufficiency of juicy mucilage to admit of its being squeezed out. Consequently an ordinary pulper, especially adapted for the larger berry, is made use of, and the bean can be sifted out in the ordinary Ceylon method. The pulper at Weld's Hill is an adaptation of the "Gordon's Breast" principle, the movable grooves being adjusted by screws.

Leaf-disease and green bug are by no means conspicuous by their absence, and on some of the fields powdered lime has been sprinkled over the trees, and acts in a double capacity at the same time being a manure and an agent for destroying the insects and fungus. There is but little *Coffea Arabica* in the vicinity of Kwala Lumpur, a few trees only in a native garden having fallen under observation.

It would certainly be wise before entering upon any venture of the kind in Selangor to wander further afield than the pioneers in coffee cultivation have ventured to do; that is, of course, if a permanent settlement is required. If it is thought sufficient for the coffee to last ten or fifteen years, and to get as much as possible fruit by manure or otherwise, after which it may be sold or abandoned, then, of course, by all means take the best piece of land you can get close to the source from which supplies can be drawn, say immediately around the Batu caves and on the neighbouring hills. There is plenty of fine jungle in that direction which the Selangor Government is prepared to lease or sell on easy terms, and there are roads of various kinds either made or in course of construction in all directions. Labour, no doubt, is dear, but not so much so as it was at one time, and a number of old Ceylon coolies are taking employment for a cultivation they have been accustomed to and which they prefer to learning something new as they have to do in Ceylon at the present day.

THE PROPOSED UTILIZATION OF MANA-GRASS.

We so very recently wrote relative to the proposals of the Stanley-Wrightson Syndicate as to the establishment of a factory or factories in Ceylon for working up mana-grass into the strawboard required for the manufacture of the patent tea chests, that we should have hesitated to so soon again reverting to the subject but for the information received from home by the last mail. We have thus learned that what has hitherto been but a prospect is now advanced to the position of almost a certainty. The Syndicate, when the last mail left, had resolved on submitting fourteen hundredweights of the grass just then received from Ceylon to treatment at a certain London mill for conversion into quarter-inch boards. If this experiment results satisfactorily, the Syndicate has decided to establish a Company to start a factory in Ceylon for the preparation of the raw material and to, at the same time, acquire the rights of the patentees of the Stanley-Wrightson chests and work these up locally from the material prepared from the mana-grass which covers our hill waste lands in such profusion.

This decision having been taken, and knowing as we do in what reliable and influential hands this Syndicate is, we may look forward most hopefully to the approaching commencement of operations here. These, we feel almost confident, cannot but prove to be as beneficial to their undertaking as we have every reason to expect they will to our planters and to the natives for whom a new source of remunerative employment will be opened up. As we have recently pointed out, our difficulties as to maintaining an adequate supply of wood properly suited for tea chests are now great and are certain largely to increase. The establishment of a factory for the manufacture *ab initio* of these chests on the spot will enable them to compete very readily in price with the wooden chests at present in use. The objection to some of these last we have of late had forcibly demonstrated by complaints reaching us from the trade at home. We must, therefore, be fully ready to welcome the improved prospect presented to us of an alternative at once efficient and cheap becoming shortly available. But the hopes that may legitimately be entertained need not, we are told by a friend who has made close inquiry into the matter of the manufacture of this so-called straw board, be limited to this one function of usefulness. What *papier mâché* is to the Japanese, that friend tells us, this strawboard may become to Ceylon and its people. Once the substance can be produced cheaply it may take the place of many objects for which wood is now used by us, and scarce and dear as this latter article is becoming a chance of superseding it is not to be despised.

The whole question of such comparative supersession, our friend tells us, depends upon two points only. The first of these is the cost of the raw material, the second that of—and the amount of—the power available. Given, as in the case of mana grass, an almost costless raw material,* and the unlimited power which may be derived from our upland waters, that question, our friend believes, is solved as regards Ceylon. With its unlimited supplies both of material and power it would only be a question of size and strength of machinery to turn out a board, absolutely jointless, of size and strength sufficient to form an end wall to a moderately-sized bungalow! Perhaps it may be that some day our upcountry planters may be living in bungalows altogether constructed of painted and varnished pasteboard! We are assured that there is nothing ridiculous in such an idea. Why should there be, while we know the Japanese to live in paper houses the material of which is formed by pasting sheets together. With adequate power, our boards would be both homogenous and waterproof, and by the addition of tungstate of soda during manufacture might be rendered practically fireproof. However, we must bridle our inclination to prophesy the possibilities of the future opening out to us, though when we know of railway wheels of compressed paper working satisfactorily, we can set no practical limitation to what the Stanley-Wrightson Syndicate may yet accomplish with the wild grasses of Ceylon.

* Since writing the above we have seen in the proceedings of the Haputale Planters' Association reference to a charge being made for mana-grass taken from Government patanas, but we should think areas of such grasslands would be leased on the most liberal terms to the introducers of a new manufacture.

PLANTING IN NETHERLANDS INDIA.

(From the *Straits Times*, Aug. 13th.)

The Planters' Association at Sukabumie in Java have petitioned the Governor-General of Netherlands India for a Labour Ordinance in that island, so far as mining and planting go. They also urge the passing of a law forbidding the engagement of labourers in Netherlands India for work in foreign lands, so long as the local demand for coolies in Java remains brisk. The Governor-General has returned a deaf ear to their prayers.

The Residents in Java have been officially directed to encourage the cultivation of useful fruit trees in their respective districts.

THE LATE MR. McIVOR ON CINCHONA CULTURE IN CEYLON IN 1876.

The following report, copy of which was supplied to Mr. A. M. Ferguson by Mr. McIvor, has never, we believe, been published, as it was regarded as confidential. It will still be read with interest as illustrating the history of a great and in certain senses a successful enterprise. We may say that ultimately the Poomong plantation, alluded to by Mr. McIvor, turned out a very successful enterprise, and that on the British plantations in Sikkim Mr. Gammie has been very successful with the yellow barks, including ledgerianas.—ED. *T. A.*]

Government Gardens,
Ootacamund, 9th May 1876.

From W. G. McIvor, Esquire, Supdt. Government Cinchona Plantations, to J. R. Cockerell, Esquire, Commissioner of the Nilgiris, Ootacamund.

Sir,—With reference to G. O. dated 27th January 1876, No. 239, I have the honor to inform you that on the 10th February last I proceeded to Ceylon to ascertain the condition of Cinchona cultivation in that Island. During the last three years a large extent of land has been brought under Cinchona cultivation by private planters; but prior to this period only a few acres were put down on Coffee Estates here and there, while on many Estates the boundaries are marked off by lines of Cinchona trees.

2. I shall first notice the plantation of the Ceylon Government at Hakgalla, begun in 1861 under the able management of Dr. Thwaites, the Director of the Botanic Garden at Peradenia. This plantation is now under the immediate superintendence of Mr. E. J. Thwaites. The site has been selected with great judgment; it lies near the East limit

of the South-West monsoon, and therefore receives the South-West and North-East rains, but in moderate quantities only. The elevation is from 5,200 to 5,500 feet, situated six miles South-East of Nuwera Eliya, and is well protected from the South-West by mountains rising to upwards of 6,900 feet. In this favourable position Dr. Thwaites succeeded early in 1861 in raising 350 plants of Red Bark (C. Succirubra) and 1Ꝑ0 plants of Grey Bark (C. Micrantha and Peruviana), which together with plants of other varieties made 800 in all. These were the first Cinchona plants raised in Ceylon. In the same year the Yellow Bark (C. Calisaya) was received from Kew. In 1862 there were in all 2,434 plants at Hakgalla. In October 1865, these had been increased to 354,026. In 1862, 194 Red Barks, and 110 Grey Barks were placed in permanent plantations. In 1863-'64 the plants in permanent plantations were increased, the Red Barks to 1,345, Crown Barks to 1,474, Grey Barks to 300, and Yellow Barks to 82. After this date there seems to have been but little extension of permanent planting, as the object of the Ceylon Government was not to produce bark, but to multiply the best varieties of Cinchona plants in order to meet the great demand of the enterprising and energetic Planters in the Island.

3. At the date of my visit the plants in permanent plantations at Hakgalla were from 12 to 14 years of age. The Red Bark plants were healthy with a growth resembling that which obtains on the Neilgherry Hills at similar elevations. The Crown Barks were less healthy, a considerable number had died, perhaps one-tenth, and many were affected with canker. The Yellow Barks of the early planting were all in an unhealthy and unpromising condition. This was also the case with the Grey barks. In Ceylon as with us last winter was one of exceptional severity, and at the date of my visit some of the plants at Hakgalla had been injured by frost, and all of them had suffered more or less from the cold and exceptionally severe drought. They were therefore not seen to advantage. The surface soil is rich and fertile, but, unfortunately it is shallow, and when the roots penetrate into the subsoil, the growth becomes less vigorous, and the plants less healthy. This I fear in many of the localities in Ceylon will prove an impediment to Cinchona plantations attaining a great age and will possibly necessitate the cutting down of the trees in the earlier stages of growth. Mossing has been tried to a small extent, but the necessary precautions seem to have been omitted in its application.

4. Seedling Cinchona plants spring up in myriads all over the plantations and under the trees on the neighbouring forests. Advantage has been taken of these to form stock plants for propagation, and I was much impressed with the great success attained by Mr. E. J. Thwaites in the propagation of cuttings in beds, formed in the open, and simply covered with coir-matting, placed on a pandal about 18 inches above the ground. The skill shewn, and the attention bestowed by Mr. Thwaites on the propagation of the plants has been rewarded by unequalled success. On looking over the unrsery beds it appeared to me that not one cutting in a hundred had failed.

5. Coffee Planters have entered into the cultivation of Cinchona in Ceylon with much zeal, and foremost in their ranks stands Mr. Corbett. This gentleman in 1862-63 formed a plantation of 3 or 4 acres on the famous Rothschild Coffee Estate, and also planted avenues along the main roads, and here and there lines of Cinchona trees among the Coffee plants. I understand that Mr. Corbett afterwards opened a tract of land for cultivation in Dickoya, and is now opening a large tract near Nuwera Eliya. The Rothschild Estate is situated in Pusilawa at an elevation of 3,200 feet. The plants are principally red bark, and the growth is fairly satisfactory, much resembling the growth of this species in the Wynaad. The plants I observed on other plantations in Pusilawa and in Rambody were much in the same condition. On the Nana-oya Coffee Estate, situated in Dimboola at an elevation of about 4,000 feet, is a very fine patch of about 4 acres of red bark. Here the plants were very healthy, and had made perhaps more vigorous growth than any I saw elsewhere. Some Crown barks also had been planted on the same patch; these however were unhealthy, the greater part having died, and the few remaining plants were all more or less affected with canker, and this I found to be the case with all the old Crown bark plants which I saw at low elevations in Dimboola.

6. In September 1873 a number of the larger Succirubra plants on Nana-oya were coppiced and the bark sent into the London market. Those plants have thrown fine vigorous shoots from the coppiced stools averaging about 7 feet in height, so healthy and vigorous that they give promise of a fair return by this method of cultivation. The ordinary size of the coppiced stools is 12 inches in circumference, and the largest I could find was 25 inches in circumference at a foot from the fround.

7. There are a number of very fine young plantations in Dimboola, especially on the higher portions, but, as the plants had only been in the ground 2 or 3 years, it was impossible to form any opinion as to their permanency.

8. Lool Condura is an extensive Cinchona Estate situated in Lower Hewahette and under the able and skilled management of Mr. Wi liam James Taylor. Here a large extent of land is now under Cinchona cultivation, and the young plants are healthy, and promising, although here and there the symptoms of Canker are evident in plants 3 and 4 years of age. The older plants on this Estate seemed to me in an unpromising condition, especially the Crown and yellow barks. On this property the cultivation was maintained in an exemplary manner, and every care and attention bestowed on the plants.

9. On the New Forest Estate, at a high elevation I observed some of the most healthy old crown bark trees which I saw in the Island; so far as I noticed there was scarcely a trace of disease among these plants.

10. On a consideration of all I saw in Ceylon, I was impressed that the cultivation of red barks in well-selected localities may be made profitable and to a certain extent permanent. With Crown barks the difficulty will be greater. The position of the plantation must be selected with great judgment if permanency is required, but if the intention is simply to grow the plants for 5 or 6 years, and then cut them down for the bark, the result would be different, and this system of cultivation may prove remunerative. The cultivation of the yellow and grey barks did not promise either permanency or profit. As a whole the plants in Ceylon are inferior to those grown on the Neilgherries, although the growth of the red bark is more rapid at low elevations in Ceylon than with us, but the deficiency of a rich deep surface soil, and the nature of the subsoil will, I fear, (with only a few exceptions), render cinchona cultivation somewhat hazardous.

11. On the 11th July 1866 Mr. J. Eliot Howard in submitting an Analysis of Ceylon bark observes, "I must remark in the first place that they contrast disadvantageously in appearance with the

specimens of cinchona bark received from Mr. McIvor. It looks as though the climate of Ceylon were less favourable than that of Ootacamund for the cultivation of this plant. No. 1 in particular, and next to this No. 3 would be considered poor and badly grown barks in commerce, and moreover they have not had the advantage of mossing which tends so much to increase the product of the alkaloids." Time appears to have established the correctness of these observations. In appearance the Ceylon barks are thinner, and deficient in the markings which are valued in the home market, and although these barks are really rich in alkaloids, they are in this respect also a little inferior to the barks of the Nilgiris.

12. On my visit to the Cinchona plantations of the Bengal Government in 1871, I observed disease in the plants and certain conditions of soil and climate, which forced on me the conviction that cinchona would not form a permanent and profitable cultivation in British Sikkim. My report detailing these facts was unfavourably received by the Government of India, the Bengal Government, the local authorities in charge of the plantations in British Sikkim, and especially condemned by Mr. Munro, the Superintendent of the Poomong plantations of the Darjeeling Cinchona Association. Time seems however to have led the Proprietors of the Darjeeling Association to acquiesce in the conclusions arrived at in my report of 1871, as I observe that referring to the Poomong plantation the *Darjeeling News* says:—"The present owners of this large cinchona garden, Major-General Angus and Mr. Lloyd have spent a large amount of money on the estate which was commenced some 14 years ago, and up to date received no return. The Government has larger cinchona gardens alongside, and may be said to have swamped the private enterprise. Any way we learn that the Superintendent of the Garden has received orders to cut down the trees and send the bark to the London Market. The trees are to be destroyed so as to get the bark from the roots, said to be rich in alkaloids, and the land is then to be put up in small lots for public sale among the tea planters. In this way the owners expect to get back the R325,000 they have spent, though they will never see the interest of the money they have been spending all these years. It seems a pity to destroy what has cost so much time and money. One would have thought that these gardens, which had been made far cheaper than any others in India, and were a great success would have paid well, but it seems that cinchona is not a paying speculation." I believe that the work of destruction has begun, and in a few months 1,800 acres of our Indian grown cinchona will have disappeared. I mention this fact as it may be worthy the consideration of Government when deciding what permanent course it may be desirable to adopt in reference to the disposal and future management of our plantations. I have &c.,

(True Copy.) (Sign W. G. McIvor.

MR. McIVOR ON TEA AND CINCHONA IN CEYLON IN 1876.

The following letter by Mr. G. W. McIvor, amongst the last he wrote, was addressed to Mr. A. M. Ferguson, senior, and will be read with interest, now that cinchona in Ceylon has had so vicissitudinous a history, and that tea has become, as McIvor anticipated, a great success:—

Ootacamund, 11th May, 1876.

My dear Mr. Ferguson,—I was very much pleased to get your letter of 27th April, and although I missed you in Ceylon, I fully expected to have the pleasure of seeing you here, and regret time would not allow you to pay us a visit. I hope however as you suggest you will be able to finish off our Indian trip, by a visit to the Neilgherries.

Your son and nephew both showed me much kindness when in Ceylon, and were of great assistance to me, and I hope you will come over, so that I may show you what we are doing both here and in the Wynaad, in coffee, tea and cinchona.

I was much pleased with the tea, I saw in Ceylon. It offered promise of success, and you have some fine varieties which, if propagated from cuttings, would give fine stock. The finest kinds I saw were on the New Forest estate, and as these were large trees, any number of cuttings could be procured from them. You will have learned a great deal about tea during your trip to the North. It is likely to prove a profitable investment here also. The fact is the plant is very hardy and thrives best in a wet climate.

I could not understand until I visited Ceylon how it was you could not grow coffee at a high elevation, say 6,000 feet, as we have same fine coffee estates at that elevation; but I find that it is the wet climate of Ceylon, which causes plants not to bear at high elevations, and it is the same on the wet side of our hills also, where plants above 5,000 feet bear little or nothing.

* * *

It rained nearly the whole time I was in Sikkim, and you were fortunate to have had fine weather there; the fact is, as I stated at the time of my visit, Sikkim is unsuited for the growth of cinchona, the latitude is too high, the soil too thin and the climate too damp. I saw patches of 30 acres together with scarcely a healthy plant. As you will see when you come over here, our plantations are quite different; of course I do not like to depreciate the labours of any one, but we are bound to speak out, because if the conditions are unfavourable the results must be unfavourable, however skilful the management.

I am glad you have had favourable rains at Abbotsford and that you already have begun to plant. I was much pleased with the place, and especially the fine garden and house. Dimboola seems to have an excellent climate.

I have no objection to the cultivation of ledgeriana as it is a variety of great value, and if it was suited to our climate, I would cultivate it as extensively as they are doing in Java, but here it is quite useless, it is unsuited to the climate and liable to disease. With you I fear it will be the same. This plant is found in Bolivia, between 15° and 16° south, Java is also south about 6° or 8°, and the plant does better there, but I am informed that it is even there very liable to disease.

I will prepare a case to send over to your son some of our best plants. It will be better to send them in a wardian case. I left with him seeds of all the best varieties we have.

In Ceylon you are north of the line. The varieties which do with us are likely to do with you also. However, there can be no harm in trying the different varieties of calisaya, but all the plants I saw in the island are unpromising, and I fear it will only be time and labour wasted.

I am sorry to say that I have been seriously ill. I had a great deal of exposure after my return from Ceylon, and got laid up with liver and dysentery from which I am but now slowly recovering.* * * * —Believe me, yours very sincerely, W. G. McIvor.

* The recovery was but temporary, a relapse ending in the death of this able and useful man.—Ed. *T. A.*

MR. CLEMENTS MARKHAM ON CINCHONA IN CEYLON.

The following letter addressed to Mr. A. M. Ferguson, senior, by Mr. Clements Markham, whose name is so honourably associated with the introduction of the fever plants of the Andes to India and Ceylon, forms an interesting supplement to Mr. McIvor's report :—

India Office, S. W. April 27th, 1876.

My dear sir,—I have to thank you very much for kindly sending me the interesting photographs of the cinchona trees on the Dimbula estate, and for the pamphlet on the climate of the locality where they are growing. You will be able to obtain seeds of *C. Calisaya* from Mr McIvor, at Otacamund; but I think *C. Officinalis* is the best for Ceylon, and will always fetch a high price from quinine manufacturers. The *C. Succirubra* (red bark) is the best of all in a utilitarian point of view, because it yields the largest percentage of febrifuge alkaloids; and it is certain that cinchonidine, its chief product, and the other alkaloids, are as efficacious as quinine. But it will take some time to overcome ignorant prejudices among doctors in England on this point. About this I am now taking a great deal of trouble, and I have already got the excellent febrifuge medicine from the red bark, manufactured by Mr Wood at Calcutta, introduced into the London hospitals.

I am sorry to say that the authorities here, since the change of ministry, object to the full information given in my "Progress Reports"; and have taken their preparation out of my hands. Now a mere abstract of reports received from India is prepared by a clerk. It is a sad pity.

I shall, however, be glad to receive from you any Reports respecting cinchona and coffee plantations in Ceylon which I could utilize in other ways.

We have already got all the best kinds of Calisaya, including the variety Ledgeriana; and plants or seeds can be obtained from the Nilgiris; so that it would be a waste of money to send again to South America.

Ever yours very truly,

CLEMENTS R. MARKHAM.

PLANTING IN DELI.

(From the *Straits Times*, Aug. 13th.)

The Deli *Courant* of the 2nd August can hazard no definite opinion as to the prospects of this year's tobacco crop. No wonder when even experts differ in the forecast and find it hard to foretell the turn of events. The disturbing element in the calculations arises from a recent long drought in the planting districts, and many growers fear that they are much the worse for it. So far as appearances go, the coming crop will fall below the average in quantity, but a few smart showers in the present month may materially improve the outlook. Langkat, this year, has fared better in weather than Deli where several estates, in consequence of early planting, have turned out very badly. Upper Serdang, too, has lost heavily by the drought, but Bobongan not at all. In Assahan, there is every prospect of getting 6 to 7 piculs from every field, but Siak, save on an estate or two, makes as dismal a show as in the past. Planters report favourably on crop prospects in Labuan Batu. The drought has taken effect in a predominance of dark quality in the yield. In fermenting the product, the managers will be hard put to it how to give their tobacco that light coloured appearance which alone takes with consumers in Europe and America. Though planters can do little in this line, shareholders and directors in Europe will not see it, and continually cry out for the more taking colour, and complain of other estates being more fortunate in this point than theirs. A manager who gets put out by this becomes a marked man. Managers too find a big estate with hosts of coolies no easy matter to handle. Experience has proved that the size of an estate has its limits to admit of profitable working. Four hundred fields to an estate seem to be the maximum limit, which cannot safely be overstepped. The Deli Company has profited by it, and its managers show that they do not hesitate to curtail extension when circumstances prove adverse. Other managers manifest less prudence and to deem the more coolies in the fields the merrier, but the results of such unreasonable extension speak sufficiently for themselves to deter others from following the example.

In Assahan the planting outlook takes such a bright appearance that applications for railway concessions there begin to be talked of.

Two East Sumatra planters have just been called upon to answer for themselves before the Criminal Court at Batavia on charges of illtreating coolies. Facts like these happening now and then come in handy to those who want to make out that planters on the East Coast of Sumatra are a rough lot, given to harsh dealing with their labourers. But it should be borne in mind that this report only holds good in newly opened districts, where the absence of police and the weakness of government authority lessen security. Planters finding themselves in the midst of coolies mostly of bad character as well as naturally turbulent and unruly, have to depend upon themselves to keep order among such a mixed multitude. That under such circumstances they should take the law into their own hands and administer rough and ready justice is nothing surprising. They may be mistaken in so doing, but the Government must bear the blame of driving them into it, by neglecting to station police in districts which planters and coolies have begun to open out.

A TRAP TO CATCH THE INDIAN MARKET.

(BY THE "PERIPATETIC PLANTER.")

An attempt is being made to get Indian tea dealt in in the Clearing House, like China teas. A few days ago, a number of representative importers and Indian tea brokers were invited to meet the authorities of the Clearing House, it was understood by those invited, to discuss the feasibility and advisability of Indian teas being so dealt in. No sooner had they entered the room, however, than they were informed that the feasibility was already decided; and, moreover, that Indian tea would be dealt in from the 1st Oct. next! Some had held aloof from attending, but a good many were induced to attend under the idea that it was well at all events to hear what could be said in favour of the scheme and not to abstain out of mere prejudice or preconceived notions; the more so, as they were led to understand that the conveners of the meeting promised a way to improve the Indian market, attempting enough bait. This readiness to be convinced will show, that if the scheme fails to obtain the support of those who have heard its details described, and who at the same time were deemed experts—or they would not have been invited—the scheme should be looked upon with suspicion at least, if not condemned offhand by those who, whilst interested, were not able to attend the meeting. Instead of suggesting any means of introducing new capital or legitimate new development of real business, it at once became evident that Indian Tea was merely to be made the battledore and shuttlecock of a small group of speculators, like China Tea. There were to be 5 or 6 "types" as standards, and a committee of valuers and so forth. A very little consideration has already induced a good many of the Importers and Brokers present at that meeting to already withdraw their names from the enterprise; and the

belief is held that most, if not all, will soon do the same. It is the opinion of some of the objectors that the scheme is a mere trap into which to drag Indian Tea to the ultimate advantage of China Tea. It should be understood, to make the reasons for this opinion clear, that outsiders are rarely tempted to speculate in tea, and that the market thus made is the sport of a small group who play shuttlecock with contracts between themselves, and create a fictitious quotation at their own sweet will. Thus they can at any time send up the prices. It is not by any means impossible that the uncertainty thus created in the case of China Teas. has not done much to disgust Grocers with the vagaries of China Teas of late,to the great advantage of India Teas.—*Indian Planters' Gazette.*

THE KOLA NUT AND ITS PREPARATIONS.

Amongst the vegetable products of the Great Dark Continent, perhaps none are more interesting than those which, under the various names of *kola, gourou, ombéné, nangoué*, and *kokkorokou*, are used as articles of consumption throughout tropical and equatorial Africa, and for preparing beverages equivalent to our tea, coffee and cocoa. African explorers have often described the uses of the kola nuts. They are used medicinally in the cure and prevention of disease; they play an important part in the social customs of many of the tribes, figuring as emblems in the formalities of declaring war, making peace, and marriage. So high a value is placed upon these nuts in certain parts of Central Africa, where they are not grown, that they are readily purchased for an equal weight of gold-dust. The kola nut is the fruit or seed of the *Sterculia acuminata*, a tree which grows to a height of from thirty to sixty feet, and in its general aspect resembles that of the English chesnut tree. There are at least two varieties of the kola, so-called, which are yielded by two families of plants, and differ very much in appearance, but the kind which is most widely distributed is the "true kola," which is called by some of the natives the "female kola." The true kola grows wild upon the western coast of Africa comprised between Sierra Leone and the Congo or Lower Guinea, and extending inland some five or six hundred miles, when it appears to follow the limits of the palm. It is also found growing wild in the country of the Momboutous (24° E. long., 3° N. lat.), and in the moist hot woods near the southern coast of Venezuela, but is believed to have been sown in this latter country by African negroes about the same time as it was introduced in Martinique.

The kola tree commences to yield a crop about the fourth or fifth year, and by the time it is ten years old the tree is in full bearing. Like the orange tree, the flowering is continuous, blossoms and fruit occurring at the same time. The crop is gathered in October and November, and again in May and June. The ripe kola nut consists of a brownish-yellow capsule, inclosing both red and white seeds, which vary in number from five to fifteen. They are collected with great care by women, who remove the husk and episperm and pick out all damaged seeds. The sound seeds are placed in large bark baskets lined with "bal" leaves, and then are ready for transport. In Africa, the kola nut is an important commodity in the caravan trade, and the great centres of this trade are in Goree and Gambia. In the form of a dried powder these nuts find a ready sale at fabulous prices even so far away as the remote Soudan and Timbuctoo. In addition to those native uses of the kola to which we have already referred, it is used, fresh, as a "masticatory," for improving foul water, and for rendering tainted meat edible, also for enabling persons to undergo prolonged exertion without fatigue. Some of the tribes of the interior make a very agreeable, stimulating and nourishing beverage by mixing the powered nuts with milk and honey. As to the chemistry of the kola nut, this has chiefly been investigated by Heckel and Schlagdenhauffen, who have made a large number of experiments. The dried seeds were finely powdered and treated with chloroform, and also exhausted with alcohol and boiling water. In each case a careful examination of the matters taken up in solution was made. These analyses revealed high percentages of caffeine (the active principle of tea and coffee) and theobromine (the active principle of cocoa), and at once suggested the suitability of preparing a beverage from kola nuts, of the same character as tea, coffee, and cocoa. And in view of this it is instructive to compare typical results obtained in the analysis of these substances. In each case the authority is given.

	Cacao (Mitscherlich).	Coffee (Payen).	Green tea (Peliglot).	Black tea. (Peliglot)	Kola (H. and S.).
Fat	53·00	13·00	0·28		0.585
Proteid matters	13·00	13·00	3·00	2·80	6·761
Theobromine ...	1·50	—	—	—	0·023
Caffeine	—	2·25	0·43	0·46	2·348
Essential oil ...	0·40	0·003	0·79	0·60	undet.
Resin	—	—	2·22	3.64	—
Sugar	0·5 }	15·50	—	—	{ 2·875
Starch	— }				{ 33·754
Gum	—	—	8·58	7·28	3·040
Cellulose ...	—	34·00	17·08	26·18	29 831
Colouring matters	—	—	17·24	19·20	2·561
Ditto	5·00	—	2·22	1·84	1·290
Extractive ...	—	—	22·80	19·88	—
Tannin ...	—	—	17·80	12·88	1.618
Ash	3·60	6·697	5·56	5·24	3·395
Water	6·00	12·00	—	—	11·909

We may fairly conclude that the yield of caffeine from the kola nut is greater than in most commercial teas and coffees, and that the proportion of theobromine is greater than that contained in cocoa. By a special process a paste is made from the nut, called kolatina, which produces a refreshing and sustaining drink with boiling water or milk. It is also stated that kola is of use to tea-tasters in counteracting the effects resulting from their occupation, and that it can be used for "improving" low-grade cocoas. The analytical table shows that kola does not contain anything like the quantity of tannin that tea does, nor the fatty matter that cocoa does; hence people having weak digestions will find none of the inconvenience in the use of kola preparations which they experience when they take certain other beverages.

If kola paste is mixed with cocoa it gives a chocolate of good quality, which is nutritious, and, according to the chemists, five times more sustaining than cocoa. Kola chocolate again is said to be ten times more nutritious than the best kinds of ordinary chocolate. Mr. T. Christy, F.L.S. &c., to whom the introduction of the kola into this country is due, has a large number of testimonials from cyclists, journalists, and others, which speak in terms of praise of the beneficial effects of using kola preparations during extreme muscular or mental exertion. Kola was used by the director of telegraphs of Egypt on his journeys into the Soudan, when bulky stores could not be carried. The French Alpine Club has just adopted it as a stimulant and nutrient in their mountain-climbing expeditions. The German War Office has recently ordered thirty tons of the nuts, owing to the beneficial results of experiments with them during the autumn manœuvres of last year. The British Government are also giving their attention to the kola preparations. Kola is made up in various forms: first, there is the kola paste, or kolatina: then it is made up in tablets as kola chocolate. According to the *Cycling Record*, "it is a fact that a single cake of kola chocolate contains sufficient nourishment for a cyclist to ride from morning till evening without requiring other food." Another from is the kola lozenge, which can be carried in the vest pocket. There is also a kola cordial; and Mr. Christy is shortly going to bring out a kola "cocoa" and a kola "coffee."—London *Grocer.*

VULCANIZING TIMBER.

The *Indian Engineer*, in writing on railway sleepers, says:—

The only way in which inferior descriptions of timber can be made useful is by using some preservative, and great interest has been taken in this matter by the American Forestry Congress, who were specially appointed to consider the best method of relieving the forests from the heavy calls made upon them for sleepers, trestles, and other railway works. Kyanizing, Creosoting, and Burnettizing, have each been found wanting, but "Vulcanizing" bids fair to prove a success in every way, and it is thought that the difficulty has at last been grappled with. The *Inventor* says of this process:—"The curing or *drying* of wood until the discovery of the vulcanizing process, had received no new idea or improvement from the earliest time; while in the matter of working other materials, such as the amalgamating of metals, the making of steel, &c., the records of the past century show a marked advance; but for wood, the greatest product, the consumption and uses of which overshadows all other useful products of the earth, substantially nothing of any value has been accomplished." To properly preserve and cure wood and lumber, we have only to consider a few simple and self-evident facts. In its growing state wood is stronger and more elastic than when dry. It contains in its fluids all the antiseptic qualities and elements of self-preservation. The tree in the forest, exposed for centuries to atmospheric changes, does not decay; but gird and deplete it of its fluids and the disintegration of the fibre commences. This then is the basic idea upon which the new discovery of vulcanizing is founded, and the results obtained accomplish more than is claimed by all previous inventions and discoveries. In the application of the vulcanizing process a cylinder made of boiler plate, one-half to three-quarters of an inch in thickness, sufficient to withstand a pressure of two hundred pounds to the square inch, is used. This receptacle is made of any desired length and diameter, according to the number of feet of lumber required to be treated daily. The wood is piled on small iron cars, in a shape to conform to the coutour of the cylinder, and the cars are then run into the tank on small rails fastened in its bottom. A number of cars are made into a train sufficient to charge the tank, and the door is closed making an air-tight fastening. From a large compressor air is pumped through pipes into the cylinder until the gauge registers the desired pressure, varying from 100 to 175 pounds to the square inch. After leaving the compressor, and on its way to the tank, the air, by a system of pipes, passes through a small stove or furnace and is heated to the required temperature—varying from 400 to 600 degrees Fahrenheit, according to the kind of wood in treatment. The air pressure holds the sap or fluids in the wood, effectually preventing their evaporation, or the charring of the fibre of the wood, while intense heat passing through and clear to the centre of the stick, so sublimates and attenuates the fluid matter of the wood that a new compound is formed, or rather the constituent elements of the sap are now in combination which otherwise are, under lower and different degrees of heat, distilled separately. All preconceived methods of curing timber are here reversed, and instead of distilling out these valuable antiseptics, they are distilled in the wood itself, a sufficiently high degree of heat being used to allow of their complete affiliation as a new and oleaginous compound. The heat and pressure then being removed, the door is opened, and the tank is emptied and ready for the next charge. Thus it will be observed that no foreign material being necessary, the process is not only rapid but so inexpensive as to recommend its adoption to all users of wood. When the timber is removed from the cylinder, the new compound now permeating the entire fibre, a chemical change or oxidation takes place while the wood is cooling down, rendering it impervious to moisture, never affected by the changes of the atmosphere, or the alterations of wet and dry; consequently it cannot rot; cannot shrink or swell; offering no point of attack like seasoned or kiln-dried lumber; its pores are filled with its own material,—a material composed of the best known antiseptics, and in such shape as not to be soluble in water. Wood vulcanizing, from ample proofs during the last seven years, establishes the fact that it not only prevents the rotting of wood in the most exposed situations, but also prepares any kind of green wood for immediate use. Vulcanized cross-ties (sleepers) can be supplied in America at a cost of from 40 to 80 cents each, according to locality and variety of wood, and will last at least 30 years.

Cotton-wood is the worst wood known for railway sleepers, but it is claimed that by vulcanizing this wood it can be made as durable as the best oak.

Taking the prices quoted for this process in America, we should be able to vulcanize deodar, or any other soft wood, sleepers at a cost of Re 1 each, and as the present price of this class of sleeper—for broad gauge lines—is from R3-4 to R3-8, the total cost of vulcanized sleepers would still be ten per cent lower than is now charged for *sâl* sleepers.

POSITION OF THE CHINA TEA TRADE AS COMPARED WITH INDIA AND CEYLON.

Foochow, 21st July, 1890.

To the Editor of the "Foochow Echo."

DEAR SIR,—I am sure that we are all under obligations to you, for the interesting articles on the tea trade of this port which have lately appeared in your paper, and I beg your forbearance whilst I make a few remarks on that in your issue of 19th instant. And firstly, as the author of the original article which appeared on 5th instant, allow me to thank you for the gratuitous addition by you of the words "Communicated," and the introductory and deprecatory paragraph which you so *kindly* inserted regarding it. Curiously enough, I cannot find either of these two "additions" in your last issue pertaining to what I may presume to be a reply to my remarks.

May I assume from this that you endorse and adopt the views contained in that reply? I will be as brief as I can in my review. I pass over the first portion of your article and come to the question asked therein "Are our teas so very bad after all?" Then follow the words "We only know this that there are several markets in the world which will still have them, and *no others*." Why not name those markets? If Australia is alluded to, I must ask what means the export from India and Ceylon of some 4 millions of pounds to that Continent? What mean the figures in Greig and Murray's Circular of 28th May last? Stock in bond 24th May, China 3,408,389 lb., Indian and Ceylon 1,031,895 lb.

If America and Canada be meant, there is no foundation for the statement, because Messrs. Gow, Stanton & Co. of London, assert in the public papers that the consumption of Ceylon Tea is spreading quickly. If the "Cape" be meant, the statement is probably true, but affects only a total quantity of about 1¾ million pounds. As for saying that in London in spite of the tyrant "fashion," they cannot do without them, see what Rucker and Bencraft in their Circular of 5th June last say, "The increase in the deliveries of Indian, 10 millions, and "Ceylon," 8 millions=18 millions *has displaced* 18 millions of China Tea." I come now to the paragraph speaking of the marked superiority of the Souchongs and Soomoos this season, and arguing therefrom that other kinds may improve in the future.

Souchongs, formerly a very paying item in the London Trade, have now, alas, become of very slender importance, the taste for them dying out, and the losses on their shipment last season being exceptionally heavy.

Soomoos and Chiangloks are it is true superior to last seasons, but they form but a small proportion of our crop, for out of a total of 312,000 chests of Congou to hand up to date, they only number 26,000 chests.

Per contra, I may ask, are the Saryunes superior to last seasons, or the Suey Kuts, or the Yung Hows, or

the Paoklings? Decidedly *No*, and your contributor admits the inferiority of the Packlums and Panyongs, which latter figure for 128,000 chests out of the total of 312,000.

Now for the remarks concerning India and Ceylon. Granted that the rise in exchange will prejudically affect returns from estates, but it will not do so to the extent hinted at in the question asked by your contributor, "*How about the Dividend?*" Let us take the case he instances. An estate producing Tea to sell in London for £10,000, must yield some 220,000 lb. weight. To give that, the estate should be say 800 acres, the expenditure on which would be about Rupees 50,000 per annum. Take a loss of 15 per cent on that sum we have only Rupees 7,500 or say £650, which is about 6½ per cent only on the sum realised for the Tea. So that, to go further, assuming that the capital required for the above estate to be £30,000 we have *under* 2¼ *per cent* as the actual loss in dividend arising from a rise in Exchange of 15 per cent. As to your contributor's remark that we have not much to fear from Ceylon in "*the long run*," I can afford to pass it over, facts being stubborn things, and proving that the decline in the China Tea Trade is due in a great measure to the increase of Ceylon Tea. Tea is a hardy plant, and one which nothing seems to injure, not even the utter neglect of the Chinese;—why then when it is cared for scientifically should it, "*in the long run*," meet disaster in Ceylon? Touching on the drawbacks alluded to by your contributor as those which China Tea has to contend with, I notice he mentions *a higher rate of freight*. A glance at the Colombo papers would have shewn him that freights there are as often 30/- to 40/- per ton for tea, as in China.

"*The Chinese are wonderful adepts at meeting the inevitable*," continues your contributor. Granted, but not in the spirit in which the article views the point, the inevitable means rather the decline of the Trade, witness the descent from 800,000 chests, 12 years ago, to a probable 360,000 chests this season. This is indeed adapting themselves to the inevitable! Again, the rate of wages paid to the pickers in this country, we are assured on good authority, cannot well be lowered, it is paid on the amount plucked per day by the picker, and if the production of Tea continues to decrease it follows that fewer pickers will be needed. As it is, the plantations on which any labour but that of the owners family is used, are already few and far between. Only with the introduction of railways and the abolition of the Lekin tax will the cost of carriage to this port ever be reduced. I come now to a still more sweeping statement in the article under notice. It is that "If we cannot beat India and Ceylon in the matter of the very peculiar flavours imparted to their Teas *through the unsavoury manures they use*, we shall at any rate be able to compete with them and perhaps outdo them, in the cost of production."

Your contributor evidently knows little of the subject concerning which he makes such bold statements. Will he be surprised to hear that not *one twentieth* of the acreage under Tea in Ceylon, *ever receives any manure, savoury or unsavoury*, and that he must therefore seek elsewhere for the reason of their peculiar flavours?

Might I ask him what unsavoury manures are used in China to produce the marked and peculiar flavours shown in the comparison of a Tong Foong Tong and a Panyong, or a Saryune and a Packlum?

From all one can learn, and it is at best perhaps, somewhat unrealiable, the reduction of the *cost* of producing tea in this country, has, excluding the subject of Lekin and taxes, reached its limit.

I will conclude by disclaiming any desire to injure the trade of this port, but rather assert that it is only by baring our wounds and endeavouring to find their remedies that we can hope ever to see a healthier state of business.

Apologising for trespassing so much on your valuable space.—Yours faithfully,

FIAT JUSTITIA, RUAT CŒLUM.

THE FINANCIAL AND GENERAL POSITION OF PERAK,

as exhibited in the report of the British Resident for 1890 shows that

The Revenue of the State amounted to $2,776,583, a sum $236,876 in excess of the Estimates and $766,343 over the actual revenue received in the previous year.

The expenditure for the year amounted to $2,090,116, a sum $223,634 less than that voted in the Estimates. The year's expenditure was $686,466 under the year's revenue.

The trade returns for the year give the following result:

		$	c.
Value of Imports	... ...	7,048,045	78
Do. Exports	... ...	10,812,673	00
Total	...	17,860,718	78
Decrease over value of Trade in previous year...	... ...	1,937,298	51

The decrease is more apparent than real, for there is reason to believe that the statistics of previous years were not thoroughly reliable and, owing to the price at which tin (the chief export) is officially valued, the returns of 1889 show a decrease of $850,000 on this item while the actual export exceeded that of the previous year by 16,812 piculs. There is also a decrease of $850,000 on the import of specie.

The excess value of Exports over Imports is noteworthy.

From the 1st September Mr. Spence Moss was appointed Government Engineer for Railways in Perak as well as Selangor, and gave his attention to the surveys for the proposed Kinta Valley Railway.

The total area of land alienated to the 31st December last was—

Mining Land	..	11,995	acres.
Agricultural	..	145,674	acres.
Town Lots	..	4,829	lots.

During the year 6,500 acres of land were demarcated, against 2,600 acres in the previous year; 10,000 acres were surveyed against 8,000 acres in 1888.

In all districts of the State, except Krian, the difficulty is to keep pace with applications for land so that even temporary titles may not be issued until the ground applied for has at least been demarcated. It is by no means possible to do this, for in the Kuala Kangsa District 2,982 lots of new land were alienated during the year, and in Batang Padang 1,326 acres of mining land were given out, though undemarcated.

The most notable features of the year are that the experiment of pepper cultivation, begun in 1885, with the sanction and approval of His Excellency the present Governor, has proved so successful that there is a general desire, not only in the Kuala Kangsa District but elsewhere, to take up large quantities of land for this purpose. The danger is rather that some who have undertaken this cultivation without much knowledge should be discouraged by the time which must elapse and the trouble that must be taken to nurse the vines before any return can be gained. There are many thousands of acres in Perak admirably suited for pepper, and it is difficult to over estimate the advantages of making this cultivation generally popular with our large Malay population.

The success of Liberian coffee has been demonstrated by Messrs. Hill and Rathborne, who have done so much for agriculture in the Native States. Their Kamuning Estate, in the Kuala Kangsa District, promises to be finest Liberian Coffee Estate yet opened. An experiment in tobacco proved that a leaf of excellent quality could be grown in Perak, and I trust that efforts will not be relaxed till it is also shown that the cultivation of this plant can be made a financial success.

A Chinese has taken up a block of land in Larut on which he proposes to grow mulberry and rear silkworms. The mulberry trees grows here like a weed and the experiment is one of much interest; if successful, the Malays, who are skilful weavers, would probably take to it as a congenial industry.

A sample of tea grown in the Government Plantations was sent to London, and very favourably reported upon, while the future of Arabian coffee is so far as-

sured that I am told the only estate in existence in Perak (Waterloo) showed a profit on last year's working, and its experienced Manager (Mr. Fraser) expresses a most decided opinion in favour of Perak as a coffee-growing country. As an independent and reliable opinion on a subject of much interest I quote Mr. Fraser's words:—"The cultivation of coffee promises well and, where land is judiciously selected and opened, it cannot fail, in my opinion, to be a success."

The sugar estates of Krian exported 59,763 piculs during the year, and as the price has improved on the very low figures of past years it may be hoped that there are fair prospects for cane growers.

I am, however, specially pleased to be able to report that throughout the State (always excepting Krian District) a larger area of padi (rice) has been planted this year than for many years past and so far the harvest promises to be an unusually good one. I have had special opportunities for seeing this myself and the native headmen are all agreed on this point. I still think it would be an immense gain if we could introduce into Perak a number of Chinese rice growers *with their families*, and, though the State does not grudge money voted to relieve the distressed agriculturalists in China it might benefit them as much, and Perak more, if a large sum were devoted to assisting them to settle in a country less liable to flood and famine. There are, however, great difficulties in the way of the emigration of Chinese with their families, and last year these difficulties seem to have greatly increased and even to a noticeable degree interfered with the usual exodus of the Chinese male population, a fact perhaps not altogether surprising considering the extraordinary reluctance of some to let the overflow of British Indian labour find a profitable field in these States; but, failing the immigration of a foreign agricultural people, it is at least encouraging to find that the Malay rural population is giving more attention to agricultural pursuits.

Piculs 235,651, or about 14,000 tons, of tin were exported during the year, an increase of 16,812 piculs over the export of the previous year. The price of tin averaged $34·93 per picul (about £92 per ton), and the large production is extraordinary in the face of the tightness of the local money market and the remarkable falling off in the numbers of Chinese immigrants. The fact is that times being hard the miners worked better and for longer hours.

This is much like the increased export of cinchona from Ceylon in the bad times. The report goes on:—

The Government Geologist (Mr. L. Wray, jun.) undertook a lengthened search for minerals in the neighbourhood of the Piah river, in Upper Perak, where he found numerous traces of gold, and the Magistrate of that district now writes to me that, having dug a pit 12 feet deep in his garden, he began washing with a wooden tray and found gold at every trial.

One hundred and twenty miles of cart-road and 254 miles of bridle-road were maintained, while 41 miles of new cart-road and 13 miles of bridle-road were constructed, and 11 miles of bridle-road converted into cart road. Over 24 miles of unmetalled cart road were metalled, and a large number of bridges constructed and maintained. It is matter of public remark that the cart roads throughout the State, most of them maintained by contract are in excellent order.

The estimated receipts of the Larut railway were exceeded by $12,670, a satisfactory result, in view of the fact that some of the rates were considerably reduced from the first January, 1889, and the year, as regards trade, has not been a particularly prosperous one. The total receipts amounted to $82,670 against $45,558 cost of working expenses, which left a profit of $37,112, equivalent to 8·36 per cent on capital invested.

Details of railway working and extensions are given, and Mr. Hanson, formerly of Ceylon, receives praise for his energy.

The sanitation of the various townships in the State is being improved, everywhere as to drainage and, where possible, in water supply, and the result, as might be expected, is better health. This is specially the case in Larut where, owing to better sanitation, the insidious beri-beri, which some years ago filled the hospitals and headed the list of fatal diseases, is no longer the dread scourge of Chinese miners and occupies a position of comparatively minor importance.

As far as the Government of Perak is concerned, it is difficult to see what more can be done except to find cheap labour, without which no planting enterprise is likely to succeed. The native of the country works little for himself and absolutely refuses to hire himself out as a labourer on any terms that a planter could accept. The mines absorb the attention of the Chinese, who prefer failure there to steady work and steady wages on an estate, and the planter's only chance of a labour force on which he can rely depends on the natives of Southern India. whom he must import into the State on certain conditions for a term of months.

There are many European employers of labour in the Native States who prefer to pay double the wages to an able-bodied free man who knows his work and will do it to whom wages are paid for labour performed, and who can be dismissed at an hour's notice, rather than be saddled with all the trials attendant upon the employment of the State Indian immigrant. Unfortunately planters are differently circumstanced, and it is absolutely necessary for their success that they should always have a large labour force at command to take advantage of the propitious moment for planting, to turn the variations of weather to the best account, or to save a crop from ruin. Under such circumstances the planter cannot afford to pay the same rate of wages that is given in the open market for much harder work, and he is therefore driven to engage his labour for a term of months and to accept all the responsibilties imposed upon him by special legislation. The interest that the State takes in his success or failure is due to the fact that he cultivates the soil, and for that reason it seems to me that he deserves all the assistance that can reasonably be given to him.

A COMING TEA DISTRICT.

"Ex-Planter" writes from Peermaad, Travancore to the *Asian* as follows:—"In your issue of July 18th 'Smoothbore' remarks: 'Ceylon has a great future before her in her tea; and India, Southern India at all events, cannot successfully compete with her.' If this remark refers to the growth of tea, I beg to inform 'Smoothbore' that if he will undertake a journey of some twenty-four hours from Kodaikanal, viz., to Peermaad, in Travancore, he will find himself in a district which far surpasses most in Ceylon and can compete favourably with the best. My own experience of Ceylon is limited to a thirty hours' stay in Colombo. I make the above statement on the authority of Peermaad planters who have visited Ceylon, and of a leading Ceylon planter who has visited Peermaad. A fact, which speaks for itself, is that a Ceylon paper has begun to speak of Travancore as 'a promising off shoot of Ceylon,' or something to that effect! Should 'Smoothbore' wish to see some really good tea I shall be happy to render him every assistance, and if I am still here, to put him up, if he will so far honor me."—*Madras Mail*.

THE TEA-BLENDER BLENCHING.

(A letter from Mr. Verdaunt Greene to his friend Donne Browne in Ceylon.)

London, July 25th, 1890.

Dear B,

There has been such a row in town
As seems very likely quite soon to bring down
Some of the houses at which you frown
As an owner of tea plantations.
For it seems that some of the 'upper crust'
Of the grocer class have got mixed with the dust
Of their blended teas, through an indiscreet trust
In their own sophistications!

And one of their number, presented at Court
Quite lately, has very despairingly sought
To put himself right with the people who 've bought
His teas and encouraged transgressions;
And it 's quite on the cards that your courtier friend,
Unless his mind and his manners shall mend,
Will be affably asked his way to wend
To the coming Quarter Sessions!

From all I can gather, the facts are these :
He has been in the habit of selling teas,
Indian or others, but mostly Chinese,
For several years in the city,
And had feathered his nest, so people say,
It 's a business, you know, where skill comes into play,
And is helped in rather an imbecile way
By the Government, more 's the pity.

For it seems they omitted to note the fact,
When they lately tinkered the Trade Marks Act,
That earlier registered marks would attract
The ignorant public buyer ;
And having forgotten to cancel these
They have left to the dealer in ' blends ' of ' pure teas '
A chance that his natural talents will seize,
Although not a regular liar.

So a man with a label of ancient date
Has no occasion for washing his slate,
But can still remain in his former state
Of sin and still gather his profit ;
And may use, if he wishes, a label of lies
With the words CEYLON TEA printed more than life size,
And with all the seductions of type to disguise
Each word that he ought to take off it !

Let me give you a case, my friend : suppose
I 'm a dealer in teas : I prefer, of course, those
That give the best profit : it 's this that shows
The gifts of a genuine grocer ;
So I start as a specially honest man,
'T 'is the principal part of my plausible plan,
And I hire the best assistance I can
From a deeply-designing engrosser.

In a specious circular I decry
All other grocers to show that I
Have the general welfare under my eye,
Of Purity, Sole Apostle !
And though, like the lark at heaven 's gate
I never can sing, if you 'll only wait,
I am sure I can nobly imitate
The note of a Seven Dials' throstle !

And I rake my head for fanciful names
For the teas I create, for a blender proclaims
Himself above Nature, and modesty shames
When praising his own production ;
And he wildly raves of the strength intense
Of his " Broken Leaf " and " Spring Pickings " : all sense
He will outrage in lust for the purchaser's pence :
Plain truth would mean simply Destruction !

My Registered Trade Mark is to me
As dear as my own morality,
And I 'm bound to sell under it all the tea
That I buy in the course of trade, so
I call myself an ' importer,' the force
Of circumstances compels me : of course
The buyer can't trace the tea to its source,
And what doesn't seem true is made so

By the Registered Trade Mark. True art lends
Herself to a fraud sometimes, but the ends
Of Justice are met in the case of the ' blends'
Made by myself as ' importer,'
For, aided by Art, I soon design
A label and wrapper that you would define
As ' misleading' perhaps, but you see *they are mine* :
To me they are bricks and mortar.

With these a reputation I build
As sound as the tea in the packets I 've filled,
And with trust in myself and in all of our guild,
I start as an honest retailer :
And I issue teas to the public as ' PURE,'
I *hope* they are so, but I cannot be sure,
For I trust to a buyer the stuff to procure
And he may be another black mailer !

My label, of course, I decorate
With a lovely sketch of a tea estate,
For a picture gives to the label weight,
And Art on the label runs riot !
And into the picture we introduce
A harbour, roads, carts and such items of use
In procuring the tea we are thought to produce,
And a name, to keep everyone quiet !

And, although we may stupidly show our Tea
As covered with flowers, which it ought not to be,
Or even in casks send it down to the sea,
The public have no one to guide them :
And if any who fancy themselves to be skilled
Should enquire of their grocer, who 's one of our guild
And of course with a fine fellow-feeling is filled,
For assistance, woe betide them !

The grocer can only point out the mistake
That the paltering purchaser 's prone to make
In supposing he would, for lucre 's sake,
Indulge in dishonest dealing,
And will warmly add that he can't understand
How anyone can, with a Registered Brand,
Suspect any dealer of tricks underhand ;
Why, it 's little short of stealing !

I have wandered away from the point, I fear ;
I was going to explain what has taken place here,
But I hope my digression has made things clear
As regards our commercial morality,
And I hope you won't think we are all of the stamp
Of this rascal retailer, this scandalous scamp
Whose reputation no tailor can vamp
With his vicious and vengeful venality.

He had lived, it appears, by the tricks of the trade
And on ignorant people for years he had preyed
With his gaudy Trade Marks and his labels displayed
Selling trash to the purchaser willing,
Till at last it was found that the hopes he had nursed
Were a little too bright, and the bubble then burst
And he by his customers roundly was cursed,—
You can get a good lot for a shilling !

Now, it seems that some people who somehow appear
To look on Ceylon as their influence-sphere,
Have lately combined as associates here
In a filabustering faction,
And their time and resources they seem to devote
To the utter destruction of all who may doat
On the value a Trade Mark is thought to denote,
And they threaten a legal action

To all who refuse to accept their terms :
Do they think that the grocers are grovelling worms ?
That the soul of the tradesman squeamishly quirms ?
Or, dubious, fears detection ?
He has a name to lose, not they
The mushroom growth of a darkened day,
What can they possibly have to say.
Against *Government Protection ?*

These parties, it seems, had accused the old gent
Of using a label with wrongful intent,
A label on which I believe he had spent
A large sum of money. He pleaded
His label was only intended to please
The eyes of such persons as cared for his teas :
The words and the picture meant nothing : than these
What further plain statements were needed ?

But the Magistrate took a wrong view of the case,
So the grocer opines, and it seems a disgrace
For a grocer, who held such a prominent place,
To be fined for fraudulent dealing ;
But it seems he admitted *in toto* the fraud
Though disclaiming its motive ! and gravely implored
That the *import* of words he might use be ignored,
But the finer had no fine feeling,

And the double-dealer was stabbed to the hilt
By the Magistrate's order : his blood was not spilt
Though the Court had endeavoured to strip him of g(u)ilt,
But it seems he can never recover.
He cries in the streets, and to drown his distress
He plays on the Middleman's Organ ; the Press
Is deaf to his cries and the doctors confess
That a cure they can hardly discover.

The disease is obscure and the case is unique,
And they know not as yet by what means they can seek
To check the sad symptoms; they hope that a week
Of low diet may be beneficial.
The strangest sign, perhaps, in the case
Is this, that he feels no more the disgrace
That years, one would fancy, could hardly efface
After such a sentence judicial,

But he stares at the people with jaundiced eyes
And asks if they would n't express surprise
If he were beguiled by his enemies' lies
To purchase the teas they offer ?
Though these very teas which he now derides
Are the teas upon which himself he prides
He has built up his pile with rapid strides,
This jerry-building scoffer !

The medical men are inclined to think
His mania due to excessive drink
In the form of ' lie' tea, but a grocer should shrink
From drinking his own preparation ;
It is certainly strange that a subtle sense
Of justice survives a long course of pretence
And leads a man charged with a grievous offence
To utter his own damnation.

(Note by Mr. Donne Browne.)

Can nobody save this wandering child
And lead him forth from Honesty's wild
Lest to further disclosure he be beguiled,
This wretched, elderly stripling?
As the Balaclava men applied
To the Poet for help ere the last o' them died
Let him go, if he only can pocket his pride
To Mr. Rudyard Kipling !

FORESTRY IN CEYLON:

REPORT OF THE CONSERVATOR OF FORESTS FOR 1889.

Col. Clarke's report is on this occasion very elaborate, dealing with the many subjects to which attention has been directed so as to conserve the Forest rights of the Crown, without injury to the prescriptive and equitable rights of the people ; to render the existing timber resources of the forests available and to provide supplies for the future wants of the country. Col. Clarke, with the assistance of an experienced Forest officer, whose services have been courteously lent to the colony by the Indian Government, has at length been able to organize the Forestry Establishment on a footing somewhat adequate to the largeness and the importance of the interests at stake. Col. Clarke, as Acting Conservator of Forests, is assisted as Deputy by Mr. F. A. Broun of the Indian Forest Department and commands the services of 8 Assistant Conservators and 5 Foresters, of whom one is specially devoted to the conservancy and provision of fuel; while 3 Probationers are going through a course of instruction in the Forest School at Dehra Dun. There are 8 Forest Rangers and 11 Forest Guards. Col. Clarke's report of the services of the officers during the past year is that

The officers of the Department have with few exceptions worked well. The prospects of the Department have been much improved by making its members eligible for pensions, and it is hoped that the scale of pay, which is quite inadequate to secure good men, will next be put on a proper footing. During the past year the work in every Province was more or less minutely inspected either by myself or by Mr. Broun, the Deputy Conservator. Clerical Staff.—Early in the year it was found necessary to increase the clerical staff at headquarters by carrying out reductions elsewhere. Even now it is as much as the present staff can do to keep pace with the work.

Of course good pay is necessary, as a rule, to secure zealous and efficient service, but regard must be had in this as in other cases to the means available, and as the Department becomes increasingly useful and profitable, its officers may rely on their just claims being recognized. Even more, perhaps, than Surveyors and Public Works Officers are they exposed to danger from malaria in their exploration of the often distant and as regards population, desolate jungles. There is a vast amount of work to be done in the survey and demarcation of the forests. As yet only 102,000 acres have been surveyed at a cost of R50,000, or at the rate of 50 cents per acre. Of the areas surveyed 68,000 acres are in the new Province of Sabaragamuwa which is rich in forest resources, 15,000 acres in the North-Western Province, 11,000 in the Central, 6,500 in the Western and only 500 in Uva. Readers will be surprised to learn that

The area of forests reserved since the coming into operation of the Forest Ordinance (No. 10 of 1885) is very small, the total area, exclusive of the Walapane forest, of which no survey has been made, being only 809 acres.

Besides the forests actually proclaimed, however, 32 have "been taken in hand," and it is added: I would urge that an officer of some revenue and judicial experience be appointed settlement officer, to proceed from one forest to another until all the arrears are worked off. Some of the settlements hitherto made are not worth the paper they are written on. The Assistant Conservator of Forests, Eastern Province, reports that the forests abutting on Batticaloa lake should be reserved at an early date before they disappear. The Assistant Conservator, North-Central Province, reports that as a rule there is no urgency for reserving forests, but that the forests near Ritigala should be taken in hand. The Assistant Conservator, Northern Province, asks that the forests near the sea in the Mullaittivu, Punarin, and Mannar districts and those in Iranamadu should be surveyed as reserved forests as soon as circumstances permit. The Assistant Conservator, Sabaragamuwa, goes exhaustively into the question of reserves, and gives a map showing the position of the reserves he desires to have. The Assistant Conservator, North-Western Province, also gives a list of the most important forests for reservations, and deprecates any forest sales in Weuda Hatpattu. The constitution of reserved forests in the Southern Province is urgently needed.

Recently in discussing the fuel question we adverted to the principles on which existing forests, reserved by the Crown, were dealt with so as to reconcile the supply of present requirements of timber and fuel with conserving and specially providing for the interests and wants of the future. The principles we adverted to are illustrated in a very interesting manner in the following extract:—

WORKING PLANS.—Nanuoya Forests.—No complete working plan was drawn up during the year, but a preliminary plan of operations was made for the forests between Nuwara Eliya and Nanuoya. These forests, as mentioned in my report for 1888, are of paramount importance for the fuel supply of the Railway, and at the same time being of indifferent growth, at high elevation, much exposed to wind, and situated on steep ground, are somewhat difficult of treatment. In altering the growth from ill-growing and stunted indigenous stock to exotics yielding a maximum of timber in the minimum of time, care has to be exercised during the work in protecting the forest against the effect of wind, in minimising the action of rain on the newly planted steep ground, and in preserving the natural beauty of a forest which forms so marked a feature on the road to Nuwara Eliya, our most frequented hill station. To attain these objects it was decided to adopt the following plan:—The forest was blocked out in parallel strips, two chains in breadth, and at right angles to the prevailing winds, broad belts being also left untouched on the windward side. The strips were again divided into rectangles ten chains in length, and the rule followed of leaving a rectangle untouched lengthwise, and two rectangles crosswise between every two exploited rectangles. In the rectangles or "coupes" thus marked out for felling, only such trees as were badly grown, crooked, hollow, suppressed, or of inferior species were taken out, while the finer specimens were spared. Thus the leaf canopy was by no means entirely removed, and between the standards thus left plants of *Eucalyptus globulus* and *Acacia decurrens* were put in at intervals of 6 ft. by 6 ft. By this arrangement of having narrow rectangles of exploited land alternating with untouched bands of forest, and having the rectangle so short that the rush of rain water cannot get up much impetus, while the mixture of exotics with indigenous species is not likely to be inharmonious, the object we have in view will in all probability be attained. It is proposed to work over the whole forest in 25 years. This year only a commencement was made, and the plantations were unfortunately taken up at the wrong moment, with the result that a large number of plants died.

RAILWAY SUPPLY FORESTS.—The first steps were also taken in the year under review for elaborating a methodical treatment of the forests set apart for railway fuel supply in the section Polgahawela-Colombo. These forests stretch on both sides of the line between Mirigama and Polgahawela, and lie within the Western, Sabaragamuwa, and North-Western Provinces. The Deputy Conservator, accompanied by the Superintendent of Fuel Supply, visited the forests about Mirigama and Ambepussa, made a few rough enumeration surveys, and submitted a report proposing to set apart 10,000 acres of forest for the section Polgahawela-Colombo. The report contains a proposal for working the forests on a 25 years rotation, utilising, as far as possible, a system already tried with considerable success in the Western Province, viz., that of giving out indifferent forest to the villagers to cultivate in dry grain and other food crops for three or four years and plant at the same time

useful timber trees. This system has been tried at intervals for years past, as already mentioned, near Mirigama, with good results, the areas so dealt with being now covered with a vigorous growth of yonng jak trees. It is proposed to modify and extend this system wherever the conditions are favourable and the villagers willing, and where it cannot be adopted the forest will be coppiced. Late in the year two surveyors were detached to make surveys of the available Crown forest and waste land in the neighbhourhood of the villages above mentioned, separating the village claims and holdings, with a view to constitnting these forests permanent timber and fuel reserves. By the end of the year they had surveyed an area of 3,850 acres.

It is a matter for regret that so much land has been alienated in the past that our nearest source of supply of fuel by rail for Colombo from Crown forests lies more than thirty miles distant from the city.

Sample Plots.—The Department is at present without reliable data as to the rotation on which our forest should be worked. This is of conrse due to the infancy of the Department, and time alone can supply the information that is wanted. Instructions have been sent to the Assisant Conservators to select here and there sample areas, in which all the trees of more valnable species are to be measured at breast height once a year at the same season, and a record kept in order to ascertain the rate of growth. The data derived from these sample plots will enable us to determine the exploitable age of the trees and consequently the rotations on which the forests should be worked. Up to this the Assistant Conservator of the North-Central Province has alone made any progress in this work. He cut out two blocks of one acre each, the blocks being again sub-divided into two, one half being left untouched, the other half thinned of the useless trees.

Enumeration Surveys.—A memorandum has also been circulated showing the different ways of making enumeration surveys so as to ascertain the value of a standing crop in a forest. None have as yet been made except some rongh ones in the Mirigama forest. These were carried out in order to ascertain the number of cubic yards of firewood obtainable from different classes of forest, inclnding the jak plantations. Those of the jak plantations were also useful in order to determine the probable annual volume increment per acre of this particular kind of timber.

All this is in accordance with the established principles of forestry; and as the local experience of a series of years is collected, a body of information regarding the best timber trees, indigenous and exotic, to cultivate, and the best mode of treating such trees so as to render them most successful in growth and most profitable at maturity, will be available to the general public as well as the officers of the Department and the Government. For the provision of steady and plentiful supplies of fuel, it is obvious that trees which most readily coppice will be preferable, provided the calorific qualities of the timber are good.—Col. Clarke deals at length with the protection and improvement of the forest staff and as an illustration of the value of watchers who do their duty he states :—

For our reserved forests paid watchers are an absolute necessity. The Assistant Conservator, Eastern Province, reports that since the appointment of a watcher for the eastern shore of the Batticaloa lake, a large amount of timber theft has been stopped, and the result has been to compel buyers to come to the depôt for timber which they had previously purchased from the regular timber thieves.

Col. Clarke agrees with the general opinion that the Forest Ordinance requires important amendments. Amongst the rest, provisions ought certainly to be made for securing the punishment of thieves who steal timber from the Government forests although such forests may not have been proclaimed as reserved. Prosecutions, it appears, have sometimes failed for reasons which seem inexplicable :—

In the Eastern Province a bad character received six months' imprisonment for threatening a forest watcher with a knife. A contractor was mulcted in R100 compensation for damaging Crown property by unnecessarily felling trees to get at other ones.

In the Northern Province five men were proved to have felled and been possessed of eighteen logs cut in Crown forest, but they were acquitted, because the wood was not cut from *reserved* forest.

In another case, in which a wealthy Sinhalese proprietor had been helping himself on a large scale to thousands of saplings from Crown forests, for use on an extensive coconut estate in the Chilaw district, his agents and carters being caught red-handed in my presence, the prosecution fell through owing to some legal technicality.

Col. Clarke then proceeds to discuss the very important and difficult question of chena cultivation. On this subject widely divergent opinions have been and no doubt are still held by officers of Government, some leaning exclusively to the side of Crown rights, while others, in their zeal for the cause of the too often half-starved people (largely because they shirk the hard work of culti vating "wet lands" with rice), make no account of the interests of the Crown, which are, however, the interests of the general community. In this as in other cases there must be a happy mean, in which the interests of both parties meet. If the cultivators are expected to provide pasturage for their cattle, sufficient areas of suitable land must be left in connection with villages for the purpose. Exceptions, too, must be made in times of distress, such as protracted drought has now produced in the Eastern Province. On the other hand it is intolerable that well-grown and valuable timber trees, which cannot be replaced in a generation, or more, should be sacrificed for the sake of a few crops of Indian corn, millets and pumpkins. This is how Col. Clarke deals with the question :—

Regulation and Control of Chena Cultivation.—The cultivation of dry grain in their henas or chenas, although one of the most wasteful forms of agriculture and belonging to the rudest condition of society, is a necessity for the people of those districts where rice cannot be cultivated for want of water. So long as this form of cultivation is kept within proper bounds, that is to say, so long as the people cultivate dry grain in the waste lands set apart for that purpose and do not abuse their license by clearing valuable forest, not much harm is done. But unfortunately the headmen have in the past connived at the destruction of valuable high forest by hena cultivators. A case in point may be seen in the report of the Deputy Conservator on the Eastern Province, extracts of which are annexed to this report (Appendix C.) It is qnite true that in the case above quoted the chief headmen was only recently appointed, but this shows the danger of leaving a matter of such importance in the hands of inexperienced men. The Government Agent has now consented to let a forest officer accompany headman inspecting jungle for which hena applications have been sent in. In order to bring this class of cultivation under better control, the period of hena rotation for each district of the Island where paddy cultivation is precarious should be fixed, and a block of hena for each village, calculated on the number of inhabitants in it, should be permanently marked off and assigned to it for cultivation, a margin even being allowed for slight expansion. Owing to the vigilance of the forest staff, cases of illicit hena cultivation were brought up repeatedly in the magistrate's court, but the fines being in some cases nominal, not only were the officers disheartened, but the people were emboldened to repeat their offence where the infraction of the law was so lightly regarded. The Southern Province, especially Giruwa pattu east and Hambantota district, is now a vast sea of hena, owing to the reckless manner in which villagers have been allowed to devastate the country in the past. Even some of the old forest reserves set apart by Government Proclamation in 1865 have been attacked and ruthlessly

destroyed, nothing remaining in some instances of large forest reserves but a clump or two of trees surrounded by miles upon miles of lantana or scrub.

In view of the reckless devastation thus noticed it is certainly time that the wealth which the colony possesses in its remaining forests of standing timber should be duly protected. What follows is very interesting and important in its bearing on timber and fuel supplies in the future:—

NATURAL REPRODUCTION.—On this important subject Mr. Broun confirms the opinion that I ventured to give in my Administration Report for 1887, that natural reproduction is not unfavourable in this Island. Mr. Broun further says that "it has hitherto not been sufficiently studied. It is, nevertheless, one of the most important items of forestry; for, with an abundant reproduction, fellings can be made with the knowledge that the place of the trees felled is at once taken by others, and without the necessity for filling up the gaps by artificial methods. As, however, seedlings of different species do not spring equally readily under the same conditions, it is essential to ascertain what are the conditions most favourable to the natural regeneration of certain species, and how these conditions can be promoted by forest operations."

It appears, for instance, that the swamp mendora (*Vatica Roxburghiana*) seeds abundantly at the time when the floor of the forest is several feet under water. The seeds are thus distributed in a fairly even layer over the surface where the leaf-canopy is complete, but where the fellings have been made with too heavy a hand, and the soil imprudently bared, the local rush of water carries away all seeds and no reproduction takes place.

Satin seedlings, on the other hand, are hardly ever seen in dense forest, but appear in chenas and in well lit localities on dry, sandy soil under the low shelter. Palu, milla and margosa require similar conditions, and in order to encourage reproduction fairly heavy fellings should be made not far from the seed bearers. Halmilla also requires light and a well-drained soil. If the latter is liable to floods all the better for this species. A gap caused by the removal of one or two trees is in favourable localities sufficient to cause numbers of halmilla seedlings to spring up and struggle towards the light. For this reason halmilla is one of our valuable species which reproduces itself most easily without much help from man. Pehimbia reproduces itself very much like halmilla. The forests between Passara and Nakkalla in Uva are full of seedlings of this timber. Na seedlings and saplings abound in some of the dense forests of the Southern Province and in parts of the Pasdun-korale. Ebony reproduces itself fitfully. What circumstances are requisite for its reproduction are not yet known. This tree requires careful study.

Data are much wanted for a great number of important species, and I trust that all Forest officers will study and make a careful record of the most favourable conditions to the natural regeneration of the more valuable timbers.

The Assistant Conservators, Central Province and Eastern Province report that the year was a poor seed year for trees of valuable species, as compared with 1887, which was good; but the Assistant Conservator, Northern Province, says that the reproduction of satin and palu has been satisfactory. The Forester, Nuwara Eliya, brings to notice that natural reproduction in his district is good on slopes not exposed to the south-west monsoon, *e.g.*, Kandapolla and Maturata. Heen nillu is absent, and liyan, sapu, kina, mihiriya, and damba reproduce themselves well.

ARTIFICIAL REPRODUCTION.—It is a popular belief that the Forest Department should occupy itself chiefly in planting trees. Although plantations have certainly to be made where a quick return has to be obtained, or where other means of reproduction are not available, the Forest Department must depend for its continuous supply of timber more on the natural reproduction of the forests assisted by operations properly conducted than on plantations which cost much time and money, and require much supervision. In fact so costly are they that very good reason must be shown for their necessity before they are undertaken.

Up to the present time the areas planted have been small. They are as follows:—

Eastern Province.—Teak chenas.

North-Western Province.—Teak plantation, Puttalam.

Central Province.—(*a*) Blue gum and *Cryptomeria japonica*, Nuwara Eliya; (*b*) Plantation in strip felling, Nanu-oya.

Western Province.—(*a*) Old teak garden, Hanwella. (*b*) Jak chenas, Mirigama.

Province of Uva.—(*a*) Patana plantation, Badulla.

Details of areas, cost, &c., are given in table (Appendix D).

The teak chenas of the Eastern Province were started in 1876, and have been added to at regular intervals up to the present time. The system followed has been to hand over forest land for chena cultivation to Moormen, on condition that after three to five years they should give back the land planted up with teak, for which purpose seed is supplied to them. Such chenas are to be found at Tumpalancholai, Divilana, Palukanawa, and in the Samantarai and Koralai pattus.

Mr. Broun, who has inspected these chenas, reports that they are not generally in a flourishing condition, the trees being flat topped, stunted, and far from vigorous. Some have been injured by fire, others by the bursting of a bund, and one large area has remained bare for want of sufficient seed, while in most cases illuk grass springs up as soon as the land is handed over by the cultivator. The earlier chenas are in better order than the more recent. To obtain these indifferent results, fine stretches of high tumpalai (*Vatica obscura*) forest have been sacrificed. Mr. Broun is of opinion that these chenas should be discontinued unless the cultivator is prepared to be contented with a forest of a class a good deal inferior to that which be has hitherto received, and I fully concur, as tumpalai is likely to turn out a useful timber for public works. In any case, conditions of soil and drainage should be more carefully studied, companion species of quick growth and light foliage introduced with the teak, while the neglect of the conditions imposed upon the cultivator should bar him from any future grant. Every chena cultivator should be required to keep up a small nursery to repair blanks. The tota area of the teak chenas in the Eastern Province is 639 acres, or nearly one square mile, and the total expenditure, so far as can be ascertained R353·53.

The cryptomeria and blue gum plantation at Nuwara Eliya is situated behind the Assistant Agent's house. It was started in 1888, and covers about twelve acres, over which all low jungle had been cleared with the exception of saplings of the more valuable indigenous kinds. The plantation is on the whole successful. A record of the growth should be kept year by year. The plantation in the strip fellings in Nanuoya forest has already been mentioned. The planting, commenced in 1889, has not been very successful, about 50 per cent of failures having been reported. The old teak garden near the resthouse at garden near the resthouse at Hanwella is some three acres in extent. It was originally opened by the Dutch, but about eight or ten years ago all the trees were felled and sold for R1,000, a very small sum compared with their real value. What now remains is coppice growth from the stools, which had not been trimmed for that purpose; and the plantation is now stocked with a crop of coppice poles of seedy appearance, such as might be expected from the age of the parent trees and the bad shape of the stools. The poles will probably never grow into trees of fine dimensions.

The jak chenas at Mirigama have been already mentioned (see paragraph 24) in connection with proposals for fuel reserves. They have been planted in two separate blocks, one on Hatigankanda, forty acres in extent, and seven to ten years old; the other on Ponarrhuakanda, thirty acres in extent, and eight years old. The former block is planted with jak mixed with domba and wild almond; but of the three kinds jak is by far the fastest grower, outrunning completely the others. There are one or two patches of pure domba which do not seem to thrive at all. The average

height of the 10-year old jak trees is about forty feet, and the average girth about eighteen inches, a very good growth considering that no thinnings have been made. Light thinnings could now be made with advantage. The other block at Ponarrhua is also on the whole successful, except towards the top of the ridge, where he soil is inferior. The plantation is in some parts pure jak, in others jak mixed with lunumidella. Wherever the latter appears the jak is suppressed. Lunumidella is therefore not a good tree as a mixture with jak, and should be omitted, especially in a fuel plantation, its quality as a fuel being indifferent. Creepers in this plantation are pulling down the young poles and saplings, and should be cleared at an early date.

The teak plantation at Puttalam is, in Mr. Broun's opinion, the most successful of our teak plantations. It was started in 1880 by Mr. Maggiolini, Forester of the North-Western Province, who, with the help of his baggage coolies, and sometimes of road defaulters and jail prisoners, planted up a small plot of ground with teak 14 ft. by 14 ft. This distance apart proving too great for proper growth, the distance apart of the plant in the plantation made in the following year was reduced to 6 feet by 6 feet. The area was successfully extended in 1883; but the extension made in 1888 had rather a large percentage of failures, owing to the season (November) being too dry for proper germination and survival. Twenty acres more were taken in hand in 1889, at a cost of R1,082. The seeds on this occasion were put in 5 ft. by 5 ft., as even when six feet apart they did not form leaf canopy early enough. Seeds of satin were mixed with the teak, as the latter species seems to thrive better when in mixture.

The total cost of the plantation up to date is R1,573, and the revenue obtained by sale of thinnings in 1886 was R203, leaving a net expenditure up to date of R1,370 for a total area of 37 acres.

To the twenty-seven acres of patana plantation mentioned in paragraph 52 of my last annual report, the Assistant Conservator, Uva, has added another thirteen acres at a cost of R792, or about R56 per acre. The blanks in the older plantation have been filled with grevillea and casuarina, and the newer plantation consists of casuarina, sapu, and ingesaman. The plantation is a very successful one, and reflects credit on the Assistant Conservator.

The total expenditure on the Badulla plantation from the commencement amounts to :—Twenty-seven acres in 1888, R2,195·45, upkeep of do. 1889, R425·78; thirteen acres in 1889, R735·93, in all forty acres—total expenditure, R3,357·16, or nearly R84 per acre, rather a high figure considering the prices at which forest land has been sold in the past. Mr. Moss considers that weeding should be kept up for three years, and, although this is the cause of the great cost of upkeep, it is indispensable on account of the encroaching nature of grass roots.

At Haputale about a quarter of an acre was planted up with iron-bark by the depôt cooly. The Assistant Conservator, Northern Province, again brings to notice the proposal originally made by Mr. A. Clark of making plantations of palmyra on the vast expanse of sand near Jaffna. A large amount of this timber is exported to India annually by private parties, and the supply is now very limited. This wood has a pre-eminence in strength over Moulmein teak, is in great request for building, and white ants will not touch it. The food products of the tree are too well-known to require mention.

IMPROVEMENT FELLINGS AND CREEPER CUTTINGS.—Little systematic work has been done in this respect, but several of the forest officers when making their inspections are accompanied by two or three coolies with catties, and these cut down the creepers met with on and near their routes through the forest. As regards improvement fellings, they are badly wanted, especially in the halmilla forests, where a little light should be given to seedlings, in order to encourage them to grow up. When the dominating tree belongs to a spicies not worth felling, sufficient light can be usually let in at small cost by girdling the trees. This is especially wanted, Mr. Broun reports, in the Verani forest, Eastern Province, between Putuvil and Panawa, which is crowded with halmilla advance growth. A beginning should now be made in most Provinces.

EXPERIMENTS IN EXOTICS.—By desire of Government this Department will undertake before the commencement of the south-west monsoon of 1890, a plantation of Para rubber (*Hevea braziliensis*) from seed supplied by the Royal Botanic Garden, Heneratgoda. The place selected for the plantation is near Nambapana in Sabaragamuwa, where the climate is considered by Dr. Trimen to be suitable, and whence export will be easy.

The Conservator of Forests, Travancore, has been asked to supply this Department with seed from localities in the hills where teak grows most vigorously. The seed having arrived, a site with similar conditions of soil and elevation to that of the Travancore hills will be selected, probably near Kadugannawa.

The Conservator of Forests, School Circle, North-Western Province and Oudh, has also been asked to supply us with small quantities of seeds of some Himalayan conifers, viz., *Cedrus deodora*, *Pinus longifolia*, and *Pinus excelsa*, for trial near Nuwara Eliya, where, if the trees succeed, they will be as ornamental as they are useful.

The Assistant Conservator, Northern Province, reports that a mahogany tree planted in Jaffna in 1852 is now 7 feet in circumference at breast height, and with a clean bole of 16 feet. This means an annual average increment of 2·3 in. in girth, or ·74 in. in diameter, or in other words, the annual concentric rings are on an average ·37 in. thick.

We have extracted at such length because the passage taken over supplies just the kind of information which many planters and others are anxious to obtain. It will be seen that jak is one of the best trees to cultivate on the plains and in the lower hill zones. As regards *Pinus longifolia*, the appearance of a beautiful specimen in the Hakgala Gardens affords strong proof that it will do well at Nuwara Eliya and in its neighbourhood. This tree yields excellent timber. Encouragement ought also to be derived from the fact that a tree of *Cupressus torulosa* about 20 years old, cut down last year by Mr. Nock, gave 176 feet of 1 inch boards, much like white pine in appearance and easy to work. Why *Cedrus deodora*, which is the Indian representative of the cedar of Lebanon, has not been a success in Ceylon we cannot say, but this tree and *Pinus excelsa* would be acquisitions. One of the best and most satisfactory trees which we have borrowed from Australia is *Grevillea robusta*. The *swamp mendora* alluded to is one of the most curious in its growth of our trees. Specimens may be seen at Kalutara, growing out of the water by the side of the Kaluganga, with roots springing up several feet in height, like vast sharp wedges. Satinwood, ebony and the allied "calamander" and ironwood deserve large attention from our Forest Department. There are half-a-dozen young *na* trees near the plot where the band plays in Victoria Park, Colombo, which promise to vie in beauty of foliage with the splendid specimens of iron wood trees on the edge of the Kandy Lake. This and similar trees, some of the red-leaved Eugenias especially, ought to be largely used for the adornment of our towns. We are glad to learn that the blue gum and cryptomeria plantation at Nuwara Eliya is a fair success. Both trees coppice well, we believe: of the blue gum we are certain. The difficulty, indeed, is to stop the growth of the numerous shoots which spring from the stocks of felled blue gum trees. It is well to know that *lunumedilla* which grows very rapidly and supplies a pretty cedar-like timber for ceilings and curiously enough for canoe outriggers, although it is said not to stand exposure to weather, ought not to be grown with jak, if the latter is to get fair play. Satinwood and teak, on the other hand, grow well in association. What is stated of a mahogamy tree at Jaffna is

certainly encouraging with reference to the cultivation of this valuable tree. Meantime experiments at Nuwara Eliya and around it prove that an allied tree, the *red toon*, grows rapidly and beautifully in form and vegetation. In rapidity of perpendicular growth it excels the *cryptomeria* and vies with the Australian Eucalypti and Acacias ("wattles"). The margosa (the *neem* of India) is closely allied to this tree.

We trust the idea of plantations of that most useful timber and food palm, the palmyra, which is rapidly becoming scarce, will be seriously taken up. We shall look with interest for accounts of the result of an experiment which is being tried in the arid Hambantota district. Palu, which combines, like the palmyra, the valuable qualities of food bearer and timber yielder, ought also to receive special attention.

Communications and buildings are dealt with, and Col. Clarke shows a desire to alleviate the hardships to which the forest officers are exposed:—

Foresters' bungalows are much required in the uninhabited portions of the Island, where their work takes them, *e.g.*, in the southern part of the Eastern Province, the Uva Bintenne, and the eastern part of the Southern Province. These I propose to supply by degrees, as it is not fair upon the officers to require them to endure greater hardships than are preventible by a reasonable outlay. A Forester's life is not by any means a bed of roses.

Under the head of "Yield and Working" Col. Clarke notices disadvantages at which the Forest Department is placed in being compelled to hold large stocks of timber to meet the requisitions of the Public Works Department, without the certainty, for want of estimates, of such stocks being indented for. The prices paid, too, were inadequate:—

For instance, the Public Works Department in the Northern Province was supplied with palai at 50 cents per cubic foot, which would have realised R1·12½ if sold to the outside public for export to India.

It might seem to some persons that, the timber being the property of Government, it could not be of much consequence at what price it was accounted for. But any such loose system of accounting would cause confusion and worse. The Public Works Department would obtain undue credit for economy, while the Forest Department would appear to be conducted at a loss great in proportion. It is not surprising, therefore, to learn that a revised scale of prices has been framed. The report of the Committee on sleepers for the railways, which we some time ago reviewed and quoted from at great length, is adverted to. The result of the deliberations of that Committee was that a trial is to be made this year of 200 sleepers of each of 25 species of Ceylon timbers. Our readers may recollect that the two railway members of the Committee suggested that the trial sleepers should be supplied gratuitously by the Forest Department. This proposal Col. Clarke emphatically resisted, on the ground that the good quality of the larger proportion of the timbers was beyond question. Meantime 10,000 doon sleepers (*doon*, not to be confounded with *toon*, being our hardest and best wood) were supplied for the Bentota extension. The details regarding timber supplied to other public departments and to the public generally are so interesting and calculated to be so useful to many of our readers, that we feel justified in making a lengthened quotation:—

Timber of the value of R39,590·63 was sold to the Chief Resident Engineer, Haputale Railway Extension, for the construction of bungalows, &c. Among the other Public Departments the Postal is probably the next largest buyer, for telegraph posts, 503 of which were supplied during the year. Smaller quantities of timber were requisitioned by the Colonial Store for the Harbour Works, by the different Road Committees, by the Military authorities at Trincomalee, and by the Railway Department. The Railway Department applied to us for a timber which, while equally durable as jak, should be somewhat lighter in haulage. We supplied them with "kina," and it is now being tried for the flooring of railway carriages; but as it has been used when green it is hardly receiving a fair trial. It would be worth while to try hulanbik and margosa in lieu of teak for the interior of railway carriages, as teak has gone up considerably in price. Hulanhik has a beautiful satin lustre, while margosa is not only a handsome wood, but insects will not touch it owing to the essential oil it contains.

The timber sold to private parties is usually for export either in the log or converted into casks, boxes, &c. The woods most in demand are ebony, satin, halmilla, palu, hal, and hora.

Ebony and satin will be mentioned later, under Central Depôt.

Hal and hora are much used for tea boxes and plumbago casks, respectively.

The palu and satin sold for export come chiefly from the North-Western Province and Eastern Province. Halmilla is largely bought for India, and has a considerable sale in Ceylon. The Indian Government was supplied with 3,229 cubic feet of picked halmilla at R2·50 per cubic foot, realising R8,062·50. That sold locally comes from private land, frequently from temple land in the North-Western Province, Central Province, and Eastern Province, and some from Crown forests in the same Provinces. The supply from private sources is now becoming limited, and as the oil mills do not offer as good prices as purchasers from India, most of that timber is shipped for that country. A number of native coasting craft, which carry the paddy grown in the Eastern Province to India for clearing and winnowing, load up with timber of this and other kinds, for which they pay remunerative rates.

Central Depot, Colombo.—After considerable correspondence an arrangement was come to between the Engineer of the Harbour Works, the Railway authorities, and the Master Attendant, whereby the Forest Department was permitted the use of the southern half of the Breakwater yard as a timber depôt, and a portion of the root of the Breakwater as an ebony stacking yard. The object of having a separate yard for ebony at the harbour was to avoid expenditure in the movement of it between shore and ship. It now remains on the spot to which it is brought from the interior of the Island until wanted for loading on board ship. As our occupation of the Breakwater yard is conditional, and has to be given up in the event of the Northern arm being constructed, there is an element of uncertainty in our tenure, and we cannot set up permanent sheds and saw mills. As a consequence, the sawing of timber at this depôt was done in an irregular manner, and we had in the long run to ask the Government Factory to saw the timber for us.

No business was done in ebony until the close of the year. The English market was reported continuously throughout the year as flat, large stocks were still unsold in the docks, and there was very little demand either for Europe or China. A small quantity was offered in the Colombo market collected from private land and from temple land, but chiefly of indifferent quality. By the middle of the year some 500 tons of Government ebony had been collected from all parts, and after shaping and trimming was divided into lots to suit the European and China markets. The highest price offered early in the year had been R80 per ton at Trincomalee, but with the approval of Government the ebony was held until the close of the year, when 102 tons were sold for R14,280, or an average of R140 per ton for all classes, bad, good, and indifferent.

Then follow details connected with the difficulties of obtaining supplies of timber from distant parts of the island for the Colombo depôt. The

"Lady Gordon" is often not available, and we regret to find it stated:—

Getting timber by rail from Matale is almost prohibitive, the rates being 33 per cent. more than the steamer rates, and we never use the railway unless we are absolutely driven to it.

We should think this was a case for special rates, and if rates at which timber can be cheaply conveyed from the great north-central and northern forests cannot be arranged for a northern extension, such as is now under consideration, that fact will be "a heavy blow and great discouragement" to the enterprise. As matters stand, the Forest Department is compelled to resort to private sailing vessels for lower rates of transport.—Not only the tea planters with the demand for their tea factories, but all fuel-consuming establishments in Colombo and the general public who have year after year to pay high prices for firewood used for domestic purposes, are interested in the question of fusl supply. We need, therefore, make no apology for another long extract:—

The supply of fuel to the Government Railway remained throughout the year in charge of Mr. W. H. Clark. As a rule there have been no complaints about the quality of the wood supplied, but on one occasion a large amount was rejected by the Railway Department among the deliveries at Veyangoda. Most of it, however, was accepted at reduced rates.

During the year 19,964½ cubic yards was supplied from Crown forests at a cost to Government of R22,666·21, and 58,321¼ cubic yards from private forests at a cost of R79,553, or a total of 78,285¾ cubic yards at a cost of R102,213·53, exclusive of cost of establishment and other expenses. The revenue obtained from this firewood amounted to R118,180·70, which sum covers costs of establishment and sundries, and leaves a margin to expend on the re-afforestation of the Crown forests set apart for the railway supply.

As seen from the above figures, the amount supplied from private forests is about three times as great as that from Crown forests. There is no doubt, however, that the supply available from private sources is diminishing rapidly and the time will come when the bulk of the supply must be drawn from Crown forests. The cause of this is due partly to the denudation of private forests without corresponding re-afforestation, and partly to the indirect results of the establishment of a Forest Department. There is no doubt now that much of the so-called private wood of a few years back really came from Crown forests. For instance, the supplies delivered at Kalutara came almost entirely from the Crown watnranas on the Kaluganga and its affluents, but since these forests have been more closely watched, it has become exceedingly difficult to get tenders for the supply of private wood to be delivered at Kalutara.

It is the intention of Government to increase gradually the proportion of fuel yielded by Crown forests until, if possible, the entire supply comes from that source. Obviously this cannot be done at once, for until we know what amount of Crown forest there is available, risk would be run in over-working our forests on the mere supposition that the supply is sufficient. A survey is now being made of the Crown forests bordering on the railway, commencing near Mirigama, and the surveyors are working gradually eastward.

Later on it will be necessary to make fuel plantations on the upper section of the Railway above Kadugannawa, as it would be too costly to transport firewood up the incline from the lowcountry forests.

The rates per cubic yard at which firewood was supplied to the Railway during 1889 were as follows:—

	Class I.	Class II.	Class III.
	R. c.	R. c.	R. c.
Upper Section	1 65	1 50	1 37½
Lower Section	1 50	1 37½	1 25

It is considered that so long as first class firewood remains below R2 per cubic yard, firewood can compete successfully with coal. This rate, however, takes no account of wear and tear in the boiler tubes, which is far greater with coal than with wood.

The other Public Departments in Colombo supplied with firewood were the Convict Establishment, the Harbour Works, the Government Factory, the Master Attendant, and the Government Printer. The amount sold was R17,844. In Uva R61·70 was realised by the sale of charcoal to the Public Works Department.

FUEL SUPPLY TO THE PUBLIC.—In the towns of Jaffna and Trincomalee, the fuel for the residents is supplied from Crown forests. In Jaffna the wood is brought to depot, and retailed to purchasers. The rate at the beginning of the year was R4 per ton of dry firewood, but this was subsequently raised to R5. The quantity sold amounted to 2,187 1-7th tons, realising R10,103. In Trincomalee a system of licenses was introduced which leaves the establishment free for supervision. During the year R380 was realised on this account, a license fee of R10 being levied on each single bullock cart. Besides the above R66·40 was recovered for royalty on 332 tons, at 20 cents per ton. At Galle the firewood for the town supply comes almost entirely from Crown forests, but the Crown derives no revenue from the removal of firewod.

A wasteful system prevails in the Galle district of allowing the villagers to sell, after the harvest is over, the fence sticks out by them from Crown forests. As fence sticks will last at least three years, if this practice were stopped, as undoubtedly should be the case, a large saving of straight and valuable saplings would be effected.

In Uva 148¾ cubic yards of firewood were sold for R290·60. A royalty of R35·05 was paid for 701 bushels of charcoal, and the Assistant Conservator sold for R196·75, 583 bushels prepared by the Department.

On receipt of a valuable memorandum prepared by Mr. Broun, the Assistant Conservator tried some Indian methods of charcoal burning, and eventually devised an improved kiln, which not only gives as large an outturn, but requires less care in construction and in supervision after firing.

As regards the supply of firewood to tea estates rules have been drawn up and passed during the year, which prescribe the conditions under which estates can lease tracts of Crown forest for the purpose.

The notice of charcoal and improved methods of preparing it suggests the question, which, we suppose, must have been well considered, of the use of this substance in the locomotive furnaces, in which case it would seem that the carriage up the Kadugannawa incline of so light a substance ought not to be costly? Then again if, Indian coal of a fair average quality continues to come in at moderate rates when compared with the cost of the black diamonds from Cardiff the proportion to coal of wood fuel at R2 per cubic yard may cease to apply. Of course the quality of coal as well as its price have to be taken info consideration, and we suppose that coal of an inferior quality for calorific purposes will be damaging to boiler tubes in proportion to the degree of inferiority? Col. Clarke does not touch on petroleum waste, the use of which, if it could be cheaply supplied from the fire regions of the Caspian, or other sources, Indian perhaps included, would considerably affect the demand for firewood by tea planters, as well as by the railway and foundries and factories generally.

The royalty and share systems of dealing with forest produce are noticed, and here, as in India, North Borneo and other places, it is felt that the public have a right to some share in the value of minor products removed from the forests, jungles and patanas, or the grass lands which correspond to the latter. On this subject the report states:—

A great deal remains to be done by the Forest Department in bringing to market the minor produce

of our forests. Only in two or three Provinces has a commencement been made at present. In Uva R3,010 was realised for the right of collecting gall-nuts (*Terminalia chebula*), R17 for the right to quarry limestone, and R81·68 for the sale of mana grass growing on the Crown patanas. Certain planters have thought fit to object to paying for this grass, but considering that some of their members remove from two thousand to five thousand bundles (head-loads) per mensem, and are only asked to pay the very small fee of R2·50 half-yearly, and that they have no right of user whatever, there is no substantial ground for complaint. The Assistant Conservator, Sabaragamuwa, complains that although endeavours have been made to lease the collection of aralu nuts, these efforts had failed because the villagers have been accustomed to help themselves. This is another argument in favour of reserving forests without loss of time, and having the rights and privileges defined. In the Eastern Province the forest produce sold realised R1,252.

As already mentioned the sale of minor forest produce reqnires development. The right to tap inferior trees for resin, gnms, gamboge, &c., might be leased out. The bark of ranawara (*Cassia auriculata*) is largely exported for tanning from the Hambantota district, and there are other trees which yield tanning material, such as the fruit of bnlu and nelli, the leaves of dawa, and the bark of many trees, all of which should bring in revenue. Velan bark (*Acacia leucophlœa*), a large article of export, is freely taken from trees growing on Crown lands, the bark being stripped to the unnecessary damage of the trees. No royalty is of course paid, and the Treasury is a great loser.

In the Northern Province R336·80 was realised from the sale of green leaves from the commoner kinds of trees for manure for tobacco gardens. This is not a kind of practice which deserves much encouragement. The rnthless destrnction of palu trees for their fruit, the natives of the Northern Province boing allowed to break off large branches in order to obtain the fruit more easily, still goes on unchecked in this Province. Mora trees in the Eastern Province and beraliya trees in the Southern Province suffer in the same way. By allowing the people to break off the branches, rain-water penetrates into the holes so formed and rot speedily sets up. Our fine palu trees in the Northern Province are threatened with extinction, if the practice be allowed many years longer. Another pernicious practice is that of felling trees for the sake of getting at honeycomb. As the procedure is quite unnecessary, there is no donbt that it should be stopped.

FREE GRANTS AND REMOVAL UNDER RIGHTS AND PRIVILEGES.—Owing to our principal forests being situated in districts where there is littlle population the forests are not much burdened with rights, and where natives are allowed certain privileges, these must be regarded as concessions rather than as rights. Besides grants of timberfor purposes of public worship, public institutions, and so forth, by far the largest amount of timber really given away consists of permits to cultivate chena. If the amount of timber given away annually in this way were calculated, the figures would be startling.

With reference to mana grass from the patanas, a fee of R2·50 per annum for, we presume, unlimited cutting does not seem unreasonable; and Government, in replying to the Haputale Planters' Association on the subject, seemed to indicate that the object of the exaction was mainly to secure the continued rights of the Crown in the land. Should a factory or factories be established for converting the patana grasses into "strawboard," for the manufacture of tea chests and for other purposes, we can only repeat our bolief that all possible encouragement will be given to an enterprise calculated to utilize produce which now runs almost entirely to waste over hundreds of thousands of acres of our upland prairies.

The gall-nuts produced by *Terminalia chebula*, and the bark of the ranawara (*Cassia auriculata*), the latter a pretty yellow-blossomed shrub, are amongst the most highly valued substances used for tanning hides, an enterprise for which Madras is famous. This *Cassia* must not be confounded with the *Acacias* (popularly mimosas) so common in the jungles of the arid regions of the north and east of the island, the marked characteristics of which are formidable thorns and beautifully colourd flowers of sweet odour. The bark of one of these, *Acacia leucophlœa*, is amongst the minor forest produce which Col. Clarke desires should contribute something to the public revenue as well as to the profit of the persons who in stripping the bark, kill the trees. In this case, but much more in the practice of breaking down the branches of the *palu* tree to secure the edible fruit, the natives exemplify the moral of the fable of the goose and the golden eggs. Stringent rules, especially as regards the *palu* trees, can be defended on the ground of benevolent regard for the interests of the reckless natives themselves.

On the whole the report indicates satisfactory progress:—

The transactions of this Department show a considerable increase in 1889 over those in 1888, the value of timber and other produce sold being R280,199, as against R173,820; while the value of stock in depôt has increased by R83,796, being R244,264, as against R160,468 at the end of 1888.

Details of stocks of timber and firewood in the depôts of the various Provinces are given, and Col. Clarke observes:—

It is satisfactory to note that only in one Province—Uva—is the stock less than in the previous year, due in this case to increased sales involving the emptying of the depôt more quickly than it could be replenished. By adding the valne of the stock in depôt to the value of sales for the two years respectively, it appears that the timber transactions amounted in 1888 to R333,849, and in 1889 to R524,380, thus showing an increase of R190,531. As regards the actual sales, I shall now endeavour to show, so far as the very unsatisfactory returns permit, that there has been increased activity in sales of timber, firewood, cbarcoal, bamboos, and cane, and minor forest produce.

Then follow the details, with the remark that the increase of firewood supplied by private forests is not taken into account, any more than "Drift and waif wood and confiscated forest produce." Col. Clarke then deals with returns of timber imports and exports supplied by the Customs Department:—

Excepting satinwood, it will be seen that the imports consist chiefly of timbers which have equally good representatives in this island. Teak, the chief import, has now risen in price to such an extent that a considerable saving would be effected by substitnting indigenous timbers for it. For ordinary railway construction, balmilla, satin, milla, and palu would all be suitable, while for railway pannelling, halmilla, margosa, hulanhik, paanaka, and many others would answer the purpose of teak. Flowered satin cannot be excelled for pannelling.

Large quantities of teak from Burma, and "white cedar" from Cochin, are imported for oil-cask staves and shooks, but experiments are now being condncted to find cheaper substitntes for such purposes. Halmilla is considered by oil-cask makers as good, if not better than teak. The price offered to the Department by the oil-mill proprietors for halmilla is not, however so high as those obtainable from Indian traders. Timber traders in Burma and elsewhere are constantly sending trial timbers, but np to the present, whether owing to brittleness, porosity, or to colouring mattor, none have been accepted. It is imperative that something should be done to prevent this trade passing ont of the Island, and a circnlar was sent to the Provincial Forest officers inquiring what woods wonld be likely to be snitable, and asking them to send enough timber of the species selected to make half a dozen casks. As yet only doon has been submitted to trial, and a report on its merits is now awaited.

As regards exports, that of ebony has fallen from 12,352 cwt. in 1888 to 3,880 cwt. in 1889, the reason for which has already been explained in paragraph 87. The exports of satinwood have also been reduced probably also owing to an increase in the market price and partly owing to a better watch being kept on Crown forests. The export of halmilla has increased but the figures evidently do not include the logs exported in the rice dhoneys from the Eastern Province. These latter probably come under the heading "Wood of Sorte," which shows an export of 26,779 logs as against 6,909 in 1888. The exports from the Island deserve every encouragement, as they bring money into the Island, and because we have at present more than sufficient for our local works; while imports require to be diminished as much as possible.

We cannot wonder that teak is such a favourite timber. The logs can be obtained of so large a size and free from faults, the timber is so easily worked and from the oil it contains is impermeable to insect attacks and weather influences. But, at the present rate of consumption, the supplies are likely to become scarce. Hence the necessity as well as the propriety of trying experiments with others of the many timbers included in the Ceylon Forest Flora. A portable saw-mill with connected machinery has been applied for, and the formation of an establishment of elephants for dragging timber. The report is altogether so interesting that considerations of space alone prevent our giving it entire. But we must again quote:—

DESTRUCTION OF GAME AND FISH.—There seems to be no doubt that game, once so abundant, is now diminishing greatly, owing to its wholesale destruction by the natives for purposes not of legitimate food, but of trade. The trade is in the hands of Moormen who supply the villagers with gunpowder and shot. The villagers shoot every head of game that comes in their way, usually at night, over waterholes in the dry season. Any one whose duty it is to travel much, especially in remote parts of the Island, will bear me out in saying that seldom a day passes without meeting one or more men with guns in their hands going out shooting, while men carrying pingo loads of hides and horns constitute a regular service. There are also a great many so-called *savants*, usually foreigners, who come here to prosecute their studies and look to pay the expenses of their tours by carrying off quantities of skins of all sorts which they mostly purchase from natives. Last year the village of Mahakekirawa was literally carpeted with drying skins, which one of these persons had by timely notice beforehand induced the natives to shoot and bring in to be purchased by him at market price! When the supply was large, and the buyer a single individual, the market-rate may be easily conjectured —just what he chose to give them.

A great many lives of elephants are recklessly destroyed by elephant catchers, who shoot the mothers in order to get at the calves, or who drive a herd for weeks before they kraal them. The poor beasts are then so exhausted, that in many cases not 10 per cent survive. The killing of elephants in herds should be strictly forbidden and restricted to solitary rogues.

Like the game, fish is disappearing, or has quite disappeared from many rivers owing to the destructive and pernicious habit of driving fish into kraals. As this goes on at all seasons, and as fish of all sizes are taken, the rivers are being drained of their resources.

HERBARIUM OF FOREST TREES.—A herbarium has been started at headquarters. It is hoped that before long it will contain all the commoner kinds of trees of the Island, so as to be of use to forest officers all over the Island wishing to identify trees in their forests.

A small collection of sample Ceylon timber has also been started. This will probably be useful in order to make Heads of Departments and the outside public acquainted with the numerous and excellent Island timbers as yet practically unknown.

GIRDLING OF TREES PREVIOUS TO FELLING.—The great drawback to using palu for sleepers is said to be that in seasoning it cracks badly. The same timber, or one very closely allied to it that is found in the Andamans, when girdled and allowed to stand for year or so after the tree dies before it is felled, seasons well. Eighty-five palu trees have been girdled in the Central Province, and good results are looked for. White ants will not touch palu.

TENTS.—Two light field tents (double ply, 10 ft. by 8 ft., and weighing only 80 lb.) were ordered from the Cawnpore mills, and handed over to the Assistant Conservators of the Northern and Eastern Provinces for trial. Their cost landed in Ceylon was R212·39. Should they prove suitable others might be ordered from the same source, if they cannot be copied in this country.

Details of revenue and expenditure of the department are then given, and in the following paragraph it is shown that it was high time to intervene so as to prevent the annihilation of the celebrated ebony trees of Ceylon:—

That the benefit to the Department amounts to R80,495, or R63,977 more than the preceding year is matter for congratulation, considering that the expenditure has risen from R247,510 in 1888 to R393,962 in 1889 *i.e.*, by R146,452 of which R38,271 is on establishments alone. It has been said in some quarters that in spite of the appointment of a staff of forest officers the revenue as compared with former years has been small, and has been mostly swallowed up by the expenditure on that establishment. The answer to this is evidently that the forests were recklessly worked, as can be seen from the returns of ebony exported, which alone point to an export of over 1,000 tons annually during the years 1880-87, at which rate of cutting there would scarcely remain a tree left by the end of the century.

Col. Clarke states that

There is a great deal of money annually lost to the Crown by not collecting the drift wood in our more important rivers, the Kalu, Kelani, and Mahaweli gangas, but I hope that this important duty will receive early attention.

Finally, we quote the conclusion of this very interesting report:—

There is every prospect that at the close of 1890 the Department will show itself self-maintaining, and in 1891 and onward there will be a growing revenue paid into the Treasury. In fairness to Uva, which does not come out well in the table showing benefit or loss to the Department in the respective Provinces, I should mention that it is really entitled to a large share of the outstandings which are put down to the Central Province, these outstandings being mainly due for timber supplied to the Haputale Railway Extension, which runs quite as much through Uva as through the Central Province. Uva has greater difficulties as regards transport than any other Province, and it is rather hard that it should not be able to show one of the few transactions over which it would make a profit at comparatively small outlay.

Ceylon appears to possess many timber trees which have been hitherto considered of secondary value or have been entirely neglected because their qualities had not been properly tested. Col. Clarke seemed determined that this shall no longer be the case; and the zeal with which he has thrown his energies into the task of developing our forest resources is worthy of all praise and justifies the choice of this officer as organizer of a department which promises to be very important and useful.

CHARCOAL OR NO CHARCOAL FOR ORCHIDS.—An interesting discussion is going on in the *Journal des Orchidées* as to the value of wood charcoal in potting Orchids. Count de Moran is an advocate for frequent repotting, and does not lay much stress on the employment of charcoal in the compost. He says very truly that the charcoal of itself contributes no food to the plant, but it certainly aërates the soil, and it is of advantage from its property of retaining gaseous ammonia to the profit of the plant.—*Gardeners' Chronicle*

COCONUT CULTIVATION.

CASTOR V. COCONUT CAKE.

A Native gentleman largely interested in coconuts, and who I believe now intends to cultivate his broad acres, recently asked me what I thought was preferable for coconuts—castor or coconut cake. An acknowledged authority on coconut cultivation told him the latter. My opinion, pitted against such an authority, will not go for much: but the analyses of Hughes and other chemists shew that the former is far and away the best cake we have for manurial purposes. Hughes' praise of good white caster cake is unstinted. In the analyses of manurial substances he instituted at the instance of the Planters' Association in 1878, castor cake occupies first place among oil cakes. He says, "Taking white castor cake as represented by analysis for our standard of comparison, and taking 100 as the equivalent of such standard, we have the following comparative relation between the cakes." In the table that follows, white castor is represented by 100 and occupies 1st place, and coconut poonac is represented by 53 and occupies a place only above Domba cake, and comes after China bean, rape, gingelly and other cakes. There are more recent analyses by Hughes, and more recent expressions of his opinion of the high value of it as a manurial agent; but I think the opinion I have quoted ought to satisfy anyone that, for matters of comparison manurially, the two cakes cannot be spoken of in the same breath, more especially as at the present moment their price is nearly the same, while a short time back coconut cake was about half the price of castor cake.

On the subject of frequent disturbance of roots I will not now enter, as I have expressed my opinion fully on the subject elsewhere in a controversy with a very old Planter. All I would say is that to me it seems opposed to reason to place food for a tree to feed on, and when it is being consumed and the requirements of the tree are increased, in consequenc , to lessen the "mouths" of that tree. I was told recently that my opinion is opposed to experience, because when a tree showed signs of distress by the yellowing of its fronds, the remedy suggested was to cut the roots, and that this treatment invariably proved successful. I pointed out in reply that the yellowing of the fronds may have been due to want of drainage in the soil, and that the improvement in the condition of the tree that followed the turning up of the soil was due to its aeration, and not to the roots of the trees having been cut.

The appearance of sickly tees in a plantation at uncertain intervals and surounded by healthy trees is an eyesore. The cause for this is so far a conjecture, for no one can say to a certainty what the resulting plants are from the seed he put down. While in European agriculture the selection of seed is considered as of paramount importance, and this mind you in the cultivation of cereals where the results of carelessness need not extent to beyond one crop, here in the cultivation of a perennial like the coconut, where a property is inherited by two or three generation in succession, the selection of seed is not considered to be of primary importance. Those who do not believe that an unhealthy tree is the result of an unhealthy seed, point triumphantly to the laws of heredity being often set aside by a weakly or stupid father having a strong or clever child. They will not allow that these are the exceptions that go to prove the rule. Besides, a child is the offspring of *two* parents, and very often if it does not inherit the characteristics of either of them, it does those of a member of the family to which they belong even to a few generations back. This is noticeable even in coconuts. All the varieties we have must have resulted from one original stock, as in the case of mankind. In planting coconuts we are not certain that the plants we raise from any particular seed will be true to type. I have on this Estate many trees raised from king coconuts. They bear the red skinned coconut which must have been the immediate progenitor in the first instance of the variety now known as the king coconut. This "harking back" is noticeable likewise amongst lower animals. We have frequently one of a litter of pups of quite a distinct breed to the parents, and when there is no uncertainty as to the sire. Very often the breed to which this pup belongs is not to be found in the neighbourhood. So in horses. There is one driven by a well-known gentleman in Colombo, known as well by his name as by that of the "Ceylon bell-ringer" in which he glories, that had for its sire a small-sized Tat pony, owned by a road overseer, and for its dam an equally small-sized Acheen. The filly resembles an Australian for all the world, and ought to secure first place for a long while amongst country bred ponies. All this, it may be urged, by no means proves that unhealthy trees result from unhealthy seed. It is not intended to.—Local "Examiner."

COTTON SEED AND HULLS.

Gradually the prejudice against the use of cotton seed and hulls as a food for stock and hogs is being overcome, and their value is being appreciated. During the past winter hundreds of heads of cattle were wintered on the hulls alone, which they eat as readily as hay, and with no evil results. Used with cotton-seed meal, in the proportion of one pound of meal to four pounds of hulls, they have been found at the North Carolina Experiment Station to form a profitable feeding ration for steers. We take the following details from a press bulletin issued by Dr. Battle:

"Four steers fed at the N. C. Experiment Station for 84 days, each ate on an average during this time 1,517 lb. hulls and 383 lb. meal, or an average per day of 18 lb. of hulls and 4½ lb. of meal, which is almost exactly in proportion of 1 lb. meal to 4 of hulls. The average gain for each steer was 148lb., and the total cost for food was $6.85 each. The gain in weight and the increased value of the beef over the original cost gave an average profit on the above steers of $9.38 per head in cash. The value of the manure in addition will doubtless pay for all the trouble.',

The roasting of the seed is advised by those who have used them for feeding hogs, and several machines have been introduced for the purpose. The one most commended is like a coffee-roasting mill, but made of fine wire gauze. Into this the seed is placed, and turned slowly over a fire until the lint is destroyed and the seed roasted so that it readily grinds in a mill. Hogs have been fed solely on these roasted seeds, and have made splendid fat animals, with a first-rate quality of meat. With all the facilities afforded by the abundance of cotton seed and hulls, why should the South buy either beef or bacon from the West? It can be produced here cheaper than there, and the freight be entirely saved. It seems almost as though Mr. Atkinson's prediction was yet to come true, that the lint would come to be the least valuable part of the cotton crop.—*Southern Planter.*

"KEW BULLETIN."—The current number contains articles on the cultivation of Anotta in West Africa, and on the preservation of grain from Weevils, for which the employment of bisulphide of carbon, 1½lb. to the ton, is recommended. A ball of tow is tied on the end of a stick long enough to be plunged to the middle of the vessel holding the grain. The tow is soaked in the liquid bisulphide, and immediately thrust into the vessel. Naphthaline in powder is recommended for the same purpose, applied by means of a tube or funnel. The naphthaline evaporates, kills the insects, and in no wise injures the grain. Colombian Indiarubber comes also under notice. This is said to be the produce of one of the many varieties of Sapium biglandulosum. The tree grows at higher elevations than most of its race, and is in consequence adapted for a cooler climate. The cultivation of Agave rigida in Bahamas is the subject of another note. The fibre is known as Sisal, and the progress of the culture in the Bahamas is described as something marvellous. —*Gardeners' Chronicle.*

CACAO IN TRINIDAD.—Mr. de Lemos has, while away, according to a contemporary, "travelled about a good deal, going, as far west as South America to see a brother who provided him with abundance of sport. He also visited Trinidad and speaks in terms in high praise of the magnificence of the cacao walks there, where cacao trees 100 years old, still bearing heavily and untouched by any disease, are to be seen! Mr. de Lemos also visited the sugar factories in that island and was greatly pleased and interested with all he saw."

MR. HARRINGTON'S INCINERATOR.—Mr. Harrington writes that during the ten days ending 30th June, 19,000 cubic feet (equivalent to 475 tons of refuse was burnt in his incinerator and that the consumption of coal during the ten days was 59 maunds—a trifle over 2 tons. During the three months of July, August and September, the incinerator is to be under official trial; and. to conform to the contract specification, it must burn not less than 2,880 cubic feet (equivalent to 72 tons) of refuse daily. Mr. Harrington writes that he intends to conform to his specification, and that he hopes not to use any coal whatever. The incinerator is now in full operation.—*Indian Engineer*, July, 5th.

TEA AND COFFEE CULTIVATION IN NATIVE STATES.—During the year 1889, there were 27 coffee plantations in the Native State of Travancore and 18 in that of Cochin. The area of the former was 3,917 acres and of the latter 8,452 acres. The approximate yield in Travancore, exclusive of six plantations with an area of 332 acres in Manachel for which particulars have not been furnished, was 376,148 lb. That in Cochin was 533,828 lb. The average yield per acre of mature plants was highest in the Shencotta Taluq (571) of Travancore and the lowest (152) in the Chenganacherry Taluk of the same State. The cost of cultivation per acre ranged between R50 and R100. The coffee cultivated in Shencotta was of the Liberian variety. As regards tea there were 57 plantations in Travancore and two in Cochin, all under black tea, with an average of 16,597 in the former, and 35½ in the latter State. The approximate yield in Travancore, excluding seven plantations measuring 300 acres, was 571,756 lb. and in Cochin 2,048 lb. The highest yield was in Pathanapuram in Travancore, where 788 lb. per acre was obtained, and the lowest 64 lb. per acre in Cochin. The cost of cultivation per acre ranged from R26 to R80, and that of manufacturing tea between 1½ and 6½ annas per lb.—*Madras Times*, July 19th.

FASTIDIOUS COLONISERS.—Chinamen are, says a contemporary, as tenacious as they seem to be capricious in their preference for certain towns. They are strongly attached to San Francisco, and in a less degree to Rangoon and Calcutta. On the other hand, they avoid Madras and every other point on the east coast of India, and are not to be induced to take up their abode in the Nicobars Islands, a fact which Government discovered as the result of a recent experiment. A scheme was formed three or four years ago for converting these useless islands into a thriving Chinese colony, and fifteen Celestials were bribed to leave Penang for one year and start the new settlement. They went, but refused to work, none of their kith flocked after them; and when the year was up, twelve of the fifteen returned immediately to Penang. The other three made a good sum of money by gardening, but at the end of the second year they too packed up their belongings and departed, for reasons which they kept to themselves. Thus the colonising experiment, which cost R3,000, ended in smoke.—*Pioneer*, July 24th. [The capricious preferences of the Celestials are extraordinary. While Batavia, Singapore and Penang swarm with wearers of the pigtail, the sight of one in Colombo is a rare event.—ED. *T. A.*]

SEA-AIR, according to M. Pierre Lesage, has the effect of thickening the leaves of plants and trees. Moreover, plants grown in salted soil produce thicker leaves. There is a notable increase in the number and size of the "palisade cells" in maritime vegetation as compared with that grown inland.—*Globe.*

PLANTING NOTES FROM PEERMAAD.—"Never within the memory of the oldest inhabitant," has there been, at this season of the year, such extraordinarily fine weather as that which we are experiencing; in fact, it is difficult to realize that we are now well into the middle of what we are in the habit of calling the monsoon, but which this year, so far as rain is concerned, bids fair to be conspicuous by its absence. The monsoon, for I suppose we must admit that it *has* broken, came in so gently last month, that it is almost impossible to fix the exact date of its advent, and after giving us a few fairly wet days, though with constant breaks of unusually fine weather, has apparently left us! For the past 4 or 5 days, not a drop of rain has fallen, and instead of the howling winds, thick mists and heavy downpours which are customary during June, July and August, we are having the most lovely and almost cloudless days, cool and pleasant weeks and the most perfect moonlight nights. Whether this total change in the usual order of meteorological arrangements is to be attributed to the unusually wet weather we experienced during what we call our "hot weather" in March, April or May, or to the eclipse, I am not prepared to say. Coffee prospects are, I regret to say, not particularly cheering. In the early part of February we were favoured with fine blossom showers, and great hopes were entertained of a more than average crop, but the high winds and fearful storms that followed, soon dashed them to the ground, and the coming crop will, I fear, turn out lamentably short. As, however, planters up here have, with a few exceptions, gone in heavily for tea, some of the old coffee estates having been entirely, and most of them partially, transformed into flourishing tea gardens, the effects of a short coffee crop will not be so disastrous as it otherwise would have been. Of the 5,000 acres under cultivation in the district, considerably more than half is under tea and it is satisfactory to note that, with the increasing yield of leaf and improved manufacture, and the introduction on some of the largest properties of the latest steam machinery, good prices are being maintained both in London and New York to which latter port some of the largest shipments are made. In the last "Wynaad Notes," reference is made to the visit of a Government Specialist in connection with the disease that has so seriously affected the cinchona —and Mr. Hooper's* interesting report has lately been published. About 20 years ago a large proportion of the cinchona planted in the Government Gardens up here, suffered in a precisely similar manner to that described by your Wynaad correspondents and at the suggestion of the British Resident, the services of the late Mr. W. G. McIvor were placed at the disposal of the Travancore Government. Mr. McIvor came and saw and reported. He was of opinion that both the climate and soil of Peermaad were unsuitable to the profitable cultivation of cinchona, and, if I remember rightly, advised the Travancore Government to abandon the experiment. In the face of such an unfavorable report, it was only natural that private individuals hesitated to embark capital in the enterprise, and no one thought anything more about cinchona until about 10 years ago when there was a great rush and thousands of plants were put in all over the district and are now doing well enough, no symptoms of canker having appeared amongst any of the trees planted on private properties. Last season's cardamon crop was very short, but the deficit is expected to be more than made up by the coming crop which, I hear, is to be a bumper. This valuable spice is a monopoly in Travancore, the cultivator only receiving 2-5ths of the market value of the crop.—*Madras Times*, July 10th.

* It was Mr. Lawson, the Government Botanist, not the Analyst who reported on the cinchonas.—ED *T. A.*

Enemies of the Cotton Plant.—The Hon. W. W. Mitchell writes:—"I enclose papers I have received from the U. S. Consul showing that arsenite of ammonia is a remedy for attacks of enemies to the cotton plant, and if you can publish it for general information, it might be a great boon. We shall give the full details in the *Tropical Agriculturist*. Meantime, can the remedy be bought locally at a cheap rate?

The plant, known as the "Planters' curse" in Coorg, is spreading fast in Bangalore, and has taken possession of all waste places. The fruits are like currants in appearance and are greedily eaten by birds which convey the seeds all over the place. When well trimmed, the Lantana makes neat hedges, the flowers being of every possible hue and looking quite gay. Just now, the Conservancy Department is engaged in a crusade against this shrub; and it is being cut down and burnt on every side.—*Indian Agriculturist*, Aug. 2nd.

Artificial Coffee is now manufactured to an alarming extent, the spurious article consisting of the roasted meal of different cereals, worked up with dextrin. Two factories exist at Cologne which undertake to furnish the requisite machinery and plant, with directions for making the false coffee beans, for £180. The apparatus supplied by these wholesale swindlers is capable of turning out more than half a ton daily, at a cost of about £1 per cwt. good coffee beans being nearly five times this value in the market. The fictitious coffee is difficult of detection by ordinary examination, especially when a proportion of genuine coffee has been mixed with the artificial.—*Madras Mail*, Aug. 15th.

Mysore Coffee Planter's Grievances.—The agitation of the coffee planters in Mysore is at last likely to bear fruit. It will be remembered that the planters complained year after year that the working of the Breach of Contract Act was very defective and involved them in much loss. The Mysore Durbar have now partially redressed this long-standing grievance. It has been laid down that all *maestries* who take advances from the coffee planters and, in consideration of these, undertake to provide them with *coolies*, should register their names in the taluq cutchery and no one will be allowed to pursue the trade of a *maestrie* unless so registered. The effect of this ruling will be that the planters will be saved from the trouble of instituting inquiries in each case as to the antecedents of *maestries* who volunteered to provide coolies, and erring *maestries* can also be easily called to account in case of default.—*Cor., Madras Times*, July 3.

Planting in Eastern Africa.—An upcountry correspondent criticizing the article from the London *Times* in the *Household Register* on "The Geography of the Anglo-German Agreement," says in reference to the country described as fit for rich tea plantations, "How silly not to state what the latitude of Uganda and Unyora is: if you can, let your readers have it." The country referred as 5,000 to 6,000 feet elevation decreasing towards the north is all within 10 degrees north of the Equator. The line of Equator passes through the Victoria Nyanza, a good deal north of the German territory which may be said to run from 1 degree to 11 degrees South Latitude where it borders with the Portuguese territory and on the south-west with the British again. On the coast and up to the Victoria Nyanza, the British Northern territory runs down to 4 degrees south of the Equator, but the fine country spoken of around and north of the lake, begins at the Equator and runs northward for five and ten degrees of latitude. Coffee and tea plantations will no doubt be opened, but slowly, and labour and transport will handicap pioneering work for a good many years to come.

Cassia Lignea in the United States.—In a review of the spice trade in the American *Drug Reporter* of 17th June we find it stated that

Cinnamon compares well with last year, but the current rates remain extremely low, and chips exhibits no changes of importance. Cassia lignea is exceedingly cheap at 21s 6d to 22s per cwt. for good quality, and, notwithstanding a great falling off in the importations, the stock retains a comparative excess of 47,000 pgks.

Cassia lignea at $2\frac{1}{4}$d per lb. must be a formidable competitor with even cinnamon chips.

"Tea" in France.—"Claudius Clear" writes to the *British Weekly*:—Speaking of French conservatism, it is still rash, save in a very few places, to order tea. The traveller should provide himself with the necessary facilities—it is a simple process enough. The French, it seems, use tea as a medicine, and cherish the sound belief that all medicines should be nasty. I am inclined to doubt, however, whether they actually prepare it from the following recipé. Pour two quarts of tepid water on half a handful of chopped hay, add a soupçon of tallow, and one black currant.

The Tea Enterprise in Mauritius.—The following extract from the proceedings of the "Council of Government" shows that the Mauritians although on tea culture bent, have frugal minds as to expenditure:—

Employment of a Tea Curer for Experimental Farm.—The Committee recommend that, as suggested by the Experimental Plantation Committee, Mr. Oorson be employed till the end of the year on a salary of R100 per mensem with a lodging allowance of R25 per mensem, provided that the appliances now in the possession of the Experimental Farm Committee permit of his services being at once utilized, so as to thoroughly carry out the experiment which it is proposed to make. Should, however, it be necessary to obtain machinery and erect buildings for the purpose, the Committee are of opinion that the expenditure above referred to should not be incurred until an estimate of the probable cost of such machinery and buildings has been submitted for the consideration of the Council.—Adopted.—*M. and P. Gazette*.

The "Unfounded" Charge of Ceylon Teas Not Keeping is thus disposed of in the London letter of the *Indian Planters' Gazette*:—

It is a curious and significant feature of a good market, that when Ceylons are up, one never hears a word as to Ceylon Teas not keeping. On the other hand, directly the market goes down, the old complaint is heard once more. Chaffing a friendly broker about this the other day, he frankly admitted that the complaint is unfounded, and that it was merely an echo of the disappointment felt by holders of fallen Teas. He illustrated this by saying, that, on opening Pekoes bought for 9d last January, now worth 11d, the purchasers can hardly believe their eyes. "Those Teas bought for 9d impossible! What a magnificent show of tip, &c., &c., &c.," and beauties are discovered in those Teas today, now worth 11d, which quite escaped notice when it was a question whether 9d was not rather too dear a price to have paid for them. The January eye was that of the *purchaser* on a *poor* market, the July eye is that of the *seller* on a *good* market—that makes all the difference; Beauty being in the eye of the beholder. Had the case been reversed, and had those Teas cost 11d and been now worth 9d, the Beauty would have been masked, and the keeping quality of Ceylon Teas would have again been in question. It is only human nature to bestow the blame of one's *faux pas* upon somebody or something else than one's self—if a scapegoat is conveniently handy. So much for the outcry against the tendency to "go off" in Ceylon Teas—we used to hear a good deal to the same effect about Indians once upon a time, when teas were tumbling by 4d and 6d per lb. If the complaint has no more substantial foundation than this, it is safe to suppose that it will be lived down—as Chinas die out more and more.

This confirms the opinion we have always held that "the buyer says it is naught."

TEA-DRINKING sometimes causes indigestion, which, it is said, may be obviated by tying the tea in a cambric handkerchief, before placing it in the pot. The handkerchief absorbs the steam.—*Madras Times.*

THE Belgian Legation at Mexico has reported to the Belgian Government on the guimbobo or angu, a textile plant found in the State of Vera Cruz. The fibre is of a very superior quality, while the plant is easily cultivated, and yields a nutritious fruit. Unlike ramie, cotton, or hemp, the fibre is within the bark, which can be removed by a simple machine. Its lustre is like that of silk, it is strong and fine, and of a creamy white colour.—*Globe.*

A munificent sum of from three to five million dollars has been left by Mr. H. Shaw to endow the Botanic Garden and School of Botany in St. Louis, Missouri, U. S. The trustees propose to improve the gardens, house and the herbarium of Dr. Engelmann in a fire-proof building, establish a botanical museum, and further botanical research. To aid in the latter purpose, travelling scholarships have been established.—*Globe.*

A wonderful revolution in flour-barrel-making is promised by a patent which has been granted for the making of barrels out of cotton-duck instead of wood. The new material is impervious to water and resists fire for a long time. It weighs to the barrel about fifteen pounds less than the wood and can be manufactured 10 per cent. cheaper. The cotton-duck barrel can be rolled up into small space and returned to the mills for frequent use. The flour merchants of Atlanta, Ga, pronounce it a success.—*American Grocer.*

A German engineer, Busse, of Linden, Hanover, was granted a patent some time ago for what he terms caoutchouc pavement. Within the past year it has been used for a bridge roadway at Hanover, with good results, and is now being laid down in one of the streets for a length of nearly a mile. Experiments are being made with it also in several streets of Berlin and Hamburg. According to the *Wochenschrift des österr. Ingenieur und Architekten-Vereines,* the new pavement gives rise to no noise from passing vehicles, and at the same time appears to be as hard as stone and is not affected by either heat or cold.—*Engineering Record.*

"TIMBERS, AND HOW TO KNOW THEM."—Dr. William Somerville, the newly-appointed lecturer on Forestry in the University of Edinburgh, has translated from the German the third edition of Dr. Hartig's work under the above title. It forms a small treatise of some eighty pages, with numerous illustrations. It is needless to say the book is good of its kind, and likely to be useful to beginners, especially if used as a guide-book and aid to the study of the woods themselves; but it is to be hoped that Dr. Somerville may be induced to extend it in a future edition by an introductory chapter relating to the formation and growth of wood in general, and the circumstances which favour or hinder those processes. Much might advantageously be added to the details relating to particular kinds of timber, such as the rate of growth under different conditions, the capacity for resistance, the specific gravity, &c. Dr. Hartig has a well-earned reputation as a botanist, but he hardly acted up to it when he suffered such a statement as this to pass:—"The 'Rose-wood' of commerce is got from various, especially Asiatic, species of trees!" Fig. 16, on p. 52, is said to refer to Platanus occidentalis, and it may be rightly, but we should have liked some assurance that the tree intended is not P. orientalis, which seems, on the whole more probable. The statement that the wood of the Austrian Pine (P. Laricio var. austriaca) cannot be distinguished from resinous wood of the Scots Pine is one that, had it been made by anyone else but Professor Hartig, we should have ventured to question. At any rate, the timber of the true Corsican P. Laricio seems different from that of the Scots Pine. Dr. Hartig's is a good book for beginners, but we have more than one English botanist who could have produced a more satisfactory one.—*Gardeners' Chronicle.*

MR. OSWALD has a paper in the *National Review* on Anti-Poverty Receipts, in which he argues in favour of substituting nuts for wheat as the diet of mankind. The Corsican chestnut will provide more food on waste land than anything else that can be grown by man.

TROPICAL PRODUCTS IN QUEENSLAND, NATAL, &c.—With reference to the inquiries of your correspondent "N. Z.," I know of several planters who, nearly ruined through the coffee-leaf disease, emigrated from Ceylon to Queensland in the hope of retrieving their fortunes, but they found the labour supply too deficient and expensive for practical purposes, although coffee appeared to thrive fairly well. I also know a gentleman, an experienced tea planter from Assam, and son of a well-known clergyman in Aberdeen, who started tea culture in Natal, but gave it up as he found it did not pay; he told me the rainfall seldom exceeded 40 inches per annum. In the best Indian tea districts the rainfall varies from 120 to over 300 inches per annum. Apart from the labour question, your correspondents would find New Zealand too cool for the profitable culture of the products he mentions. The labour question is a very serious one, as he would have to compete with the Ceylon and Indian coolies, who barely earn sixpence per day. Cinchona has had its day for the present, and there are thousands of acres of mature trees in South India waiting to be cut whenever the market shows a favourable opportunity, which is not likely at present with sulphate of quinine at 1s 6d and 2s per ounce. The *Tropical Agriculturist,* published in Ceylon, is by far the most reliable work on all matters connected with tropical planting. I have seen it advertised in your columns occasionally, notably on the back of the current year's Almanac. If "N. Z." is a novice in tropical planting, as he appears to be, I shall be happy to forward him full details on tea, coffee, and cinchona planting. *S. S.* —*Gardener's Chronicle,* Aug. 9th.

PLANTS FOR OVERCOMING DRIFTING SAND.—A correspondent, whose letter we inserted yesterday, writing on "Tree planting in Ganjam" stated that an excellent work in the matter of planting was being carried out by the Local Fund Board of Ganjam under the supervision of the Overseer of Chicacole. "Upwards of fifty acres of casuarina have been planted on the drifting sands of the Vamsadhara near Maripam. The wind has forced the sand into dunes, and it is constantly invading the high road, in fact near the river the road is completely obliterated. The planting has been carefully done; each individual plant is manured and those on the steep sides of the dunes are turfed round. . . . If the plantation succeed they will amply serve their purpose and not only protect the road but the fields behind them and the canal distributories." Another way of overcoming the effects of drifting sand would be by planting lupins, which have been proved most effective for the purpose. In Australia drift-sand is often very destructive to farms and pastures near the borders of rivers, and many thousands of acres have been rendered useless by the driving showers of grit which assail and cut all kinds of vegetation. Mr. Bundey, of East Wellington, writing to the Commissioner of Crown Lands last October, said that he had sown lupins with this view for fourteen years, and in no case had he to sow the land a second time. He had reclaimed 100 acres of the worst sand drive on the river by sowing lupins—the only plant that will stand the fearful cutting of the drift-sand. When grass begins to grow between the plants he lets the seeds fall naturally upon the land, and the result is that after the second year sheep can be put upon the pastures.—*Madras Mail,* Aug. 15th.

SUGGESTIONS AFFECTING THE PRESERVATION OF TIMBER POSTS FOR TELEGRAPH WIRES AND OTHER PURPOSES.

A correspondent writes us that it has only been within the last few years that he has observed means to be taken for roofing in, so to speak, the tops of telegraph posts; but that he noticed recently that it is now the practice at home always in some way or other to neutralize the effect of sun and rain upon such exposed transverse surfaces. According to our own recollection of the telegraph posts which carry the wires of electric communication along the less-frequented routes in this island, protection having such an object has always been ignored. The presumption possibly may be that, having regard to the relative rapidity with which the portions of such posts inserted in the ground decay, this matter of sheltering their tops is of comparatively little consequence. As to the justness of such a presumption, we cannot pretend to decide; but as we know that efforts have been made—and with a great degree of success—to lengthen the duration of life of our telegraph posts in-so-far as that is dependent upon the preservation of the part below ground, it might not be unworth the while of the officers of our Telegraph Department to consider some method of protection to their tops.

Whether, however, that department may be content to ignore this suggestion or not, it is certainly the fact that the question of timber protection may be usefully considered by our planters and all other users of timber. For, given a soil which in a greater or lesser degree preserves timber placed in it—and many such soils there are known to be—the life of timber posts exposed to weather might be greatly prolonged beyond what is now normal to them. We can recall very many instances of employment in which our suggestions might prove to be of exceeding use. The top of a post of course lays bare both to moisture and excessive sun heat (both conditions tending largely to hasten decay) the constricted vessels formerly containing sap which have been exposed by the transverse cut. It is well known to engineers and architects that the more the natural taper that is preserved to a pole, the longer will it remain sound. We have seen endeavours made to imitate this natural taper by cutting an artificial point. This is of course an absurd method; for it necessarily lays bare a larger area of cross cut vessels than would a merely flat top, and such cuttings expose further a large conical section of the vessels to which we have referred as being formerly sap-holders, while the area offered to perpendicular rainfall is precisely the same as if a flat top surface had been left.

There have been various methods adopted at home for protecting from the effects of weather the tops of posts. In the instance of square posts, two small boards mitred and nailed together will afford a sufficient roofing, and these are to be observed constantly fitted in the case of dressed signal posts. But for round posts, such as are the majority of those used for the support of telegraph wires, these miniature roofs will not do, and on most cross country lines in England a metal cap with a finial is fitted. We shall, however, have fulfilled our present object if we direct the attention of those who may use timber posts for fences or other purposes to the importance of giving protection to the tops of such timbers. Thought for the portion below ground only is not economical.

In very many cases posts are found to be decaying downwards, while below ground they are as sound as when first put in. Indeed, as we have said, many soils are known—and clay among these very prominently—to have a directly preservative effect upon timber, and in such cases it may be regarded as almost certain that a post will become useless from downward decay long before it has to be drawn owing to that due to the soil it has been placed in. It certainly is not a common thing to see any precaution of the nature we would recommend adopted here, and we believe many among our readers might profitably give heed to our suggestion.

THE ANTISEPTIC QUALITIES OF COFFEE.

It has for a long time been thought that ground coffee possessed antiseptic or disinfectant properties. During some experiments upon the food value of coffee recently undertaken by Lüdevitz, which were reported in *Pharmaceutische Centralblatt*, the chemist found that bacteria were retarded in their development in nutritive gelatine by relatively small quantities of an aqueous infusion of coffee. Bacteria, as doubtless everyone knows, play an important part in the phenomena of putrefaction. The caffeine contained in the coffee appeared to be the ingredient which is thus specially active in retarding bacterial growth; but on making experiments with pure caffeine upon infusions containing various species of bacterium, it was observed that its action was quite inconsiderable. It is rather to the empyreumatic substances formed during the roasting of the coffee-berries that the anti-bacterial action of ground coffee must be attributed. In connection with these results we may recall a fact which has long been known, namely, that when fresh raw meat is dusted over with ground coffee it can be dried without the least sign of becoming putrid.—*Grocer.*

THE COCKCHAFER.

Great injury is done to the roots of plants of all kinds by the grub or larva of the cockchafer, one of the largest of beetles, the noisy flight of which may now be heard in the twilight. The grub, says a contemporary, spends several years in the soil, and, as it is a voracious feeder, it is frequently the unseen cause of much damage to crops, its ravages being nowhere more apparent than in young plantations of forest tree. In the extensive forest areas near Cracow in Poland, the mischief had progressed to such an extent that the maintenance of nurseries was found to be impossible, the grubs invariably destroying the seedlings. Dr. Laszezynski now reports, however, that the lupin has proved itself of great value as an insectifuge plant. Last year, after the usual planting of seeds of forest trees, one part of the area was sown with seeds of the yellow lupin and the young forest trees upon this portion were untouched by the grubs of the cockchafer, whilst on the rest of the area the seedlings were, as usual, destroyed. It would be desirable to test amongst field crops the value of a remedy which has proved so efficacious in the case of forest seedlings, and it is suggested that beetroot and other field crops which suffer from this pest might be protected by the sowing of yellow lupin seed.—*South of India Observer.*

[Many long years ago Liebig advised the coffee planters of Ceylon to grow lupin as a green crop amidst their coffee trees, to be turned into the soil as manure. Had the planters heeded the advice it seems probable they would not have suffered as they did from grubs. Lupins as insecticides could well be grown on our upland patanas.—Ed. *T. A.*]

PROGRESS OF TEA CONSUMPTION IN BRITAIN:

RISE AND PROGRESS OF BRITISH-GROWN TEA AND DECADENCE OF THE CHINA TRADE.

Messrs. Gow, Wilson & Stanton have prepared one of those periodical reviews of the tea trade illustrated by coloured and graduated diagrams which convey distinct and vivid impressions regarding the progress of tea consumption and the progress or decadence of the supplies received from different sources. This document will be circulated to our subscribers with an early issue, and meantime we proceed to notice some of the more salient facts in the advance copy with which we have been favoured. On the first page there are nine circular diagrams showing the ad vance in the home consumption of tea during nine quinquennial periods between 1849 and 1889. The size of the last circle of the series is considerably more than three times the size of the first, the increase having been from 50 millions of lb., all China, in 1849, to 185½ millions, mainly British-grown, in 1889. For the first three quinquenniums only China was consumed, the figures rising in the period ended 1859 to 76½ millions. In the 1864 period commenced the competion of Indian tea, but China continued to advance until it attained its maximum in the 1879 period with 126¼ millions of lb. Then commenced the "down grade" process, to 110¾ millions in 1879 and only 61 millions (the figure previously attained in 1854) in 1879. The red colour inside the circle indicating Indian tea continued to enlarge until from 2,800,000 lb. in 1864 the figures rose to 96 millions in 1889. Ceylon was late in the field; but its progress from a small yellow spot, indicating 1½ million of pounds in the 1884 period, was phenomenal: the yellow having enlarged to a proportion of 28½ millions in 1889. Up to the end of 1859 only China tea was consumed in Britain, and of that only 76½ millions. In 1864 the consumption rose to 88½ millions, of which 2,800,000 was Indian. In 1889 the figures for home consumption in Britain were:—

China	... ...	61,100,000 lb.
Indian	.. ...	96,028,491 ,,
Ceylon	... ...	28,500,000 ,,
Total	...	185,628,491 lb.

Together it will be seen that Indian and Ceylon tea made up 124,528,491 lb. British-grown against 61,100,000 China,—or more than twice the quantity of the famous product of Cathay which once monopolized the market. So compete a revolution and in so short a period has seldom occurred in the trade in any great article of consumption and the progress of supersession has by no means reached its final limits.

The compiler of the paper remarks:—

In 1889 the quantity of China Tea used in Great Britain was *less* than the Home Consumption in 1854—35 years previously.

In 1889 the quantity of British Grown Tea used was *more than double* the entire Home Consumption in the same year, 1854.

In 1889 the quantity of British Grown Tea used was in excess of the entire Home Consumption in 1871—18 years previously.

In the first six months of 1890, the consumption of China tea was only 28,686,000 lb. against 31,418,000 in the corresponding period of 1889 or 30 lb. percentage per head of the population instead of 35, or from above one-third of the whole to considerably below that proportion. In the case of Indian the rise was from 46½ millions to 51½ or from a percentage per head of 51 to 54. The progress of Ceylon was from 13,066,000 to 14,583,000 lb., or from 14 percentage per head to 16. To quote again:—

The figures below the Diagram show that the Tea consumption has nearly quadrupled during a period of forty years—since 1849.

In the ten years ending—				lb.
1859 the Consumption had		increased about		26 million.
1869 do	do	further increased about	...	36 do.
1879 do	do	do	do	49 do.
1889 do	do	do	do	25 do.

The quantity used annually per head of population had increased as follows:—

1849.	1859.	1869.	1879.	1889.
lb.	lb.	lb.	lb.	lb.
1·81	2·67	3·63	4·68	4·91

The increase in the actual weight of Tea used during the *last* ten years, was small when compared with the preceding periods. This may probably be in a great measure accounted for by the large proportion of Indian and Ceylon Teas used in the *latest* period. Theso Teas being so much stronger than China Tea, a greater number of cups can be prepared from the same weight of Tea—thus rendering British Grown Teas far more economical than China. It therefore, seems not improbable that a further expansion may take place in the Home Consumption as the *displaceable* quantity of China Tea becomes gradually less.

Reduction of Duty.—On the 1st May, the Tea Duty was reduced from *sixpence* to *fourpence* per lb.

The last time an alteration in the Duty occurred was on the 1st June, 1865, when it was reduced from one shilling per lb., to sixpence per lb, a reduction from 1s 6d per lb. having been made during 1863.

Although a reduction from 6d to 4d, at a time when the price of Tea is so slow as to bring it within easy reach of almost every class of the community, is not a parallel case to a reduction in the Tax from 1s to 6d per lb., at a period when the price of Tea was double its present figure; it may nevertheless be of interest to compare the average consumption during the five years just preceding 1865 with that of the five years immediately following, viz:—

	Average Annual Consumption 1860-1864.	Average Annual Consumption 1866-1870.
	lb.	lb.
	81,464,027	109,883,329
Per head of	lb.	lb.
population...	... 2·79	3·61

It may be mentioned that the average Consumption per head of population, has remained almost stationary during the last seven years—probably for the reasons given under the previous heading.

It is too early yet to judge of the effect of the reduction just made in the Duty, and it may be a mere coincidence that the Home Consumption during the last six months should show an unusually large advance—the whole of which is made up of clearances since the 1st May.

The immediate effect of the alteration in the Duty was to produce a strong demand for the lower grades of Indian and Ceylon Teas, and even a temporary but very transient demand for low priced China Tea. This demand was doubtless caused to meet an expected enquiry from the public for cheaper Teas.

This arrestment of the rate of progress, although undoubtedly due to the superiority of the British-grown teas, is a serious matter for India and Ceylon, which are so rapidly increasing their output of tea, and no effort should be wanting to open up new markets. It is satisfactory to learn, as we do further on, that the progress already made is promising. A diagram shows that medium Indian pekoe went down in price from 1s 6d per lb. in 1880 and 1881 to 9¼d and 10½d in 1890; the downward course of pekoe souchong in the same period having been from 1s 3d to 8½d and 9d per lb. In view of a stationary consumption in Britain and lowered prices, our readers interested in tea (the great majority) will eagerly scan the

figures for exports from Britain, which are, of course, additional to exports direct from India and Ceylon to markets other than that of Britain. Here are the figures for the first half of 1890, which we trust may expand ten-twenty-thirty-fold before the expiry of the decade on which we have entered:—

Export.—Since the 1st January, the exports from Great Britain of Indian and Ceylon Teas have been shown separately from those of China Tea in the official figures. It is satisfactory to know that
lb. lb.
1,443,994 of Indian Tea, and 651,968 of Ceylon Tea were exported from Great Britain during the six months ending 30th June.

These exports were distributed as follows:—

	Indian. lb.	Ceylon. lb.
United States of America ...	423,776	189,636
Canada	235,595	96,203
Turkey	256,634	3,121
Holland	173,414	85,234
*Germany	47,391	121,842
Russia	15,664	6,943
France	22,172	9,040
Other places	269,348	139,949
	1,443,994	651,968

* Probably part of the Tea exported to Germany was for Russia.

On these figures the compiler makes remarks, some of which we quote:—

United States of America and Canada.—The exports to these countries are highly encouraging. Perhaps of all export markets, these two are the most promising. It is now beyond question that Indian and Ceylon Teas have at least taken firm root in these countries, and that the development of an important and increasing trade is merely a question of time. Wholesale houses in the large Tea drinking centres are keenly alive to the change which has of late been taking place in the public taste—and are already learning that it is to their interest to foster a trade which they see is an increasing one.

Both the Associated Tea Planters, Limited, and the Ceylon Planters' American Tea Co., Limited, are doing a good work respectively for Indian and Ceylon Tea. They are both working on somewhat similar lines in so far as, in addition to a wholesale business, they have each opened retail depôts in New York. They are doing their utmost to bring their respective Teas under the immediate notice of the consumers. As prospects open, their retail depôts will probably be extended to other towns, and their means of spreading information concerning Indian and Ceylon Tea be proportionately increased.

Other agencies of various kinds are also at work and there are strong grounds for believing that both these important markets will before long become extensive buyers of British Grown Tea.

Then follow references to South America and South Africa, about which we are not so sanguine as the writer. The races of Latin origin, and especially those with a large admixture of Indian blood, seem incapable of settling down to peaceful government and commerce, and it is surely discouraging that the recent outbreaks of revolution and war should have followed so quickly on the grand pan-republican demonstration in the United States. For South Africa, Natal *could* grow tea, but the crusade against Indian labour may prevent the development of the enterprise. We turn with far brighter hope to the as yet youthful British colonies of the south. The compiler of the review writes:—

Our Australian Colonies already draw considerable supplies from India and Ceylon and will no doubt continue to increase the proportion of these Teas used. The exports of Indian Tea from Calcutta to Australia and New Zealand, from 1st May, 1889, to 30th April 1890, in the past three seasons were as follows:—

1887-8. lb.	1888-9. lb.	1889-90. lb.
2,408,019	2,869,184	3,595,712

It may also be mentioned that the direct exports of Ceylon Tea to these places for the past six months were nearly 1,000,000 lb.

The Paris Exhibition and the markets of Russia and Constantinople are referred to. But Russia will shut out British tea if she can, and we see little ground for expecting that the effete coffee-drinking Turks will ever become good customers for tea. But who can say? The consumption of tea in Britain itself was only 1·81 lb per head of the population in 1849, while now it verges on 5 lb, the figure for 1889 having been 4·91. Of the various foreign countries and British Colonies mentioned the compiler says:—

All these openings, insignificant though some of them may appear, form an important total in the aggregate and may eventually prove of *inestimable* value to the continually increasing production which is taking place both in Indian and in Ceylon.

The progress of Travancore as a tea-producer is specially noticed. There are 4,700 acres in cultivation, and the exports have risen from 3,577 lb. in 1882-3 to 678,363 in 1888-9. It is tsated that

Some forty different estates were represented in the London auctions last season, comprising a total of over 9,000 packages. In this district, Tea can be produced of good quality, well suited for self drinking, as also for blending purposes.

Of course every case of this kind reported constitutes an additional reason for the most active and persistent efforts to cultivate new markets for tea. There is a diagram showing the monthly average Home Consumption of China, Indian and Ceylon tea, during 26 years. From this we learn that China commenced in 1864 with 7½ millions of pounds per month, rose to 10½ millions in 1879, and sank to 5 in 1889. India, which began with about ½ million in 1864, has gone on steadily and rapidly rising to 8 millions in 1889. The progress of Ceylon has been still more rapid from a few hundreds of thousands in 1884 to 2½ in 1889. The percentage of Indian tea to the whole consumption rose from 3 per cent in 1864 to 52 per cent in 1889; while the rise in the percentage of Ceylon has been from 1 in 1884 to 15 in 1889. The percentages of India and Ceylon together make up 67 per cent of British-grown tea consumed in Britain last year.

The details we have thus noticed and quoted are very interesting and in many respects important. With the progress of population, wealth and temperance, we have every right to expect a corresponding increase in the demand for the wholesome and fine quality tea we produce; and in this case we have the satisfaction of feeling that what subserves our interests as producers is entirely beneficial to the consumers.

OLD BONES IN BENGAL.

The Government of India, in their No. 67—12-1, A, dated the 4th October 1889, have invited the attention of Local Governments to the increasing exportation of bones from India, and asked the Provincial Department of Land Records and Agriculture to embody remarks on the use of, and trade in, bones in their annual reports. The following is the information which has been gathered on the subject:—

(1) Source and Use of Bones.—Within the last few years the collecton of bones from village wastes, for exportation to Calcutta, has become the re-

gular profession of a low caste of Hindus—Chamars—in the central and western districts of Bengal proper, and is gradually extending to the outer parts of Bengal, in proportion to the increasing demand of the Calcutta mills, and the extension of railway communication. Heaps of raw bones collected for transport to Calcutta may now be seen along the railway and principal river routes of Bengal. Bones are also collected by the indigo-planters of Behar for use in their indigo land. Many of them have erected mills for grinding them to dust. In Lohardugga many tea-planters make their own bone-meal, and use it as a manure for tea-plants. The bones are collected locally, and coarsely ground by the *dhenki*. The fragments are not so fine as are turned out by the mill, nor are they required to be very fine for a slow-growing perennial like tea. The bones brought into Calcutta are bought up for manufacture into bone-meal. There are four or five bone-grinding mills at the present time in and near Calcutta. With the exception of a comparatively small quantity of bone-meal sent out to tea-gardens, the whole of the output of the mills is destined for export.

(2) Price of Bone-meals in Calcutta.—The price of bone-meal ranges from R2 to R2-8 per maund. There are several sorts (about 10 in number) distinguished according to degrees of fineness and purity, the best of which resembles *satu* or parched barley meal, both in fineness and colour.

(3) Means of producing Bone-meal cheaper in Bengal.—Raw bones as they come from the Chamars may be bought in the mofussil at eight annas per maund or less. In the tea-gardens in and near Ranchi they are delivered by the collectors at the rate of five annas a maund. At Dumraon in Shahabad bones have been collected at a cost of four annas a maund, and at Julpigoree Mr. Donald Sunder, Settlement Officer of the Western Dooars, has arranged with Chamars to have bones delivered at the jail at a price not exceeding six annas a maund.

A comparative trial was made in the Seebpore farm as to the relative merits, in grinding bones to dust, of the *dhenki* and an English-made bone-mill supplied to the department by Messrs. T. E. Tomson & Company. The results were that it cost two annas a maund less to prepare bone-meal with the *dhenki* than with the mill. Under the circumstances the *dhenki* can be safely recommended as a cheap and effective means of crushing bones. If ryots ever take to the use of bone-meal for manure, they will not have recourse to complicated machinery, but will use the *dhenki* in very much the same way that they grind wheaten and barley flour themselves, rather than buy the machine-made article.

(4) Experiments in Bone-meal through Ryots.—Numerous experiments to test the efficiency of bone-meal as a manure for paddy have been made in Burdwan and Hooghly. It is not always possible to show the results of the experiments in bone-meal in the form of a statement comparing the outturn of plots manured with it, with that of unmanured plots, for these reasons—(1) that in most of the experiments bone-meal was mixed with saltpetre, hide-salt, &c., so that it cannot be ascertained how much of the increased yield was due to each of these manures; and (2) that the experiments made by ryots are devoid of precision and cannot be thoroughly relied upon. The best guide to the value of this manure would be the evidence of the ryots who have tried it. In the Annual Report for 1886 87 mention was made of the steadily increasing demand for bone-meal in villages where it had been used in the preceding year. The results of the ryots' experiments in this year were also encouraging, as the figures given in the Appendix H. show. They give an average increase of 570 lb. of paddy per acre obtained by manuring with 240 lb. of bone-meal. The money-value of the increase in a year of ordinary prices may be taken as R9-8, while the price of 240 lb. of bone-meal applied is only R6 at its present high price in Calcutta. Experiments made with bone-meal on paddy, did not succeed in 1887-88 owing to great deficiency of rainfall; and in the following year (1888-89) they totally failed on account of floods, but the ryots who made the experiments appear to be very much interested. Last year an application was received from a single person for fifty maunds of bone-meal, which was supplied and paid for by the applicant. Inquiries were made in some of the villages in which bone-meal had been distributed in previous years. The testimony of the ryots and farmers was, according to Mr. Basu, nearly uniformly to the effect—

(1)—That bone-meal is quite as good as manure for paddy, potatoes and sugarcane (the chief crops of the village) as oilcake.

(2)—But that its effect does not last for more than a year, and according to some, a field manured with bone-meal will yield heavily in the first year only.

(3)—That better results were obtained in sandy than in clayey soils.

In Hooghly and Burdwan oilcakes (castor-cake in particular) are now being very largely used as manures not only for sugarcane, potatoes and various vegetable crops, but also for paddy, the chief staple of these districts. Although bone-meal is acknowledged to be a good manure, oilcake is believed to be superior to it in many respects. Besides that it is much cheaper than bone-meal, it is open to no objection on the ground of caste feeling. Until, therefore, bone-meal can be offered at cheaper rates than oilcake, there is no hope of its general adoption in native agriculture.—*Pioneer*, Aug. 18th.

INDIA'S POVERTY AND HOW IT CAN BE REMEDIED.

Here is the truth, plainly spoken:—

A correspondent writes to the *Madras Times*,—the poverty of India is becoming proverbial. In order to mitigate this rising poverty of India, there is a loud demand for technical institutions, in order to revive the old industries of this great empire which are now on the decay, and to encourage the arts *in esse* and *in posse*. The Good British Government, which has already conferred several priceless boons on India, is also opening technical institution for the amelioration of the poverty-stricken classes. India is thought to be the poorest country in the world. When a careful examination is made as to her real position, one is constrained to say that it is the richest in the world; but the apathy of the natives, in commercial enterprises and in agricultural pursuits, has rendered this Empire the poorest in the world. Let us therefore briefly examine the causes which underlie this poverty. There are many men here who have amassed a good deal of wealth in different walks of life. The wealth so accumulated by them is, as a general rule, spent in ways which are of very little benefit to the country. Some of these wealthy people spend a mint of money in taking long pilgrimages, in erecting costly temples, in performing the marriages of their infant sons and daughters, some in preparing costly jewels, and some in immoral ways; besides these there is another set of superstitious people who keep the money in their iron safes and actually worship it; if the money that is spent in all these ways is laid out in such commercial enterprises as opening of Banks, the opening of spinning and weaving companies, and other mechanical and engineering works, how useful and beneficial would these be in reducing the powerty of India. The mineral resources of this fertile land are great. It boasts of gold, iron and coal fields and several

other mineral products. If all the wealthy classes who say that India is becoming poorer day by day would lay out their money in opening companies for working the gold, iron and coal mines, for how many people would such undertakings provide a living? The natives who accumulate wealth either by hook or crook are naturally reluctant to lay out any portion of it in any useful undertaking, but their sole aim is to save money somehow or other, and yet we find such men sitting in their bungalows and storied houses saying that India is getting poorer.

The natives, through this apathy for such enterprises, have left this fertile soil in the hands of foreigners, who have formed themselves into many companies, and opened railways, gold mining companies, cotton mills, paper mills, and several other engineering and mechanical works, which give the working classes not only a living, but also leave a sufficient margin of profit and interest on the outlay. If the natives were to open such institutions, it would not only be a very great boon, but they would also retain the wealth of the land in their own hands; but under the present state of things, the wealth of India finds its way into the hands of foreigners. The natives, who hoard up wealth without making any use of it, are clamouring for technical institutions. No doubt such institutions would be of immense good to the people in giving them technical education; but those who have received such education would even then have to depend upon the English merchants and companies for their livelihood; agriculture is the backbone of India, but still we see that such an important source of industry is greatly neglected. When nature withholds its gifts, in sufficient abundance, the poor ryot is obliged to starve. If the well-to-do people assist the ryots at such critical times, and introduce improved machinery in tilling the soils, how much of the ryots' poverty would be averted. At present India is depending on Europe and other foreign countries for numerous articles such as muslins, matches, umbrellas, &c. If these worshippers of Mammon, who daily cry that India is becoming impoverished forgetting that it is their own apathy which is bringing about this calamity start companies for manufacturing these articles, how much would such enterprises mend the poverty of India. If all the natives would lay out the money that they have laid out on jewels, which is only a profitless investment, in other profitable and useful ways, then the poverty of India would be greatly diminished.

India is a poor country because the natives are not an enterprising nation; it is poor, not because its mineral products are less fruitful and profitable but because they are neglected by the natural sons of the soil; it is poor because the well-to-do classes do not wish to lay out their money on any profitable and useful undertaking. From Cashmere to Comorin there are wealthy rajahs, zemindars and other men who fling away a good deal of money on useless undertakings; if all the money that is so flung away were laid out in the opening of some useful and paying institution, would India then complain of her poverty? The proverty of India is mainly due to the lack of commercial enterprise on the part of her sons. The sister presidencies of Calcutta and Bombay are far better than Madras. The Baboos of Calcutta and the Parsees of Bombay are far ahead of the Madrassee in commercial pursuits, and hence it is that those two presidencies are richer than Madras. Can any one in this City of Madras point out to me one mill or factory which has been opened by a company of Madrasees, besides the cotton mill at Bellary, opened by Mr. Sahapathy Mudelliar, and the rice pounding, and oil mills, opened by a native merchant of Madras on the Tiruvattoor High Road? If the advocates who suggest measures and means for mitigating the evil of India's proverty sitting in their comfortable quarters, were to follow in the footsteps of the men named above I am sure that the proverty of India would be mitigated to a certain extent. The cause of this property is nothing more than the apathy of the people in respect to commercial enterprises.—*Indian Agriculturist.*

TIMBER AND FOREST PRODUCE GENERALLY IMPORTED INTO AND EXPORTED FROM CEYLON.

In the appendix to the interesting report of Col. Clarke on the Forest Department, there are memoranda by the Collector of Customs showing the imports and exports of forest products for 1888 and 1889, details of which, at this juncture, will be interesting to a large class of our readers. In the imports of 1888, the item "ashwood for oars" occurs. This ashwood must have been used by some of our boat clubs, and the import, only 1 package, is not repeated in 1889. Of "cedar wood," described as white cedar wood in Col. Clarke's report, used as staves for oil casks, 141 logs and 128 pieces were imported in 1888 and 290 logs and pieces with 7 packages in 1889. Can this be the produce of the "white toon," the true *Cedrela toona*, grown so largely in the lower hill forests of Southern India? If so there is an additional reason for trying to grow this tree in the lower country of Ceylon, while the red toon receives attention at higher altitudes, where that variety, with coral red branchlets and serrated red leaves, flourishes. Of "planks not described" 324 pieces and 16 packages were entered in 1888 and 1,423 and 6 respectively in 1889. Of pitch pine wood 122 packages are down for 1888. Of sandalwood the imports in 1888 were 4,248 pieces and 7 packages, while in 1889 the imports were 926 pieces and 33 packages. This scented wood is, no doubt worked up into boxes and curios for sale mainly, like tortoiseshell articles to steamer passengers. Of timber and wood not described, 786 pieces and 881 packages were imported in 1888, and 190 tons, 264 logs, 278 pieces and 91 packages in 1889. Of teak planks and teak 2,796 logs, 3,183 pieces in 1888, and 1,217 logs, 2,001 pieces and 531 squares in 1889. Of "boards" 3,032 pieces and 500 packages in 1889. Also "Devadara" (?) wood [cannot be Deodora] 35 packages. "Rough oak planks" 1,200 pieces. The oak timber was probably used for the repair of vessels built of that wood. "Red wood" [? red toon] 13 packages, and actually, 1 package of our own special dye-wood, sapan. The total amount of timber of every description imported in 1888 is given at 2,937 logs, 8,769 pieces and 1,029 packages. In 1889 the figures were,—190 tons, 1,761 logs, 8,960 pieces, 702 packages and 531 squares. There appears, therefore, to have been a considerable increase in the imports of 1889 over those of 1888. In addition to timber we get horns of sorts, 23 cwt and 54 packages in 1888 and cwt 263-2-5 and 41 packages in 1889. Of orchilla weed [for export?] no less than cwt 527-3-22 and 28 packages in 1888 and cwt 210·3 and 20 packages in 1889. Of skins of sorts we imported 11,413 pieces and 74 packages in 1888, and 27,003 pieces and 71 packages in 1889.

Turning now to exports from the island of similar products, we obtain figures which indicate an important branch of our commerce. It is very unfortunate, however, that a more distinct classification of timbers is not adopted, the very largest item being described as "woods of sorts." Of such woods the exports in 1888 were 2,828 packages, 6,909 logs; with 820,247 under "number," which we suppose indicates the contents of the packages added to the logs. In 1889 the exports under the same heading were 1,862 packages; 26,779 logs; 700,536 number. It would certainly be well if the Customs could secure the naming of at least the more important "woods of sorts" sent from the island. We must express the hope that the heading did not include any palmyra timber, which constitutes the next great item. The number of

palmyra laths and rafters exported is given at 286,296 in 1888 and 296,484 in 1889. For the roofs of buildings there can be no better timber than that of well-grown palmyra palms. "Timber, dye wood and root," chiefly sapan, no doubt (although we get cwt. 3,803-2-1 separately for sapan), was cwt. 642·2 in 1888, and cwt. 648-1-22 with 10 pkgs. and separately under the heading of sapan cwt. 1,674-0-16 in 1889. Better classification is required, to enable enquirers to discover whether any important dyewood other than sapan is exported from Ceylon. Ebony, for which Ceylon has been nearly as famous from far back antiquity as for cinnamon and pearls,* was exported in 1888 to the amount of cwt. 12,3-521-21 and in 1889 only cwt. 3,880-3-1. Col. Clarke has, in his report, explained the circumscribed export as due to a glutted market. We need scarcely remind our readers that ebony is the heart-wood of trees the outer shell of which is white, the amount of the valuable heart-wood varying with age and circumstances. Of sandalwood there was a trifling export of 5 under "number" in 1888. This was, of course, part of the sandalwood originally imported, for sandalwood is unknown in Ceylon except in the Botanic Gardens. Of our next most important cabinet wood after to ebony, that is satinwood, the exports for 1888 are given at cwt. 4,143·2-4 and 4,359 logs; in 1889 at cwt. 1,229-3, logs 1,519 and "number" 22. Of "ironwood" (including *palu*, no doubt, as well as the real ironwood, *na*) the exports were 1,475 logs in 1888 and 896 logs and "number" 10 in 1889. Of our fine and useful timber, halmilla, 349 logs were sent away in 1888 and 806 logs in 1889. Teak figures for 1 log in 1888 and "number" 35 in 1889: not likely to have been the produce of Ceylon. Of arekanut laths and rafters we exported 305 in 1888 and 415 in 1889; while coconut rafters figured for 259 and 1,718 in the respective years. Of "laths and rafters" not otherwise defined 8,290 packages and 4,809 in "number" were sent away in 1888, with 8,326 packages and 3,006 "number" in 1889. The large number of packages must surely have included palmyra laths and rafters, in which case the figures are very defective, and now that we have a forest department in full operation, it would surely be well that the customs authorities insisted on more definite information as to the nature and names of the timbers entering into the export trade of the island. Kitul (*Caryota urens*, or jaggery palm) laths and rafters to the number of 179 were exported in 1888 and 1,447 in 1889. The totals of the exports of timber for the two years were:—

	cwt.	packages	logs		
1888	20,941 3.26	11,121	13,093	and number	1,112,100
1889	7,433·0·11	10,288	30,000	„	1,003,674

Of forest produce exported we get for "horns of sorts" in 1888 cwt. 2,341-0-16; in 1889 cwt. 2,203 and 1 package. Hides and skins, in 1888 cwt. 7,598·0-26 and 347 packages; in 1889 cwt. 8,693-2-20 and 458 packages. The value of the skins of domestic cattle in Ceylon is greatly depreciated by the excessive branding of the live animals to which their native owners resort. Of the dye material, orchilla weed the export in 1888 was cwt. 489-1-9 and one package; in 1889 cwt. 502-3-20. Of "tanning bark," not more definitely described, the export in 1888 was cwt. 747-2 and in addition "Velam bark" was sent away to the amount of cwt. 530-2. In 1889 there is no separate mention of Velam bark, only of "tanning bark," of which the export was cwt. 582-3.—There can be little doubt that the tanning bark exported from Ceylon, was mainly the produce of *cassia auriculata* and *Acacia leucophlœa*. In the latest published number of the *Indian Forester* there is a paper on dye stuffs, from which we take the following extracts:—

Acacia Leucophlœa.—The bark of *Acacia leucophlœa*—the reru or safed-kikar—attracted attention at the Conference; and the leathers exhibited from various districts in India as prepared by means of this material were considered superior to any others shown.

Cassia is referred to in the same article and it is stated:—

The leather tanned by the bark of *Cassia auriculata*—the tarwar—was considered at the Conference much superior to what could have been inferred from the examination of the highly coloured bark.

Then we have a paragraph on the *nelli* of our patanas:—

Emblica Myrobalan.—A few of the tanners present were familiar with the Emblic myrobalans—the fruit of *Phyllanthus Emblica*—daula, ámla, aonla—though they had never before seen the leaves. But the same objection exists with regard to these as has already been alluded to under *Anogeissus*. Unless a tanning half-stuff could be profitably prepared for export, it would be hopeless to expect a trade to be done in the leaves. They are doubtless good and useful tans, but have to compete with others that can be landed in the home markets at lower prices. This argument seems perfectly just and applicable to the leaves, but since it pays to export the fruits of the true myrobalans, it would seem as if the question of a future trade in the Emblic myrobalan would turn on the percentage of tannin which it possesses and the colour it imparts to the leather.

We never before heard of the acid and astringent *nelli* fruits and the leaves of the tree being used for tanning purposes.

Gamble writes of *Acacia leucophlœa* (*Mimosa leucophlœa* of Roxb. Fl. Ind.) that it is known to the Tamils as *velvaylam* and *vel-vaghe* and to the Sinhalese as *katu andara*. He describes it as

A moderate-sized or large deciduous tree. Bark ½ inch thick; colour varying with age, grey and smooth when young, dark brown, almost black, and rough when old, exfoliating irregularly in patches and strips. Sapwood large; heartwood reddish brown with lighter and darker streaks, extremely hard. Pores moderate-sized, uniformly distributed in patches or short irregular concentric belts of white tissue which are prominent in, and alternate with, the dark-coloured firm tissue which separates the medullary rays. The latter are white, fine and moderate, and often slightly bent,

The weight of the wood is given at 45 to 59 lb., and it is added that

It seasons well and takes a good polish; is strong and tough, but often eaten by insects. It gives an excellent fuel. The bark is eaten in times of scarcity; it is used in preparing spirits from sugar and palm juice, to precipitate by the tannin it contains the albuminous substances in the juice. It gives a fibre used for nets and coarse cordage. The young pods and seeds are eaten, and the gum is used in native medicine.

Of assia auriculata the same authority states that it is a shrub of Central and Southern India and that its bark is used for tanning and dyeing leather and its seeds as an application for opthalmia.—Of *Emblica myrobolan*, the *nelli* of the Sinhalese and Tamils, Gamble tells us, under the title *Phyllanthus Emblica*, that it is

A moderate-sized deciduous tree. Bark somewhat less than ½ inch thick, grey, exfoliating in small irregular patches. inner substance red. Wood red, hard, close-grained, warps and splits in seasoning

* Sir George Birdwood in a paper on the Industrial Arts of India states that the "Periplus of the Erythrean Sea," which belongs to the first century of the Christian era, notices that Omana imported from India ebony. He adds that Schlieman found carved Indian [Ceylon ?] ebony in one of the mounds of the Troad identified by him with the site of the city of Troy.

No heartwood, annual rings not distinct. Pores small and moderate-sized, uniformly distributed, often subdivided or in short radial lines. Medullary rays moderately broad and broad, the distance between two rays generally greater than the transverse diameter of the pores. Medullary rays very prominent on a radial section, giving the wood a handsome mottled appearance.

Mendis gave 49 lb. as the weight of the Ceylon wood but that of Mysore is given at 67. Gamble adds :—

The wood is durable under water, and is used for well-work; also for agricultural implements, building and furniture.

The bark is used for tanning and in medicine; chips of the wood are said to clear muddy water. The fruit is the Emblic Myrobolam, and is used as a medicine, for dyeing, tanning, and for food and preserves. It gives a gum, which is not used.

PLANTING IN NETHERLANDS INDIA.

In East Java, this year's coffee crop has turned out poorly but prices rule high. The *Locomotief* mentions a firm at Samarang which last year drew sixty thousand piculs from its estates, but which expects only 112,000 piculs this year. In East Java, the tobacco crop also shows bad signs.

The Batavia *Nieuwsblad* says that the Netherlands India Government has decided upon issuing Java tea to the army there. Similarly, the Government has tried to depend as much as possible on local rosources in the supply line, but the Home authoritiesi invariably thwarrt these good intentions by giving preference to articles from the Netherlands. This especally seems to be a failing of the Colonial Office.

The *Locomotief*, in noticing the expansion of planting enterprise in Netherlands East Borneo, wonders why tobacco should be such a favourite in that line of business. It deems that a commercial company with a few handy steamboats and convenient trading stations on the coast could carry on a profitable barter trade in local produce. Pulo Laut, a coal island in the neighbourhood, would prove useful in supplying fuel.—*Straits Times*, Aug. 27th.

THE CHANDPORE TEA COMPANY.

The Chandpore Tea Company, Limited, has just been registered, with a capital of £32,000 in £10 shares. Its object is to acquire, on such terms as may be agreed upon, the Chandpore and Begum Khan Tea Estates, situate respectively in the district of Sylhet and province of Assam, with all lands appertaining thereto, and the goodwill, property, and assets of the business partnerships carried on by the respective proprietors thereof in connection therewith as the same stood on January 1st 1890, as going concerns, and to carry on and work the same estates. The first subscribers, who take one share each, are:—S. Cochrane, 20, Threadneedle Street, E.C.; Major-Gen. W. M. Campbell, Junior United Service Club; W. Shaw, 16, Exchange Square, Glasgow; J. R. Pedler, 9, Mincing Lane, E.C.; O. Steel, 34, Old Broad Street, E. C.; J. S. Fraser, 34, Old Broad Street, E. C.; C. Sanderson, 46, Queen Victoria Street, E. C. There shall not be less than two nor more than five directors. The first are William Maxwell Campbell, William Shaw, J. R. Pedler, and Samuel Cochrane. Qualifications, £500. Remuneration, £50, divisible, provided that the fee payable to each director shall not exceed £2 2s. each for each meeting attended.—*H. and C. Mail.*

RAMIE AS FOOD FOR SILKWORMS.

(*Boehmeria nivea*, H. K.)

We were lately surprised to find that silkworms fed on *casuarinas*. Another surprise is the statement, which we quote from the *Kew Bulletin* for August, that the leaves of the rhea plant form suitable food for the silk-yielding insects :—

It now appears that the leaves of the Ramie plant may be used as a food for silkworms, in the same way as those of the mulberry and Osage orange (*Maclura aurantiaca*). All three plants belong to the same natural order *Urticaceæ*, and there should be no reason why they should not be found equally suitable. The following account of the use of Ramie leaves for feeding silkworms in the United States was communicated to the Foreign Office by Mr. A. de G. de Fonblanque, H. B. M.'s Consul at New Orleans:—

"A discovery has been made by a lady in Columbia, S. C., that may have a marked effect upon two great industries. For a number of seasons this lady has amused herself by feeding silkworms and sending a few pounds of cocoons to the Women's Society for the encouragement of the Silk Industry in Philadelphia. The extraordinary warmth of this winter caused the eggs to hatch far in advance of the season, and as the young leaves of the mulberry and the Osage orange had not put forth, our amateur was at a loss what to do. An account adds:

"'Seeing that the foliage of the Ramie in a neighbouring field was putting out, she gathered some and put the worms upon it. They fed ravenously, and she kept up the supply until the Osage orange leaves appeared. Then she divided her worms equally, feeding one set with Ramie, the other with Osage orange. She kept the cocoons separate and sent them to Philadelphia. The experts there were astonished at the size of those spun by the Ramie eaters, and wrote to the lady to know what she had done to secure them. They were not only larger, but the silk was finer.'"

"If further experiments should prove that Ramie leaves can be depended upon for silkworms' food, then a great impetus will be given to the production of this valuable article in the South, while it will add to the profits of those who raise that plant for its fibre."

CEYLON CACAO.

(*Theobroma Cacao*, L.)

The following article is from the *Kew Bulletin* of August. It will be seen that although the production of cacao in Ceylon is limited its quality is of the very highest :—

The cacao industry, until of late years, has been chiefly confined to the tropical parts of America, Mexico, Guatemala, Venezuela, the United States of Colombia, Brazil, and the Guianas, being the chief producers of cacao on the mainland, while Trinidad and Grenada have taken the lead amongst the islands of the West Indian Archipelago. The species of *Theobroma* yielding commercial cacao are natives of Central and South America, and it is but natural to find that the largest areas under cultivation are situated near those regions. Plants of cacao were introduced at an early period to the East Indies, and they are now found under cultivation in most tropical countries. Until quite recently, however, the best qualities (as also the largest quantities) of commercial cacao were obtained from tropical America. The celebrated cacao of Venezuela, known as Caracas Cacao, the choice cacao of Soconusco, in Mexico, and the selected sorts of Trinidad Cacao were believed to be unapproachable for quality and flavour. It appears now, however, that even the best produce of tropical America does not reach the high standard which has been attained by Ceylon Cacao. In a recent letter received from Mr. J. H. Hart, F.L.S., Superintendent of the Botanical Gardens, Trinidad, he states: "For several mails I have noted in the *Public Ledger* the increasing prices obtained for Ceylon Cacao in comparison with that obtained for the best Trinidad Cacao. In the Account Sales dated the 29th March it is shown that Ceylon Cacao is actually worth more by 24s 6d per cwt. than the best Trinidad marks. The difference between the inferior marks is greater still." In view of these facts the planters in Trinidad and elsewhere are keenly discussing the merits of Ceylon cacao, and seeking for the causes which have led to the production of an article so superior to anything produced before. It is true that the quantity of cacao produced in Ceylon is relatively very small. In 1889 Ceylon produced only

17,164 cwt., while the production of Trinidad alone was probably not far short of 125,000 cwt.* The general opinion appears to be that the superior quality of Ceylon cacao is greatly due to the more careful and effective methods adopted for fermenting and curing the beans. The produce is said to be sent into the market in a bright and attractive condition and free from tho dirt and mucilage which too often spoils the appearance of West Indian cacao. Again the "soil and climatic conditions" in Ceylon are said to favour the production of cacao with a delicate flavour and good colour. There is, doubtless, some amount of truth underlying all these opinions, but none of them touch upon an important element in the inquiry, and that is the character of the plants yielding the produce.

The cultivated forms of *Theobroma cacao* are broadly divided into two sorts, known in Spanish speaking countries of America as cacao Criollo and cacao Forastero. At one time cacao Criollo was largely, if not exclusively, cultivated in Trinidad, but owing to a disease (described as a "blast") which visited the plantation some time during the last century this sort was discarded in favour of a more robust and hardy sort, to which the name of Forastero (or foreign) cacao was given. The Criollo cacao is said to yield the Caracas cacao of Venezuela, but it is now comparatively rare in Trinidad and Grenada, and only sparsely found in the other West India Islands. The cacao first introduced into Ceylon and the East Indies, probably by the Dutch in the beginning of the century was the criollo sort, and if the bulk of the Ceylon produce now received in this country is derived from criollo trees that would in a great measure account for its superior quality. A Trinidad plantor writes: "The Criollo Cacao is much better flavoured than any other, and requires but three days' fermentation." This aspect of the case has already been dealt with by Dr. Trimen, F.R.S., Director of the Botanical Gardens, Ceylon, in his Annual Report for the year 1885:—

"There has been somo demand during the year for seed of the Trinidad varieties at Peradeniya, and the belief is general that these large growing kinds are hardier than the old Ceylon sort. Since the date of my last report I have arrived at the conclusion that the various 'pale-fruited' kind (see Report for 1882) sparingly cultivated in Ceylon, as well as all the strains of these new Trinidad plants, are to be referred to the 'Forestero' class of cacao. All of them, whatever the colour of the pods—purple, dark-red, pink yellow, or pale-green—have seeds ('beans'), which are flattish in form, and purple or violet internally, and become very dark after curing. Our old cacao, on the contrary, has the pod nearly always red (occasionally bright yellow), and the seeds are more rounded in shape, and always white or yellowish on section when fresh, becoming red after preparation for the market. As to the proper name of this latter sort, I may quote a portion of a letter which I addresed to the *Observer* newspaper, in November last, upon the subject:—

"'The fruiting of the selected and named varieties sent from Trinidad in 1880 and 1881 has since shown that all these names (Cundeamor, Cayenne, Verdilico, &c.) are applied to forms of what is known there as 'Forastero' cacao, and that none of the purple seeded kinds are of the 'Criollo' or 'Caracas' variety. It will therefore be well to use for the future the name 'Forastero' for them here also.

"'This, being the case the question naturally arises as to the ordinary red cacao of Ceylon. What variety is it; and is there anything like it grown elsewhere? For some time I have been becoming more convinced that it is *this* that is the 'Caracas' or 'Criollo' cacao, and I might have taken stronger ground on the matter than I did in my last report. Mr. Morris of Jamaica, who has had good opportunity of investigation the cacaos, both in a wild and cultivated state tells me that he knows of 'only one kind with the cotlycdons white or whitish, 'and that is what is known as Caracas cacao.' This, it is well known, is now a rare kind in the West Indies, and scarcely to be found on Trinidad estates, having died out, though formerly largely grown there. Evidently Ceylon obtained its plants before this change had occurred. The high quality of "Ceylon cacao" is thus explained, as well as its delicate temperament."

It only remains to point out that the preparation of Ceylon cacao differs in one important point from that generally adopted in Trinidad and other parts of tropical America. In Ceylon, after the beans are fermented the pulp is carefully removed by washing, and the result is the production of a clean, bright looking sample, free from mucilage and discolouration of any kind. In the West Indies, after fermentation, the beans are generally neither washed nor thoroughly rubbed. The mucilage is allowed to dry upon them. On some of the best estates in Trinidad the mucilage is carefully removed by rubbing, and sometimes a red absorbent earth is used to assist the process as well as to give an attractive colour to the beans. The various methods adopted for fermenting and curing cacao in the West Indies are well given in a series of Essays published in the *Agricultural Record* (the Journal of the Central Agricultural Board of Trinidad) for March 1890. The present position of Ceylon cacao in the London Markot is discussed in the following letter, for which we are indebted to the courtesy of Messrs. Shand, Haldane & Co., of 24 Rood Lane, E. C.:—

Messrs. LEWIS & NOYES to Messrs. SHAND, HALDANE & Co.

14, Mincing Lane, E. C., July 2nd, 1890.

Dear Sirs,—The following remarks may give some explanation of the peculiar position held by Ceylon cacao as compared with Trinidad.

The comsumptive demand during recent years has caused manufacturers generally to give their attention to the making of a cocoa and a chocolate for which Ceylon is especially adapted on account of its bright chocolate-coloured break and mild flavour in preference to the strong flavoured Trinidad sought after a few years ago.

The lightness and easy fracture of the shell through the removal of mucilage renders the loss in weight less to manufacturers and likewise facilitates the working.

To the demand exceeding the supply (the largest output from Ceylon in one year being less than 20,000 cwt), together with the fact that the crop is shipped almost entirely to this port, thus creating keen competition from tho markets of all other manufacturing countries, may be attributed the existing high prices.

We may mention that should the output from Ceylon be, say 50,000 to 60,000 bags, of the same weight per bag as those from Trinidad, a range of prices much on a parity with that of good Trinidad would follow.

We have recently noticed a few parcels of Trinidad cacao cured similar to Ceylon, in which the outward appearance has to some extent been obtained' but the light break and mild flavour are wanting.

Any further information which you may require we shall be happy to furnish.—Yours, &c.,

(Signed) LEWIS AND NOYES.

The sample sent herewith is from North Matale estate, the property of the Ceylon Land and Produce Company, Limited.

OYSTESS IN NORTH BORNEO.—In a paper on this settlement in the *British North Borneo Herald* it is stated:—Edible oysters are also found on the rocks near the coast; these are collected and dried by the natives and sold to the Chinese traders who export them to China. The same oyster does not object to make its home on the mangrove branches between high and low water, in fact oysters may be said to grow on trees. It would thus appear that growing trees act as substitutes for the fascines used in European oyster culture. It is added Keemah or clams are also collected, dried, and exported in the same way.

* In 1885 the actual production was 122,585 cwt.

BRITISH GUIANA:

THE COLONY OF SUGAR AND GOLD.

It was natural enough that Sir James Longden should o requently refer to "what we did in Demarara," (the Demerary of many writers), and that Sir Arthur Gordon should praise the fertile soil and magnificent nutmegs and cacao of Trinidad. We have certainly very little in Ceylon to compare with the volcanic soil of the West India Islands and the marvellously fertile swamps (when drained by deep and broad canals) of the flats which form such prominent features in our South American settlements of Demerara and Berbice,—often referred to as "those fine islands in the West Indies" during the debates which preceded the abolition of slavery. With that event the once important cultivation of coffee in British Guiana dwindled to almost nothing, while cacao is but a secondary product. But from the persevering application of science, skill and industry to the staple sugar, Demerara and Berbice have been able to hold a good position both after emancipation and during the recent crisis occasioned by the beet-root sugar bounty policy of the continental nations. But now we learn that sugar cultivation is threatened by the rapid developement of an industry never so much as dreamed of when sugar was almost literally coined into gold, in the old days of slavery and protective duties. Gold is being collected in abundance amidst the alluvials of the great rivers which run up from the British colony into Venezuela and Brazil, and labour has been diverted from the production of sugar and rum to the gold diggings. In this fresh crisis we notice, from the proceedings of the Agricultural and Commercial Society, as reported in the very interesting journal *Timehri* that the colonists are not turning their attention so much to fresh labour drafts on India, as to the neighbouring colonies, especially over-populated Barbados, the Azores and, what is quite a new enterprise, to the Southern States of the American Union, where the possible solution of the problem of harmonious existence, side by side, of the whites and the negroes is in many places giving extreme anxiety. The now free negroes of America and others willing to do good work for fair wages are invited to resort to the British South American colony, scales of wages and other details being published as inducements. From an article in the magazine referred to we quote some interesting details regarding the progress of the gold enterpise in Guiana, to which, it seems to us, public attention has not been directed in a manner adequate to the importance of the results already attained and the promise afforded for the future. We quoted what was stated regarding this enterprise in *Timehri* of June 1887; and now, after the lapse of three years, the report is:—

With but scant encouragement, and suffering under great disadvantages, the industry may have said to have progressed by leaps and bounds, as indicated by the returns to hand for the different years. In 1885, according to official returns, 939 oz., were exported; in 1886, 6,518 oz.; in 1887, 11,906 oz.; in 1888, 14,670 oz.; in 1889, 29,327 oz.; and in the first six months of the present year about 27,000 oz., valued at nearly $500,000, have been already obtained, an amount not far short of the total output for 1889, which in itself had been more than double that obtained in the previous year.

The industry has become a very considerable source of income to the Government, for the royalty (at 90 cents per oz.) within the six months, has amounted to nearly $25,000; while but the merest nomiual expenditure on their part has been entailed.

A very noteworthy feature in the growth of the industry has been the perception of the fact, that gold is to be found in paying quantities over large areas of the colony. First in the Puruni and Cuyuni river districts, then in the river districts of the north-west, and now more recently in the Potaro district, the metal has been obtained in large quantities; and it may almost be regarded as certain that the upper districts of the Mazaruni, Essequibo, Berhice and Corentyne will be similarly productive.

The constant succession of rapids, cataracts and falls along the river courses, and the serious danger of these obstructions in the height of the wet season, render the natural water-way a serious drawback; and the genius of the engineer may be said to be the great hope of the future. Following his tracks through the recesses of the forest, come the pictures of an advanced and prosperous mining industry; of the inland settlements and villages, and possibly even cities, with their farms and clearings, where a wider agricultural development may be attained; and of a trade in timber and other forest products from regions at present untapped; while the easy access to higher lands will furnish health resorts from the coast; and the gradual clearing of the land by lessening the almost continuous extent of forest; will tend to an equalisation of climatic conditions that must have a marked influence in decreasing both the great periodic and constant swamps of the interior.

Already, however, the note of labour-alarm has been sounded, for the rapid development of the gold industry within the last two years, has been the means of drawing away from the sugar estates an appreciable quantity from the staff of labourers; and with the continued advance of the industry, it is but to be expected that the labour supply of the estates will be still further lessened. The question is thus a most important one, fraught with grave issues to the material prosperity of the colony, how best to maintain the staple sugar industry in full and vigorous swing, and, at the same time, to provide for and encourage the fullest development of the mineral wealth within our reach.

The absence of special encouragement from the Government may be due to apprehensions of trouble in two directions:—the disorganization of the labour supply for plantations and the balata rubber and timber enterprises, and the danger of complications with the border countries. Venezuela, indeed, has already been indulging in tall talk of war (!) to vindicate her rights. A cautious and conservative policy may be very good up to a certain point, but there can be no doubt that the ultimate result of the gold discoveries in the British colony and the bordering states will be to connect Georgetown, Demerara, with the capitals and chief towns of the great series of Southern American States, by means of the iron bands of the railway. Besides the sugar industry and the others mentioned, labour is required for extended fruit growing for the American market, considerable enthusiasm being awakened in regard to preserved plantains. Some of our readers may not be aware that our Dutch predecessors in Ceylon were in the habit of splitting ripe plantains longitudinally and drying them in the sun on mats. Of course the great difficulty in this mode of preparation is the necessity of watching against adverse weather and the depredations of crows and other animals. The late Rev. Mr. Thurston, therefore, when at the head of the Government Industrial School, baked the divided plantains and put them up in hermetically soldered tins, in which shape they were highly prized by children sent "Home" from Ceylon for education and by absent or retired colonists. Those who have tasted the

preserved plantains (properly bananas) will agree with us that they are equal if not superior to dried figs. Those dried in the sun are probably superior, but artificial heat gives excellent results. The mode adopted in British Guiana is to provide a bed of heated sand, over which is placed a platform of laths, and on this the slices of plantains are dried in a temperature of about 150°, until they part with the moisture which constitutes 75 per cent of their weight. We have often wondered that no enterprising person has given a full trial to this industry in our colony where "plantains" are so plentiful and so good. The American Fruit Drier does not seem to have given better results with plantains in Demerara than it did in Ceylon, when tried at our suggestion a few years ago. The following extract will show that a full trial of the British market is being made from Demarara:—

The Assistant Secretary laid over further samples of two varieties of dried bananas, as well as a specimen prepared with sugar. He had received an account of the first lot sent to England, which was very much liked and arrived in first-rate condition. The specimens then on the table were moister and retained more of the flavour of the fresh fruit than the first samples. He hoped to be able to prepare them in such a way that they would keep long enough for shipment and still be moist and full-flavoured. A number of sample boxes had been sent to England by the previous Mail, and other samples had been distributed to several persons in the colony, who had all expressed satisfaction with their flavour and appearance.

Again:—

Mr. Rodway laid over specimens of a great improvement in dried bananas, a sample from Trinidad, and also a box from Messrs. Finney and Lambert, who were preparing to carry out banana drying as a commercial speculation.

Of course papers on sugar cultivation and manufacture are prominent in the Journal, which opens with a discussion of "Diffusion of sugar cane, compared with double crushing in mills," by Mr. Neville Lubbock. There is also a paper on defecation by electricity. Unfortunately we in Ceylon ceased to take more than an abstract interest in sugar, long previously to the date when "failure" as regarded sugar on a large scale was repeated in the case of coffee. With abundance of rich manures, we could probably succeed in growing sugar which would properly crystallize, but in order to live planters must grow what will pay. There is a most fascinating collection of gossip about Charles Waterton (whose "Wanderings" are almost as interesting to young people as are the adventures of Robinson Crusoe) and his friend and father-in-law, Charles Edmonstone. Waterton was for six years working as the owner of plantations and slaves in Demerara, and Edmonstone, who was one of the "Keyzers" of the colony, earned the gratitude of his fellow colonists by a series of successful expeditions against runaway slaves and maroons. Waterton married Emondstone's daughter, who was on the mother's side the grand-daughter of an American Indian, thus:—

The Indian chiefs were rather important personages in those times, (in the early years of this century,) as they received the annual presents and distributed them to a considerable extent by favour. It naturally followed, that being commissioned by the government and provided with a silver-headed stick of office, an Arrawack chieftain thought himself a somebody. In the latter half of the last century a daughter of one of these *Owls*, as they were called, who went by the name of "Princess Minda" was married to William Reid, a Scotchman, and one of their children became Mrs. Charles Edmonstone. The gallant Burgher-Captain was therefore connected by marriage with the Arrawacks and no doubt this was one reason why he had such great influence over them. If, therefore, descendants of Charles Waterton exist, they have American Indian blood in their veins. We do not suppose the Scotchman William Reid, who married the Indian "Princess," was connected with the Sir William Reid, Baronet, who, after long residence in Demerara as a planter, came here to engage in the coffee enterprise in 1840, and with whom the writer was associated in pioneering work in Uva in 1840-41,—but the coincidence of name is certainly curious.

In the notice of Edmonstone, we have a glimpse of a reverse of fortune from eccentricity of conduct and instability of purpose such as is not uncommon in colonies, although, in the case before us, addiction to drink does not seem to have been added to moral aberration, the result of reading the rhapsodies of a man who was undoubtedly insane:—

Near the border of the clearing at Warrow's place lived the eccentric Swedenborgian, "Old Glen." His story was a curious one. Coming to Demerara as the mate of a merchant vessel, he received a grant of land, settled down, bought a few negroes, and in seven years gained an assured position, while after twenty years he became a man of some importance. Going on board a Dutch vessel one day he found the Captain reading one of Swedenborg's books, and being taken with the new religion Glen was very pleased when the owner presented him with several works of that mystic author. From this time he became an enthusiast. His estate was neglected, everything went wrong, the negroes ran away or became careless and lazy, and every day Glen became poorer and poorer. Having ordered a large consignment of the books of his beloved author, he was unable to pay for them, and consequently the estate was sold. Being destitute he set up as a preacher to the negroes, but this not being allowed, he went to Berbice and enlisted as a private soldier. Here he fell into disgrace for sleeping on duty and was sentenced to "run the gauntlet." In pity the commanding officer would have remitted the sentence, but Glen refused, and was so determined to receive his punishment that he would not pass his comrades until they gave him the customary blows, even going so far as to chide them if they did not strike hard enough. Returning to Demerara Edmonstone found him destitute and offered him a home at Warrow's Place. Glen would not live in the house but built himself a benab in the forest. He was very gentle and kind to the Indians, many of whom came to him for medical treatment, which he practised by means of some of the forest remedies. Among other kind actions he taught the little Edmonstones their letters, and Mrs. Waterton probably received the rudiments of her education from him.

There is a very interesting paper on the Mollusca of British Guiana, from which we observe that several of the many land shells (slugs and snails) are used as food. The Revd. D. J. Reynolds contributes "Jamaica Proverbial Philosophy," which gives a good idea of the shrewdness of "Quashy." For instance:—

When snake bite you; you see lizard, you run. The burnt child dreads the fire.

Cuss John Crow "peel head" and turkey pee pee bex. Offend one monk, and the lappets of all cowls will flutter as far as Rome. (Spanish.)

Cow tail cut off, God Almighty brush fly for her. God tempers the wind to the shorn lamb.

Quattie (the smallest Jamaica silver coin of the value of 1½d now out of circulation) buy trouble, hundred pound can't pay for it. Mischief comes by the pound, but goes away by the ounce.

The raven cried to the crow, "avaunt Blackamoor." (Spanish). One ass calls another ass long ears. (German.)

Scheming men plotting—'Ceitful fire roast plantain, cuncassa (soft soap) scrape it.

Youth mocking at Age—Man no done grow musn't laugh after long man.

A man who is so afraid of another man that he cannot say his soul is his own—Cow belongs to butcher, can neither say, "I berry well."

A boaster in a fix—Trubble ketch bull-dog, monkey breeches fit him.

Dog massa gib him money for buy bench, dog tek it buy bone, and say, Big Massa (the Creator) nebber ben mek him for sit down 'pon bench.

When black man tief, him tief "Quattie" (1½d.), but wheu Buck^ra tief, him tief whole a estate.

When fowl drink water, him liftup him hed say "tank God, tank God;" when man drink water, himsay nothing.

There is a comprehensive article on railway extension in South America, shewing wonderful progress already made in crossing high mountain ranges, from which we wish we had space to quote. But we cannot help quoting a description of labourers at the Diggings:—

We come now to the sinews of the camp, the labourer. He is never so happy as wheu he is grumbling, and that he is always ready to do. In the morning, the clock is fast; at night he accuses you of shifting the hands and declares that it is slow. He frequently assures you that he is devoted to your service. All he needs is a little encouragement, liberally interpreted, "grog." He is continually assuring you that if you can treat him well, that is, give him more than his allowance of food, he will indeed work for you. He abounds in honied words, commonly known as "sweet mouth" or "rattle," and at such times, beware! he is fooling you.

These remarks are intended to apply only to the creole labourer, who, after all, is the only one suited to this work. As to the others, the coolie and "Bill" are too liable to sickness, and the Chinaman is too smart. "country," *i. e.*, the Barbadian, is too delicate, and the Portuguese and Mulatto population are physically unable to do the work. Above all, in engaging labourers, beware of the "boots man!" On no consideration engage a man who seems at home in his boots, and, generally, look for the barefoot man. "Bill" generally gives out before his time is done. He takes his advance to his uncle, and comes into the bush utterly unprovided with clothing—sometimes without even a hammock. He has to subsist on food entirely different from that to which he has been accustomed, and the poor feeding alone renders him an easy prey to malaria and dysentery.

It is about his food that the ordinary labourer is most troublesome. He is perfectly aware of the amount of his allowance, and never wearies of telling you that he knows that, though you personally have nothing to do with it, the cook is robbing him. When told that under the circumstances it will be advisable to take his raw victuals and cook them, he will find numberless objections to such a course. Many make a regular practice of begging, giving one the disagreeable necessity of refusing. These few drawbacks excepted, they are a happy lot, and generally work well.

At night when their work is done, and particularly when there is a large gang, song after song is sung, and the chorus taken up in perfect harmony and unison. Certainly the songs are frequently mere repetitions and very meaningless, but in the still nights the singing is far from unpleasant, and appears to afford the performers infinite delight. The variety of the instruments is marvellous. Besides concertinas, flageolets, violins, guitars, etc., which they bring with them from town, they invent many more. They will rattle a spoon on a pudding pan very musically, they make use of the familiar comb and piece of thin paper, they whistle very fairly, they construct flutes with old bones, violins with meat cans, and wonderful to relate, they make even violoncellos.

There is a notice of a Carib-French Dictionary, which must be of special interest, as the race has almost disappeared. There is an interesting description of the Upper Demerara river in which we see it stated that a report on this region was made, a few years ago, by Mr. C. Barrington Brown. The snakes, fireflies and birds of this region seem to be equally beautiful and one bird the Hoatzin,—*Opisthocomus cristatus*, is so singular in its formation that it is called the reptilebird, just as the Australian kangaroo is regarded, from its structure, as the reptile animal.

BLIGHT ON TEA.

Tea has not hitherto, as far as we are aware, suffered from blight, which has been the destruction of coffee, but from all accounts it appears that it is liable to it. Messrs Jardine, Skinner & Co., of Calcutta, recently forwarded to the Agricultural Society of India some samples of tea leaves, concerning which the Manager of that Company's Gardens in Assam wrote:—"By sample post I send you a tin containing samples of tea leaves which are blighted by a sort of fungus. It seems to be spreading all over the gardens, and is not peculiar to low or high land. The leaves after a time get quite brown and black and fall off, leaving nothing but the stalks. It seems to be a new kind of blight. Could you find out from the Horticultural or Agricultural Societies what it is and what remedy would be of use?" The Company therefore asked the Society to examine the leaves, and give what information it could as to the species of blight from which the leaves were suffering. The samples, owing to their being packed in tin, arrived unfortunately quite spoilt for examination, but the Society stated that the disease appeared to be one which had recently been observed in more than one garden in Assam, and seemed to be very destructive. As the blight, or fungus, seems to be new to tea, it might be possible, it remarks, by collecting and collating all the existing information about it, to learn where and when it originated, and whether it appears to be associated with any particular surroundings, soil, age of plant, or other conditions; and the information might also afford some clue to the proper method of combatting it. Another correspondent wrote to the Society stating that the blight, or something like it, had long existed in some gardens in Assam without doing any appreciable injury. The proposed enquiry and analysis of the soils, &c. of tea plants might, in the opinion of the Society, throw some light on the subject, and we are glad to learn that steps have been taken to secure the services of a competent chemist to analyse tea plants, tea soils and manures and search generally into the cultivation and manufacture of tea. The inquiry once started will, says the Society, be the means of collecting and assigning to its proper place much of the information which different planters have acquired by experience, but which is not available to the rest of the community. The new tea blight referred to is a case in point. There has hitherto been no organised inquiry respecting tea cultivation and manufacture, and the departure now taken can hardly fail to benefit the industry.—*Madras Mail*, Aug. 27th.

BRICK TEA.

A curious and interesting feature of the Chinese tea trade in recent years is the extraordinary growth of the brick tea industry. Formerly the "Bods" of Thibet were the only customers for the compressed and sourish slabs that found their way across the frontiers to the Chinese dependency, but now the Tartars of Central Asia, the Siberians, and the peoples of Eastern Russia all demand their raw tea in the shape of slabs, tablets, or bricks. Consul Allen, in a report to the Foreign Office on the commerce of Hankow, recently stated that the trade in brick tea "seems to increase by leaps and bounds," so highly is the leaf in this form appreciated by the Russian and Siberian connoisseurs. The bricks are prepared by machinery latterly, and "the brick tea factories, with their tall chimneys, are the most striking buildings in the European settlement" at Hankow now. The museum at Kew Gardens received a couple of samples of this tablet tea early in the present year, and the number of the Kew *Bulletin* last issued, contains an interesting, though in some respects incomplete, reference to the subject of brick tea generally. There are two kinds of tablet tea manufactured for the Siberian and Russian markets at Hankow, the large and the small, but they differ both in manner of preparation and in the quality of the leaf used. The large bricks are made in a very simple way. A quantity of common tea dust is placed in a sort of pudding cloth or

bag, steamed for a few moments so as to cause it to adhere; it is then turned into wooden moulds, where it is beaten to the required consistency by means of wooden mallets.

In the modern steam manufactories of Hankow, the dry dust is poured into iron moulds and there subjected to "steaming" and pressure. This gives a better shaped and firmer brick, and as the Siberians set great value on the appearance of their tea-blocks, looking especially to the sharp cut of the corners and sides, the modern-made article is preferred to the old-fashioned hand-moulded slab. When ready, the bricks are placed on one side to cool, stored in drying rooms for a week, carefully wrapped in separate papers and packed in bamboo baskets, each containing 64. Each brick must weigh one catty—1¾ lb. that is—and great care must be exercised to secure the desired weight, or the Siberians and Tartars will refuse them. Hence, a brick, if underweight, is rejected and afterwards remade. Green tea is prepared in exactly the same way, only that the prejudices of the buyers require it to be made up into 2½ lb. tablets, to be made of the whole leaf and not the dust, and to be packed 36 in a basket. The cost of preparation, carriage, duty, and packing is about 30s per "picul" of 133 lb., or about 2½d per lb. Hence it can be sold at a very low price in the Siberian and Russian markets for which it is manufactured. The makers being practical business men, have due regard for the prejudices of their customers in favour of a brick of nice appearance, so they take care to reserve the finer and best quality dust for the outside facing, keeping the coarser and inferior leaf for the inside core. Some years ago this kind of brick tea was shipped to London in large quantities for despatch to Russia. At pre sent it all goes direct from China overland via Kiakhta and Maimachin.

The better class of Siberians and Mongols require a superior article, and to supply their wants a smaller brick or tablet of a good quality leaf is prepared. It is manufactured from the finest tea dust procurable from Ning-chow in Kiang-si, and Tsung-yang and Yanglutung in Hu-peh. The selection is carefully made, only the product of the early pickings or first crop being chosen. The fine leaf is not steamed for steaming has a serious drawback, inasmuch as it robs the tea of all its fragrance, and would therefore ill adapt the bricks for connoisseurs. The dust is poured into steel moulds, quite dry, and subjected to hydraulic pressure of about two tons on the square inch. In this way the tea is found to preserve for an indefinite period all its aroma and freshness. But not alone is the leaf used for the small tablets rather expensive, but the cost of manufacture is high owing to the care requisite for the proper preparation of the slabs. The original cost to the manufacturer at Hankow is over 84s per picul. Duty, carriage, packing, and so forth, will amount to at least as much in addition, so that the tablets can hardly be sold at a profit to the wholesale dealer and retailed at much under 4s per lb. With the best steam machinery the "failures" are over 5 per cent., where the old-fashioned hand moulds are used 25 per cent. of the bricks turned out are imperfect and have to be remade. It is claimed for the compressed tablets and bricks that the fragrant constituents of the leaf are better preserved than in the ordinary loose state, that the cells are broken by the heavy hydraulic pressure to which they are subjected, hence the use of the bricks is more economical, a given weight yielding a stronger infusion than the same quantity of loose tea. But though the small tablets have been introduced in this country, they have not taken with English tea drinkers.

The true brick tea of China, the unsophisticated native article, is, however, nothing like the tablets and slabs above mentioned which find their way to Russia and Siberia. The genuine brick tea of the Chinese manufacturers is that which is intended for the Thibetan market and for the Eastern Mongols. It is made of the whole leaf, stalk, flower, and all, as it is picked from the tea shrub, and is in shape and appearance not unlike a rather dirty ordinary brick. The correspondent writing in the *Kew Gardens Bulletin* states that he has never seen this kind of brick tea manufactured, but knows "it is made by Chinese in a very simple way." Simple is hardly the word to apply to the process of brick tea making adopted by the natives. Primitive is, perhaps, nearer the mark. The leaves are chewed, and when well saturated with saliva are laid out to ferment and partially dry. They are then rolled up into little balls, with the help of some additional moisture, and afterwards moulded by hand into oblong blocks or bricks about 10 in. long, 10 in. broad, and about 4 in. thick. The leaves thus prepared acquire a slightly sour taste, due to the fermentation induced by the saliva, which the Thibetans appear to like. The trade in these bricks is a most important one, and it is the fear of interference with it on the part of the tea-growers of Assam that is at the bottom of a good deal of the hostility manifested by the Chinese and Thibetans to an attempt to enter into closer commercial relations with the Trans-Himalayan State. The trade in brick tea is a strict monopoly of the Lamas or priestly caste of Thibet, and they are very jealous of any interference with what is to them a highly profitable business. The ordinary Thibetan must have tea; it is the one thing he considers indispensable, and cannot live without, and for this commodity he depends entirely upon the Lamas. The latter know that if intercourse between Darjeeling and Thibet were encouraged, the Assam planters could, and would, supply the natives with tea at a much lower rate than the priests charge. So what with the Lamas on the one hand, who fear to lose the monopoly they now enjoy, and the Chinese planters on the other side, who are afraid of losing the Thibetan market, it is not altogether surprising that the attempt to foster commercial intercourse between India and Bodyul is not viewed with favour on the other side of the Indo-Chinese frontier. Brick tea is also used as currency in Thibet, prices being quoted in equivalents of the compressed leaf. The beverage prepared from the sourish tablets is hardly likely to tempt the Western palate. The Thibetan teapot is a sort of wooden churn into which a boiling infusion of the tea-leaves is poured through a strainer; a little salt is added, and some 20 or 30 strokes are applied with a wooden dasher pierced with a number of holes. A lump or two of butter is then thrown in, and the mixture churned with 100 or 150 strokes "administered with much precision." But this is a good deal more palatable to Europeans than the brew concocted of the bricks by the neighbouring Mongols. Meal, as well as a bountiful supply of butter, is added to the decoction, and with a fat sheep's tail or two swimming about in the liquid, a dish of tea is served out which, in flavour and appearance, it is difficult to distinguish from well-thickened pea-soup.—*Morning Post.*

PERAK AS A FIELD FOR PLANTING ENTERPRIZE.

We have pleasure in giving publicity to the following extracts from a letter addressed by the Superintendent. Government Plantations, Perak, to a European firm in Penang:—

"A short report on the soil and climate of Perak, and on the suitablity of the country for tea and other tropical products, is the best answer I can make to the last para of your letter.

...A glance at the map of the Malay Peninsula and Archipelago will show, better than words of mine can describe, how admirably Perak is situated. It is practically in the same latitude with, and may be said to be the centre of, the richest Spanish, Dutch, and English Colonies, which have been famous for centuries.

In most parts of the country—more particularly the Perak Valley (a magnificent tract of land of vast extent), the Kinta and Batang Padang Valleys, the Valley of the Slim and the country stretching from the British Province Wellesley to Taipeng, embracing the Krian and Selama districts—the soil is a deep rich loam, and in places where limestone mountains crop up, is truly unrivalled for productiveness.

Rainfall and Temperature.—Official returns give the *mean* rainfall at seven stations, occupying cent

positions in the valleys and districts mentioned, as 111·8 inches for the year 1888. Highest rainfall 171·89 inches, lowest rainfall 82·18 inches. The mean temperature at six stations for 1888 is 81°·3.

To practical men comment on these returns is superfluous. The rainfall, varying as it does, leaves the choice open to them of fields suitable to the various products: tobacco, coffee, cocoa, tea, or the different spices—nutmegs, cloves, cardamoms, pepper, &c.; while the temperature forces a growth which will tax the best soil and utmost skill of the planter to keep up with.

Labor.—It is not necessary to proclaim the virtues of the Tamil cooly as a laborer. Suffice it to say the lowest wages fixed by law are 14 and 16 cents for a male laborer, 12 and 10 cents for a female laborer, rates for food being fixed likewise. The loss on recruiting is trifling compared to what other countries less favourably situated have to suffer.

Facilities for Transport.—Perak is rougbly estimated as 120 miles long by 90 miles broad. Steamers call daily at Port Weld and Telick Anson the Northern and Southern ports of this limited area. The rivers Krian and Bernama, at the extreme North and South of the country, has been, and is being, traversed by railways, canals, macadamised cart-roads, and six foot bridle tracks, in a way which would be marvellous in a less progressive age, and under a less able and energetic administeration, guided as it is by a far-seeing policy.

All that is necessary for the rapid development of the agricultural wealth of this State is that Perak should be known to Capitalists at home."—Local "Times."

THE TOBACCO PLANT.

Tho London *Journal of the Society of Arts*, January 3, noting that the tobacco plant "is grown and employed as a narcotic in almost every country in the world," and that about "one-fourth of the human family use it," adds:

"It is somewhat difficult to obtain trustworthy information regarding the world's trade in tobacco, because so much is used up locally in different countries. It is probable that the total area under tobacco is not far short of 6,000,000 acres. For the year 1886 certain official returns are available, which show that the Unitod States, India and Hungary are the largest producers. The area under tobacco in acres was in

United States............	752,520	Algeria..........	20,478
India..........................	641,000	Italy.............	12,061
Hungary and Austria.	149,468	Holland..	3,218
Germany.....................	49,312		———
France.........................	37,156	Total acres...	2,106,213

"The consumption of tobacco in tho United Kingdom is large and progressive, and the revenue derived from it last year was nearly £8,750,000. The average consumption is largest in Holland—nearly 7 pounds per head; in the United States about 4½ pounds; in Hungary, Denmark, Belgium and Germany from 3 to 3¾ pounds. In the Australian colonies it is also high—3½ pounds; in France it is about 2 pounds, and in the United Kingdom under 1½ pounds.

The yearly production of tobacco in Cuba is about 300,000 bales, and 181,000,000 cigars are also exported. Tho Spaniards have hitherto monopolized the trade in cigars, alleging that parts of the soil of Cuba were alone suited to the production of Havana tobacco. This assertion is now disproved, for with good choice of seed, soil and leaf, and skilled manufacture, Jamaica is said now to send into the market as excellent a cigar as was ever shipped from Havana, and at a far cheaper rate. In the Philippines 100,000 cwt. of tobacco are produced. The Dutch possessions in the Eastern Archipelago ship a large quantity of excellent tobacco, which is held in high repute in Europe. The imports of Sumatra tobacco in Holland now average 140,000 bales, and of Java tobacco 130,000 bales.

"Although there are about fifty species of the genus *Nicotiana* known, only three or four are much cultivated for the leaf. The two principal commercial forms are by some botanists treated as varieties, and not as distinct species * * * Madras, where the climate is admirably suited for the growth of tobacco, stands first with regard to the development of this industry in India. Dinnigul is the great tobacco district, and cheroots are manufactured at Trichinopoli. The islands in the delta of the Godavery also yield what is called lunk tobacco, the climate being suitable, and the plants are raised in rather poor light soil, highly manured and well watered. No better evidence could be afforded of the universal use of this plant than the extensive display which was made of it in every section of the Paris Exhibition."—*Bradstreet's.*

AMHERSTIA NOBILIS.

It is now fifty years since this magnificent plant was introduced from India into England. Its fame had become known from a description by Dr. Wallich, who found it in 1827 in Martaban, growing along with *Jonesia Asoca*, another splendid-flowered leguminous tree. Writing of the Amherstia, Wallich said: "The largest of the two trees I found was forty feet high, with a girth of six feet near the base. Both were profusely ornamented with pendulous racemes of large vermilion-colored blossoms forming superb objects, unequaled in the flora of tho East Indies, and I presume, not surpassed in magnificence and elegance in any part of the world." Many futile attempts had been made to introduce this plant into English gardens before the Duke of Devonshire sent a collector specially for it, and succeeded in importing and establishing a plant in the famous Chatsworth Gardens. This plant is still alive. But the Duke was not the first to flower the Amherstia, a small plant in the collection of Lady Lawrence, at Ealing, flowering first in 1884. The first raceme that developed was sent to the Queen, and the second to Kew for figuring in the *Botanical Magazine*. A plant now in the Kew collection—originally, I believe, a cutting from the Ealing specimen—has produced a few flowers on several occasions within the last ten years, and it is in bloom now. The racemes, five in number, are pendulous, two to three feet long, and bearing from fifteen to thirty flowers, each of which has a drooping pedicel six inches long, bearing a pair of large wing-like bracts four inches from its base, the flower being four inches across, and composed of four spreading sepals, five unequal petals, three of them large, and in the position usually occupied by the standard in the flower of an ordinary Legume. The stamens are united at the base, and form a long curved tube. The color of the whole flower, bracts, pedicel and all is the richest vermilion or vivid scarlet, with blotches of rich lemon-yellow and a faint bluish tinge on the standard-like petals. In habit and foliage the plant resembles Brownea or jonesia. The temperature supposed to be essential to this plant is from seventy to eighty degrees, with a bottom heat of ninety degrees, but the Kew plant is growing in a house devoted principally to Aroids and Tree-ferns, along with the largest of which it is planted out in an unheated but well-drained bed of soil. The temperature maintained in this house in winter is sixty-five degrees in severe weather, whilst in summer it rangos from seventy to eighty-five degrees. This is precisely what one keeps an ordinary stove at. Evidently, therefore, Amherstia may be grown and flowered in any house devoted to tropical plants. The Kew specimen is about ten feet high.—*Garden and Forest.*

MINOR PRODUCTS IN CHINA.

As an illustration of the value of some of the so-called "Minor products" in tropical countries, I may point to the fact that ground nut cakes—that is the residue or mace after the expression of the oil from the seeds of Arachis hypogæa—is exported from Kiungchow in China, to the extent of over 1,000 tons annually. In 1888, there was exported from this port

1,301 tons, of the value of £7,205, but in 1889 the quantity fell to 1,044 tons, valued at £5,780. In commenting on this, the British Consul says that the crop has been bad all over the island, so that a considerable amount has been imported for consumption from the mainland, whereas a surplus for exportation is generally looked for. The cultivation of this crop has given way considerably of late years to sugar, and whereas the oil expressed was formerly sufficient both for the cooking and lighting purposes of the district, it is not now sufficient for cooking alone, and the price which was formerly about 5c. per lb. is now three times that sum. Sesamum (Sesamum indicum), is also largely grown, but the seeds showed a decrease in value of nearly £7,000 during 1889. The crop was an unusually good one owing to dry weather, and the diminished export of the seeds is due to the fact that they have been used for expressing oil to make up for the deficiency in ground nut oil.

Betel-nuts (Areca catechu), seem to be another important article of export from Kiungchow, the quantity exported in 1889, amounting to 648 tons of the value of 18,333. Betel-nuts are stated to be an article both for export and import, there being a considerable demand for Betel-nuts grown in this island, as they are of superior quality, and fetch double, or more than double, the price of those imported from the Straits. These letter are, it is said, imported to be mixed with the native product, and fraudulently passed off as the genuine article.—J. R. J.—*Gardeners' Chronicle.*

PERAK SUGAR CULTIVATION COMPANY, LIMITED.

The fifth annual general meeting of shareholders in the Perak Sugar Cultivation Co., Limited, was held on Wednesday, 26th March, 1890, at the Shanghai Club. There were present:—Messrs. R. Francis (Chairman), C. J. Dudgeon (Secretary), G. H. Wheeler, A. J. How, Douglas Jones, J. Buchanan, E. Hey, S. Walker and Pow Kee, representing in all 1,303 shares and 380 votes.

The Chairman, after stating that he presided in the absence of the Chairman of the Company, said:—For reasons stated in the report it will be proposed, at the conclusion of the few remarks which I have to make, that this meeting stand adjourned until June. It is probable also that in 1890 June will be found a convenient date for the meeting but as the area of canes to be cropped in the early part of the year increases, so will the date of the meeting have to be thrown back, until, with the estate in full cultivation, it will probably be August to September before a full report of the campaign can be presented. With regard to the crop for 1889, full particulars are given in the report. The weight of sugar produced per orlong, and the proportion of No. 1 sugar have both been better than in any previous year of the Company's working. It has been somewhat unfortunate that, owing to short supply of labour, the area cropped in the twelve months has fallen short of the estimate, and consequently the accounts as made up to 31st Dec. show a less favourable result than was anticipated; it is, however, of course to be remembered that the 130 orlongs short cropped in 1889 merely fall into the area to be cropped in the early months of 1890, and thus shorten the non-productive period of the present year, so that the estate suffers little or nothing at all. Labour has been a matter of considerable anxiety to the manager and directors. The increasing industries of the Straits, and the large demand for Indian labour in Ceylon, have caused a demand for labour in excess of the supply. The directors can only say that the matter is one which engages the most careful attention both of themselves, their manager and the agents in Penang. The crop for the season 1890-91 is described by the manager as the "best and largest we have had"; the crop is looking excellently well, and the only anxiety regarding it is the matter of labour already referred to. With regard to the accounts, if the proposal for adjournment is agreed to, these will be supplemented for the meeting to be held in June, and, though at the present time there is considerable extraordinary expenditure in manuring for the coming crop, there seems no reason to fear that the estimate of a profit of Tls. 14,000 on the campaign will be disappointed. In addition to this sum it is to be remembered that the company will have paid over Tls. 10,000 in interest on borrowed capital. The Tls. 14,000 that we anticipate, and the Tls. 10,000 amounting to Tls. 24,000, will give about 8 per cent. interest on the capital, and as this is for 16 months, that will be 6 per cent for the year.

Mr. How asked if the shareholders were to understand that they might look for a dividend of 6 per cent.

Mr. Dudgeon said they were not allowed to pay a dividend of more than 4 per cent. until the debentures were paid off.

Mr. How thought the sugar account was a somewhat bald statement, and he suggested that the number of orlongs cropped should be given as also particulars of the different grades of sugar and average prices. It would be of interest to the shareholders to be enabled to follow the prsoperity of the Company by means of such particulars. He asked if the contemplated expenditure on a new boiler was for an entirely new one in addition to the plant in use at the present time, or was it to take the place of one which was out of order.

Mr. Dudgeon said a new boiler might be required to take the place of one of the present ones, which had recently suffered some damage; and it was considered necessary to have a second one on the spot. The rapid deterioration of the boilers was due to the impurity of water used. The expense of a new boiler and mill roller was estimated at £500. The area cropped and averages of No. 1 and No. 2 sugar were given in the report.

Mr. How said the report only gave the gross amounts. The average prices of each grade should be given, so as to form a guide in future years.

The Chairman said Mr. How's suggestion would be brought before the Board of Directors. He (the Chairman) saw no reason why it should not be carried out.

Mr. Douglas Jones—I suppose the Board do not like to prophesy as to the length of time it will take before the shareholders are likely to get anything out of the company?

The Chairman—I think it desirable not to prophesy.

Mr. How—Unless you know.

The Chairman—If our anticipation of a net return of Tls. 14,000 is carried out, it would enable a small dividend to be paid. It must be remembered that the whole estate is not being worked; but next year or the year after, it may be expected to be in full cultivation.

It was then moved by the Chairman, seconded by Mr. Wheeler, and agreed to, "That this meeting stand adjourned until Wednesday, 25th June." The proceedings then closed with the usual compliment to the Chairman.

Report.

The directors, as required by the articles of association, submit their report for the year 1889. The working of the Company, however, shows that the holding of the annual meeting in March, with accounts made up to 31st December (a date almost in the middle of the crop) is entirely inconvenient, and renders it almost impossible to lay before the shareholders a proper statement of the Company's position. It will therefore be proposed at the forthcoming meeting to adjourn until June, when, the crop having been cleared off, it will be possible to submit a report with accounts, closed to 30th April, showing the actual results of the previous campaign. It will also be proposed to fix a date for the meeting in the following year which will cover the campaign of 1890-91.

Crop.—The area cropped during 1889 has given most satisfactory results both as to weight of sugar produced per orlong and as to quality. The production per orlong averages piculs 38 as against piculs 31 in the previous year, and the proportion of No. 1 sugar is 76 per cent. against 65 per cent. In price, too

the estate has been fortunate, the average obtained being $5.75 per picul as against $4.80 in 1888. Owing however, to a great scarcity in the supply of labour it has been found impossible within the 12 months to take a crop from the whole area of 615 orlongs, which it was stated in last report represented the crop for 1889; in addition to this the manager considered it advisable, in the future interests of the estate, to throw back the autumn cropping a month, so as to bring the cultivation more in accordance with the recognised rules of sugar planting in the Straits. Owing to these causes the area cropped has only been 484 orlongs, the short fall of 130 orlongs being left over to be cropped during the early part of the present year.

Estate Extension.—Owing to the labour difficulties already alluded to, it has only been found possible to add 35 orlongs to the cultivation during 1889. The area in cultivation is now 694 orlongs, of which it is estimated that 650 to 675 orlongs will be planted with cane for the 1890-91 crop.

Capital Works.—With the exception of the small addition to the estate above-mentioned, and some necessary additions to the coolie lines, there has been no important expenditure under this heading. It is however in contemplation to replace the present launch and sugar boat, with a larger launch which will combine the work of both. The estate is even now too large for the existing transport arrangements.

Plant.—The mill has done its work well during the year. The boilers need repair, and this will be attended to when the present crop is worked off; it has been necessary to work the boilers at reduced pressure for the past three months, which forms another reason for the short cropping in 1889. It may be necessary to supply a new boiler and a spare mill roller during the year, the estimated cost of which is $3,500. Otherwise the whole of the plant is in good order. The additions to plant during the year have it will be seen been written off, for the most part, to depreciation

Accounts.—These, to 31st December, show a profit of Tls. 7,113.10, in addition to which it is to be noted the Company has paid Tls. 7,512.07, in interest, a charge principally made up by the 15 per cent interest payable on debentures. These two amounts together make a total of Tls. 14,625.17, which represents the actual earnings during the year over and above the expenditure necessary for the working of the property or say nearly 6 per cent on the present capital. If the sums borrowed are added to capital, as they probably will be hereafter, the percentage of earnings is over 4½ per cent, which it is to be remembered is from a crop of only 484 orlongs. These figures, however, do not convey an accurate impression of the actual position, for on the closing of the campaign, with a crop taken from further 252 orlongs, it may confidently be anticipated that the present apparent profit on working account will be at least doubled. For the adjourned meeting a complete statement of accounts will be prepared and issued to shareholders which will show the actual results of the campaign. With regard to the debentures it is be noted that the first batch falls due in December 1891, when it is hoped that they may be replaced by a new issue of capital, or by a loan on very much easier terms.

Director.—Mr. E. G. Low retires in rotation as required by the articles of association but offers himself for re-election.

Auditor.—The re-election of Mr. G. R. Wingrove as the Company's auditor requires the shareholder's confirmation.

W. V. DRUMMOND, *Chairman.*

CHAS. J. DUDGEON, *Secretary.*

—*N. C. Herald.*

BETEL LEAVES OIL, A POWERFUL BACTERIA POISON.

Such is the purport of a paragraph in the American *Grocer*:—

At the Naturforscher meeting in 1888, says the *Pharmaceutical Journal*, Professor Eykman reported that among the constituents of the essential oil distilled from fresh betel leaves he had found a characteristic compound, having the odor of the leaves and the constitution of parallyl-phenol, which he designated "chavicol." About the same time Messrs. Schimmel announced that the phenol present in the higher boiling fractions of the oil distilled from air dried betel leaves corresponded completely with eugenol, though subsequently they made the modified statement that the phenol obtained by them was not eugenol but an isomer. With a view to clearing up the apparent contradiction, Professor Eykman has re-examined the oil distilled by himself from the fresh leaves and some distilled from dry leaves by Messrs. Schimmel, with the result of confirming the presence in the former of chavicol, boiling at 236° to 238° C., and in the latter of the isomer of eugenol, boiling at 254° to 255°, which proved to be orthomethoxy-chavicol (*Berichte*). It would seem probable, therefore, that both phenols occur in the leaves, and that chavicol being the more volatile had practically disappeared from the dried leaves, while the method of distillation adopted by Messrs. Schimmel favored the more complete removal of the higher boiling compound. Some experiments made with chavicol are said to have shown it to be a powerful antiseptic, it being five times stronger as a bacteria poison than carbolic acid and twice as strong as eugenol.—*Oil, Paint and Drug Reporter.*

TEA DUST.

To the Editor of the "Home and Colonial Mail"

Sir,—May I ask space in your paper to draw attention to a considerable source of annoyance and expense which tea dealers experience when dealing in tea dust. Whether it is that the ancient art of making tea chests has been lost, or that the material of which they are fashioned is now of a more brittle nature than formerly, the fact remains that scarcely any carrier will take delivery of a chest of dust unless the package is cased in canvas to prevent leakage. The reason assigned by the carrier is that the packages will not hold in their contents, and hence a claim for loss in transit is a certainty unless the aforesaid precaution is taken. The cost of casing and cording is very nearly ⅛d per lb., and as the country buyer, in almost every instance, refuses to bear it, contending that the seller should deliver his goods in merchantable condition, the loss falls on the wholesale dealer, and it is out of his power to recover it from the importer. It may be contended that the dock company is paid by the importer a consolidated rate, which is supposed to cover everything, and hence to deliver the packages in good condition. But the warehouse keepers are also accustomed to canvas tea for the dealers, and as they make a profit on the operation they are interested in the system which renders casing necessary. The carriers are also engaged in the same business, and the consequence is that when a carman appears at the tea warehouse to take delivery of a lot of tea, and the delivery foreman calls out "It is dust," there is an immediate halt in the proceedings. The carman drives off without the tea, and sends to the wholesale dealer the following notice of "stop." "We find these packages contain dust, so we cannot take delivery unless they are cased." The dealer may insist on delivering the tea as it is, but in that case the carrier declines to give a binding receipt, and thus secures himself against claims for loss in transit. This state of affairs has been on the increase for years past, and makes it impossible to deal in tea dust without constant annoyance and expense. The wholesale dealers naturally admit the force of the country buyers' contention that it is incumbent on the seller to provide a merchantable package for his goods. It is now time that planters would look to this matter. It is no part of my present design to advocate the use of anybody's patent metal cistern or *papier mâché* casket, although I decidedly think those packages will answer the purpose of holding dusty tea far better than the ordinary lead lined wooden chest. All I wish to say is that the package in which tea dust is sold ought to be fit to hold it in till it reaches its destination. Planters

might easily ensure this by a little more care in selecting strong chests for their dust teas. If, however, they continue to neglect it, they may, perhaps, find that buyers in this market will give dust teas less attention in the days to come.—I am, &c. D. F. SHILLINGTON.

[If, as we have seen it stated, 150 lb of dust are sometimes crammed into a single chest, we cannot wonder if such chest gives way.—ED. *T. A.*]

THE JAVA COFFEE CROP.—The Amsterdam correspondent of the *London and China Express* writes under date Aug. 13th:—The reports regarding the Java coffee crop for this year continue to be very unsatisfactory, for the Government as well as for the private planters. There are districts in which the crop will not be more than 10 per cent. of the quantity harvested in the past year.

PEPPER &C. IN PERAK.—A report from Kuala Kangsa district states:—

The cultivation of pepper is not making so much progress as might be wished, owing to the want of capital, and the difficulty in procuring plants. There are still a number of applicants, principally Achinese, for pepper land, but the majority of these people are only able to take up from one to three acres each, and they are very often unable to bring even one acre under cultivation, unless they can obtain advances. Kong Lin, however, is making good progress with his estate. He has cleared thirty acres of land in addition to the original clearing of ten acres, which is now almost planted up; but he, also, has experienced difficulty in obtaining pepper cuttings, and informs me that about 50 per cent of those sent over from Penang are not worth planting. He is now clearing ten acres of land near his pepper estate, which he intends planting with orange trees from Kelantan. The fruit of these trees, he informs me, is superior to any produced in the Straits, and commands a ready sale. I have not lately been able to visit the pepper estate at Pasir Panjang, but Syed Musa informs me that it is progressing favourably, and is now partly in bearing. He has about 20,000 dedap cuttings for sale, and can also supply a few pepper plants.—*Perak Government Gazette.*

THE PEARL FISHERIES of Mexico are about to be prosecuted with greater energy, and the Government has just granted a concession for fifteen years to Senor Quaglia for the exclusive right to fish for pearls in the Gulf of California and off the coasts of Lower California. Hitherto the average annual value of Mexican pearls sent to Europe has been about 80,000 piastres, and of mother-of-pearl about 25,000 piastres. The divers (mostly Sonora Indians) are remunerated according to results, and there is a wide margin between the prices fetched on the spot and those obtained in Europe; for instance, a pearl which is bought in La Paz for 500 dollars will fetch about 25,000 francs in Paris. Mother-of-pearl shells, again, which may be bought in La Paz at from 8 to 12 centavos per pound, are worth three times as much in Europe. Mexican pearls take the next place after the Indian for beauty; they are mostly small and irregular in shape, but very hard, and of exceptional brilliancy. In the year 1881 a pearl was found weighing 28 carats, and this fetched 90,000 francs in Paris in 1883, again one of the divers brought up two pearls weighing together 76 carats. Mexican pearls are mostly white, and these are of less value than the brown, black, or pink the latter being the rarest. The finest specimen has been set in the Spanish Royal crown; it weighs 100 carats, and although it dates from the 17th century, it still preserves its ancient brilliancy. The pearl fishery is a very lucrative business in Mexico; the oyster shells brought up sell at the rate of 10 to 12 piastres per 100 kilogrammes, which of itself is sufficient to cover all expenses, everything else being clear profit.—*Times of India*, Aug. 15th.

THE MONGOOSE IN JAMAICA, introduced to destroy rats on sugar estates, has largely effected this object, but unfortunately "this strange bird" as Mr. Whymper called it, did not confine his attention to rats, but has been so destructive in the fowl yards and otherwise that a commission has been appointed to decide the question whether these Indian representatives of the ferret and weazel are not more mischievous than useful and whether they ought not to be exterminated and how.

"CARAVAN TEA."—"Miss Mantalini," writing in the *Pall Mall Budget* of 31st July on various delicacies to be had at Morel's in Regent Street, London, says:—

"Talking about tea, Morel's manager told me he had many customers for 12s 6d tea. This tea isn't packed, and its qualities are that it is weak and scented. The taste for this tea is acquired; it wouldn't suit the general English palate, which likes something rough. It is well known that Russians take all the best of the China teas."

No doubt the wealthy idiots who pay 12s 6d a lb. for "weak and scented" Chinese trash consider good wholesome Ceylon and Indian tea far too vulgar for their delicate palates. We hope that their number is not large.

USES OF THE COTTON PLANT.—Two more have recently been added to the many uses of the cotton plant. A report comes from Germany that a process has been discovered by which sugar is extracted from cotton seed meal. It is said to be very much sweeter than cane sugar but having a peculiar fermenting quality cannot be so generally used. For some purposes however it will be greatly preferred to the ordinary product. The other use is that of making felt from the lint which clings to the seed after it has gone through the "gin." This cloth, it is claimed, will come into wide use for hats, etc, as the process is inexpensive and the material has hitherto been counted waste! What a feature of these modern days is this utilization of so called "waste!" Material that like the cotton seed were but yesterday considered a nuisance and some that were a menace to public health are today by the touch of chemistry and mechanical ingenuity transformed to articles of use and beauty. It surely looks as though those were right who claim that there need be no waste and there will be none when men come to understand nature's forces better. —*Indian Agriculturist*, Aug. 16th.

A NEW INDIAN INDUSTRY.—The Pioneer Glass Manufacturing Co., Limited, has recently been formed in Calcutta to munufacture glassware from indigenous materials, which, it has been found exist in abundance in Bengal and with which experiments on a large scale have already been made by a leading London glass factory. The first experiments were made in the presence of Mr. James Watson (well-known in Calcutta as the inventer of the hydraulic press now in use here) and Mr. Malcolm, of Messrs. May Malcolm & Co., of London, and these, as well as subsequent trials of the Indian materials, proved their suitability for the making of all classes of glassware in use in this country, including window glass. The Company has for the present been formed on a comparatively small scale, but it is intended that the work should be extended in due course. The cost of manufacturing glass articles here is estimated at from forty to sixty per cent, less than in Europe. The Company has secured the services of a highly qualified English expert as manager, and suitable land and buildings have been secured in the neighbourhood of Calcutta.—*Indian Agriculturist.*

THE FUEL QUESTION IN CEYLON.

With reference to the very natural desire of the Uva planters to see the planting of patanas with timber trees on a large scale, reference may be made to Col. Clarke's remarks on the heavy expense of afforesting or re-afforesting processes. We can speak from personal experience of the cost of obtaining seeds which perhaps do not germinate or when they germinate are destroyed by insect or fungoid pests. Plants put out are also too often killed by unfavourable weather, and then, when the planting is successful, there is the long waiting for returns. Nevertheless, tea planters ought to plant trees. One who deserves to be listened to writes to us:—" This is a most important question for the Forest Officers who have to keep up the railway supply, and are looked to to meet the wants of the planting community. The Government will doubtless do all it can, but the planters must look to their own resources. I know an estate on which the other day I strongly advised the planting of the available patana and waste spaces with teas, but the gentleman charged with looking after the interests of the estate *opened the remainder in tea*. I suppose to get a little money for the present, Planters upcountry ought to keep at least 25 per cent of their land in forest if they desire to making their own tea. Damba, the tree you mention as being liked on high estates, belongs to a family very numerous in this country,* almost all of which yield excellent building timber. Wa, as you say, is esteemed by the railway; but, I apprehend, it was only mentioned by Mr. Strong owing to its foliage and flowers standing out so prominently on the land bordering the Railway. There are *many many* other woods equally good for fuel with *wa*, which, indeed, is too good for fuel, being quite a cabinet wood." This agrees with what we heard about beautiful articles of furniture being made from an old *wa* tree (*Cassia siamea*, or *C. florida*) at Negombo. The timber is hard and beautifully mottled.

A VISIT TO THE COLOMBO CIGAR FACTORY.

(From a Correspondent.)

I recently paid a short visit to the Ceylon Tobacco Manufacturing Company's premises at Messrs. Cumberbatch & Co.'s mills in Vauxhall Street, and was much interested in what I saw. The cigar factory is an upstair building, formerly a coffee store. Upon reaching the top of the stairs a busy scene was observed, men, women and children all actively engaged, each one at his or her own special task in the making of a cigar. First were a number of men stripping the ribs out of the tobacco, all seated in line on the floor. Then came a lot of women cutting it up and piling it in heaps ready for the packers. These were mostly boys, who are very expert in gathering up a handful, arranging it and quickly seizing a leaf rough wrapper, he places one end between his toes (not a very agreeable sight for those who smoke the cigars), stretches the leaf, and holding it by his right hand he rolls it into a sort of ship shape, which concludes his work. It is then passed to another who places it in a mould, which is put under a screw press. The mould holds about 15 cigars, and they are pressed in shape, and have to remain in the mould till partly dry. They are then taken out and another wrapper of the finest tobacco, which is imported in boxes and bales from Sumatra and Borneo, is put on. The cigars, after passing through all the hands who have to do with manufacturing them, are passed on to another part of the room where they are packed into boxes, after having been tied into bundles with a pretty yellow silk ribbon.

The boxes are all labeled "The Ceylon Tobacco Manufacturing Company, Limited," and passed downstairs into the drying-room, which is built airtight, with an iron hot-air tube about 18 inches wide running through the centre of it. The thermometer usually registers more than 100 degrees in the room, so that the cigars are soon dry, and ready to be exported. The market usually chosen is Australia, where there is a ready and profitable sale for them. In the drying-room a lot of bricks are used to place on the top of the boxes to keep them from warping. There is also a room where the tobacco is steeped in vats, and placed on a sloping cement platform to drain off the water. This must be done before it can be worked with.

The manager of the factory, Mr. Boyd, has great trouble with the coolies, who are very much addicted to chucking up their billets after they have been taught the art of manufacturing cigars, so that he has to teach fresh hands almost daily. There are about 60 hands in the factory at present, but they sometimes exceed 100.

There is plenty of coarse tobacco in the country to be got cheap, which would do very well for manufacturing cavendish, and I don't see why it should not be tried; there is plenty of sale locally for good black cavendish. The manager says that the ribs taken out of the leaves are all wasted here, whereas they are used up at home for snuff-making, but the heavy duty on tobacco at home prevents its being sent to the London market. Why not start a snuff factory as well? I am sure the natives here are large consumers of snuff, which is all imported, I presume, at present. I love a good cigar, and I must say I have smoked some of the finest to be had in the East, and they were turned out of the Ceylon Tobacco Manufacturing Company, Limited.

COFFEE IN GUATEMALA.

Coffee is the principal staple commodity of the Republic of Guatemala, and its chief article of export. The topographical features of the country are such that climatic influences are favourable to the growth of the berry, varying only according to altitude and care in cultivation, or as the degree of tropical heat may be tempered by copious rainfall, and precautions as to shade during the early age of the tree. The United States Consul at Guatemala says that in cultivating coffee, a nursery is formed by the choice of a level piece of virgin ground, in proximity to water, where the earth is rich. The land must be thoroughly cleared, and the soil dug to the depth of at least nine inches, and made as friable as possible. It is then divided into beds, with narrow paths between. The seed, carefully selected from the soundest grains, either in parchment or with their outer husk, should be sown, row by row, about ten to twelve inches apart. A rope, the length of the beds, stretched from one end of the same to the other, is used for this purpose. The seed, if sown in suitable weather (April being the best month,) makes its appearance in the tender blade above the surface after thirty-five to forty days; so that a nursery formed during the month of April of one year has plants sufficiently matured to be set out during May or June of the following year. Preliminary to the all-important progressive step in coffee culture, that of transplanting, is "holing." The field is prepared in advance for the reception of the nursery trees by digging holes (five yards apart when above 3,000 feet above the sea,

* The *Eugenias* are referred to.—Ed. *T. A.*

and three yards when at the lower level of from 2,000 to 1,000 feet above the sea) to depths of about twelve inches by twelve inches in width. It has been demonstrated, by frequent experiment, that leaving the holes open for three or four months is chemically beneficial to the soil. In the matter of transplanting, the actual placing of the infant trees into the holes prepared for their reception is one that requires the most care and attention of all the operations in the formation of a coffee plantation. Early planting, during the month of May, June, and July, is desirable because the tree have the benefit of the entire rainy season, and are sure to give a larger maiden crop. Coffee trees usually bear abundantly one year and lightly the next. Judicious pruning helps to increase the crops, although no definite rule can be given for pruning old trees further than that no branch should be allowed to yield more than three crops. The average product per acre in Guatemala of coffee cultivation is 1,800 lb. In the preparation for market, the berries are always picked by hand and carried to the curing house, where the pulp is removed by machinery and placed in a water-tank, where the bean is never allowed to remain beyond a period of twenty-four hours. After the saccharine scum which covers the bean is washed off, the contents of the tank are turned out upon large drying grounds of cement, called *patios*, upon which the coffee beans are thinly spread. It is important that the coffee shall be constantly turned until all the surface is dry, and the beans cease to adhere to each other, while care is taken not to break the parchment whilst exposed to wind or sun, as every hour's exposure to the atmosphere, after removal of the parchment husk, takes away both the colour and aroma of the bean. When the beans are thoroughly dried and hulled, the sorting operation commences. Generally "firsts," "seconds," and "thirds" are prepared for packing into Dundee or Calcutta sacks of 130 to 135 lb. net each, and upon its completion the coffee is ready for transportation on the backs of Indians or mules, or in carts drawn by oxen, to the nearest railway station for the most convenient port of shipment. The largest bulk of the "firsts" finds its way to London, the "seconds" to Germany and France, and the "thirds" to the United States. The labour on the coffee plantations is performed by the Indians of the country, whose remuneration varies from 19 to 25 cents in Guatemalan currency. The Indians subsit on *tortillas*, a corn cake and *frijoles*, the bean of the country, both corn and bean being grown by their own labour on patches of ground on the squatter system, which belong to either the owners of the estates where they are employed, or are unsold Government lands which are thus gratuitously appropriated.—*Journal of the Society of Arts.*

SCIENTIFIC GOSSIP

on the kola and areka nuts, on tea, camphor and other substances, as given in the Melbourne *Leader* is interesting. It is specially important to learn that tea grown under shade, so as to be partially blanched, possesses nearly one-third more theine than tea grown in the open. It is, however, startling to learn that theine is a poison! We quote as follows:—

The Kola nut of South America and the areca, better known as the betel, nut of India have had much attention paid to them of late, because there is a disposition on the part of Europeans to give them a trial on the supposition that the South Americans and Indians must have really derived advantage from the virtues they are supposed to possess. The Germans have resolved to give the Kola nut to their soldiers when on service in a campaign, because it is at once a food and a stimulant, containing within a small space more nutriment and more capacity for maintaining strength than any other condiment. The consumption of this nut may have its drawbacks, but they have yet to be found out, and the experiment is at least worthy of being made. The nut contains a large proportion of theine and of theobromine, so that it is at least probable that it has some sustaining properties, although these are probably exaggerated. The chocolates sold as sweetmeats may have similar properties, and we may hear of their being added to the commissariat of the French army, so that the virtues of the two stimulants may be tested in future warlike encounters. The Indian areca nut is regularly eaten every day in the year by 100,000,000 of the population. There is an annual importation of upwards of 30,000,000 lb. from Ceylon, the Straits Settlements and Sumatra, and they are exported in considerable quantities for the use of Indians living in Zanzibar, Mauritius, Aden, China and other countries. The fresh nuts have intoxicating properties and produce giddiness. These objectionable properties are much diminished by heat and by drying, and many cautious people decline to use any except those nuts which have undergone a process of cooking and are known by their color. The original wild nut was intoxicating, but the only nuts now used are from cultivated trees, and these are milder. They are only intoxicating when unripe, and then but slightly. The nuts are eaten with the betel leaf, the praise of which is sung in the ancient books of the Hindoos, which attribute to it no less than 13 valuable properties which are duly enumerated. Modern medical men vouch for the fact that the essential oils of betel leaves are highly beneficial in catarrhal affections and throat inflammations. Further researches into the properties of the nut and leaves are evidently called for, because their preparation by native methods are a good deal regulated by superstitions. The betel leaves are mixed with other spices and with lime to form *pan*, with which the nuts are eaten. An organic poison can be extracted from the nut, and when this is injected under the skin of rabbits and cats they die in a few minutes: but the same may be said of a great many other vegetable productions, the Kola nut inclusive, which are usually regarded as harmless. Even the lettuce contains such a poison. The arecanut grows on a palm which is supposed to have been indigenous in the Malayan Peninsula and Islands, but is not now found in a wild state. The Indians no doubt indulge too freely in the use of the arecanut and betel leaves but for exceptional use they may be found to be medicinally beneficial. If the reverse be the case, further investigation is demanded on behalf of the 100,000,000 betel eaters.

The finest tea, in oriental estimation, is gathered from shrubs which have been kept shaded for three weeks, so that the leaves are partly etiolated or blanched. It is called "flat tea," because the leaves are not rolled; they are merely steamed, and are never touched by the hand but turned over by the aid of a bamboo stick. After steaming they are merely dried. There is nothing in this process to justify the high price demanded for the tea. A Japanese chemist, Y. Kozai, assistant in the Agricultural Chemical Laboratory, has analysed this tea and found that it contains 30 per cent. more theine than the tea made from leaves grown in the sun. The work done by the chemist appears to be reliable. He analysed the natural leaf and the same manufactured into black and green tea. The chief difference he found was in the quantity of tannin, which was large in the natural leaf and in the green tea, but very much smaller in the black tea. He maintains that there is nothing injurious in faced tea, the Prussian blue being only 1000th part of the weight; but he is severe in his condemnation of the practice of mixing with the tea the leaves of other plants which

contain tannin but no theine, although he admits that none of them are injurious to health. He supplies some hints about the making of tea which have at least novelty to recommend them. The very fine teas are ground to powder, and this is infused in water not much more than lukewarm, the temperature ranging from 120 to 150 Fahrenheit. Medium quality tea is infused for one minute only in water at the boiling point, while inferior black tea requires to be absolutely boiled. What tea drinkers want is a combination of quality with cheapness, and this should not be unattainable.

Theine is a rank poison, but it does not follow that tea, coffee, cocoa, maté, and many other kinds of foliage and fruit are fatal to life or even in any marked degree injurious to health. In like manner prussic acid kills instantaneously, and yet bitter almonds and apple-pips may be eaten with impunity. Vegetable poisons may, as a rule, be taken in small doses, not only without much risk, but medicinally, with advantage. It need not, therefore, be looked upon as surprising that the Americans have made the discovery that strychnine lozenges may be taken without any immediate lethal consequences. It is contended that a lozenge containing the 13th of a grain of the alkaloid serves as a tonic, bracing the system and banishing languor. But who says so? Any eminent physician? No. Somebody has said so, and rumor keeps up the fallacy. The practice is dangerous, and should be discountenanced. The habit of taking strychnine lozenges may become confirmed, and may lead to a craving for larger doses, as opium eating does. Not only is strychnine poisonous, but so also is the plant from which it is extracted. Daturin is an allied alkaloid, and medical men not infrequently advise patients suffering from asthma to smoke the stalks of the thorn apple or datura stramonium, but it may be questioned whether the alkaloid is not destroyed during the combustion. The strychnine lozenge is a more serious affair, and its consumption has its analogue in tobacco chewing, although no one has yet taken to the use of nicotine lozenges. Those who take drugs of this kind, in any form, unless in obedience to the orders of their medical advisers, are not deserving of sympathy when their indiscretion leads to suffering.

There is a scarcity of camphor in Europe, and it has gone up enormously in price, which has advanced from 1s to 3s 6d per lb. The explanation given is that camphor is used in large quantities in the manufacture of smokeless gunpowder. It is just as likely that a camphor ring has been formed, and that large quantities of the drug may be stored somewhere awaiting a further rise. In the meantime a Paris physician recommends it as a specific in cholera—a very old idea which may have little but its age to recommend it. —Melbourne *Leader*, Aug. 2nd.

SELLING QUININE FOR FUTURE DELIVERY.

For some weeks past there has been a revival, on a rather modest scale, of the speculation in quinine, which at irregular intervals lends a temporary flicker of excitement to the dealings in that unfortunate product. In spite of the oftrepeated lessons of former years, it seems that there are still persons sanguine enough to believe that a good thing is to be made by investing money in quinine. There are never wanting intermediaries who with an eye to brokerage, are ready to prove with the aid of statistics that the market *must* soon take a turn for the better, and that if facts hitherto have unfortunately failed to agree with their predictions, so much the worse is it for the facts. Any spasmodic revival of speculation brings grist to the mill of the brokers who are manipulating the purchases on behalf of investors, and the kernel of whose philosophy may be considered to lie in the axiom *après moi le déluge.* Outsiders have been drawn into the stream by relying on the slender knowledge displayed in certain "financial" jonrnal which have permitted the columns to be used for the furtherance of some operators' veiws. The communication which we print on another page of this issue from an Amsterdam cinchona broker of standing may be studied to some advantage by people who are always ready to allow themselves to be drawn by the infallible statistic system. Our correspondent propounds the theory that the quinine price cannot permanently advance so long as one or two "speculative" manufacturers are able to depress it to their own immediate adva'age, and with complete impunity so far as they themselves are concerned, by a simple but efficient system of contracting with the Java planters to supply them direct with their bark at a price to be dependent on the basis of the quinine unit existing at the time when the bark shall be delivered. The planter thereby saves auction expenses, brokerage and warehouse charges; he knows that, come what may, he is sure to be able to dispose of the whole of his produce at the market price of the day; and preferring modest certainty to capricious chance, he delivers himself into the hands of the speculative manufacturer. Now what is the position of the latter? He has to face a keen competition, and can only keep his head above water by either forming a "combination" with his rivals, or elbowing them out. "Combination" has been tried and found wanting, and the other alternative is therefore being pursued with vigour. The manufacturers' mode of procedure is sketched as follows: Having made his contract with the planter, and knowing that he can depend with certainty upon a supply of bark equal to, say 300,000 oz. of quinine in the course of the season, he proceeds to attract buyers by offering quinine at an exceptionally low figure, to be delivered, say in four or five months' time. Being the lowest in price, he secures orders, and his rivals, who have to buy their material mostly at the public sales, are bound either to follow suit, handicapped by the want of a certain cheap supply of cinchona in the future, or to give up the competition and trust to the established reputation of their brands for the preservation of certain channels of consumption. When delivery of the quinine is due, the "speculative" manufactnrer is in possession of the cinchona from his Java planters, and as he pays them upon the basis of the quinine unit ruling at the time of delivery—which, in a period of abundant supply, he is able to influence towards depression by underselling his competitors in advance—he is sure to make a profit, small may be, but absolutely certain, the Java man paying the piper. The names of the clever operators referred to will occur at once to anyone familiar with the London drug market. As a matter of fact there are and have been for a long period, only two or three so-called "speculative" quinine makers. The others have ceased to "compete" seriously in the "future delivery" business, and are waiting for the time when the system, which must natutally be a hazardous one, shall be relinquished. In confirmation of our correspondent's theory, for which we disclaim any responsibility ourselves, but which is certainly an ingenious one, we may point to two items which were published in our journal about a year ago. At a meeting of the Soekaboemi Agricultural Association of Java (to which most of the cinchona planters of the island belong) held early last year, a letter was read from Messrs. Zimmer & Co., of Frankfort-on-the-Main, expressing a desire to enter into negotiations with Java cinchona growers for the purchase of their entire production of bark outright, to save charges. At the annual meeting of shareholders in the Soekanegara Company held in Amsterdam last June, it was announced that the whole of the cinchona produced on that company's plantations had been consigned to the Brunswick Quinine Works at an average price (for 1888) of about 10¼d per oz. for its equivalent of quinine sul-

phate. The Soekanegara plantations produced in 1888 104,000 kilos. bark, equal to 4,680 kilos. quinine; in 1889 132,000 kilos. bark, equal to 5,610 kilos. quinine; and their estimated crop of 1890 is 100,000 kilos. bark, expected to yield 4,500 kilos. quinine. They rank among the three or four largest private plantations in Java.—*Chemist and Druggist*, Aug. 16th.

GOLD IN MADAGASCAR.

The discovery of gold in large quantities in the great African island of Madagascar just at the moment when Europe is turning for fresh fields of enterprise to the dark continent, is an event of more than local importance. Silver has long been known to be a pretty whispered mineral in the island. But hitherto the Hovas Government has discountenanced any attempt on the part of adventurers from Europe to exploit the island inquest of precious metals. With the establishment of the French protectorate a few years ago the country has been to some extent opened up to foreigners. Already a "gold rush" on a small scale has commenced to the island, the adventurers hailing from the French West Indian Colonies and the Hovas are beginning to see that it is impossible to keep white men out of the country, once the existence of the fatal metal becomes known. Possibly the Malagasies will share the fate of the Australian aborigines and the Maoris within our time and the output of gold from the once most exclusive island will begin to exercise an appreciable effort upon the world's store of the precious metals. But the climate of Madagascar, which is not favourable to Europeans may save it for a time. The country is one eminently adapted for mining industries, labour is cheap, and the gold-bearing reefs are not far from the coast. Indeed the metal appears to be pretty generally distributed all over the island though it is found in greater quantities along the west coast. Already a good many speculators are buying up likely land in the island and an influx of miners from America, Australia and South Africa is expected to commence.—*Indian Agriculturist*, Aug. 23rd.

TEA IN JAPAN.—The *Japan Weekly Mail* of Aug. 16th says:—"Nothing new in tea; sales and prices about the same as for the last few weeks, though fully five and a half million pounds more have been shipped this season than last year at same date." The *Mail* in its issue of Aug. 22nd says:—"The tea trade is steady, and values are unaltered. The receipts of leaf here are already 5,000 piculs more than the total last season, and there is doubtless a good deal more to come in if present rates are maintained."

ODESSA is doing a large and increasing trade in China tea. In the month ending the 15th July, seven tea-freighted steamers were timed to arrive at the Russian port, five of which belong to the Volunteer Fleet, the other two being specially chartered English vessels. The tea freight is chiefly destined for Moscow and St. Petersburg houses, the consignors in those cities having engaged three hundred waggons on the South-Western Railway for transport. A correspondent thinks, however, that the prospect of the Chinese tea trade is on the whole anything but encouraging for the Chinese themselves. "For some time to come Russia will probably continue to be a chief buyer of Chinese teas, but the amount of her purchases will gradually diminish with the rapid propagation and development of the new tea plantations in Russian Central Asia." The writer adds that undoubted preference is now being manifested alike in England, the British colonies, and the United States for Indian and Ceylon teas.—*Indian Agriculturist*, Aug. 23rd.

THE WORDS FOR SUGAR IN DIFFERENT LANGUAGES are quoted by the *Sugar Cane*, in a review of an elaborate work on sugar by a Dr. Lippmann. We quote the curious paragraph:—

In the next section, that entitled "Sugar at the time of the Crusades," is an interesting dissertation, founded on the studies of Littré, Diez, Grimm and others, on the word sugar in various European tongues.

From the original Indian form *çarkara*, which in Prakrit became *sukkara* (the habit being to drop the letter r before a consonant, and replace it by reduplication of the following consonant) was formed the Arabic *sukkar*. This word naturally became the parent of all the different forms such as—azucar (Spanish, from alsukkar, pronounced assukkar), assukar (Portuguese), zucchero (Italian), chuchre (Provençal), chucre (old French), sucre (French), zukura (old German) zucker (German), zocker (Flemish), suyker (Dutch) sokkar (Swedish), syker (old Norse), sukker (Danish) sachar (Russian), cukier (Polish), cukorus (Lithuanian), cukra (Bohemian), czukor (Hungarian), shicker (Mongol), shakara (Tibetan), shakar (Persian), shachara and shukar (Armenian) sheker (Turkish). The middle Latin contained as many as 28 forms, varying from chuchra to sachara, zockra, zaccarum, and zukurum, the last agreeing most nearly with the usual Latin form saccharum.

ELEPHANTS AND IVORY IN AFRICA.—From reminiscences of Equatorial Africa, which are appearing in the *Pioneer*, we quote a sad passage:—

We also came across traces of the wild elephant during this march, the spoor being quite fresh, and the broad track they had made for themselves proved the herd to have been a very large one. There was a freshly beaten path through the jungle, with the saplings bent and twisted down, branches of trees torn off and denuded of their foliage, and an occasional uprooted bush lying about the track, looking as though a battery of heavy guns had been forcibly dragged through the place, cutting up the soil into deep ruts and damaging the trees by its transit. That the herd could only have passed but a very short time before was evident; but we followed up the path for some distance we failed to get a glimpse of them. The natives have a very barbarous method of killing these huge animals which they described to us with great gusto, evidently considering it to be very ingenious and not seeing anything cruel in it. They did not dare to face them in the open, but used to carefully mark out the spots near the river where the elephants were accustomed to come to drink. Selecting some tall tree overhanging the path, they would conceal themselves among its thick foliage for days together in the hope of seeing the huge beasts pass underneath their hiding place. The weapons they employed were very heavy barbed spears, having long pliant shafts attached to them, and these they hurled with great force upon the elephant below. The animal immediately dashed off at a tremendous pace through the jungle as soon as he felt the wound of the spear. The long handle kept striking against boughs or catching in thickets, making the terrified animal still more mad with pain and fright, and causing the iron barb to inflict a wider gash. The cruelty of this plan was not merely in the self-inflicted agony of the moving barb, but in the length of time that generally elapsed before the poor beast would slowly sink from exhaustion and loss of blood. They told us that they had followed up the track for as many as four days before coming up with the wounded elephant; and the horrors of its death seem (as they vividly described it to us), with a circle of tormentors hurling their spears from a respectful distance until its carcase resembled a huge pincushion, were enough to make one look on ivory with mingled feelings ever afterwards. Yet one could not blame those savage hunters, for, as they themselves said: "We have no big guns such as you possess, and one would much rather kill them quickly than slowly." It is to be hoped for the poor elephants' sake that they may soon possess the needed rifles, for as the competition among the East African Companies will increase the demand for tusks, and for every other saleable commodity those forests can produce, the probabilities are that the native hunters will have a busier time of it than ever. How long the ivory will hold out is another question.

LUPINS AS BINDERS AND REGENERATORS OF SANDY SOIL.—There is an interesting paragraph on this subject quoted from the *Madras Mail*. The only question is would lupins thrive at sea level in the tropics. Von Mueller describes the white lupin as common to countries on the Mediterranean Sea, *also in the orient*. Of *Lupinus arboreus*, which is referred to California, he writes :—

This has been used there for reclamation of sand, on account of its long tap-roots, the latter having been traced to a depth of 25 feet, while the stems were only 8 feet high. The germination is easy and the growth rapid on the sand-downs. For aiding the young lupines during the first two months, to get hold of the sand, barley is sown with them, as the latter sprouts in a few days and holds the sand in the second week; the lupine subsequently covers the sand with a dense vegetation in less than a year.

And of the lupin specially referred to, *Lupinus luteus*,

The Scented Yellow Lupine. Countries in the vicinity of the Mediterranean Sea. Can be grown in Norway to lat. 70° (Schuebeler). This annual species is predominantly in use as green manure through Middle Europe; to improve sandy soil, it is the best of all yet tested, and will do even on coast-drifts. It can also be employed like some other lupines as a fodder-herb, green as well as for hay; some lupines are also very valuable as pasture-herbs. Lupine-seeds are very fattening, when used as an addition to ordinary fodder, and are in this respect quite equal to oil-cake, while the foliage is said to be not inferior to that of clover and more bulky. Nevertheless some lupines have proved poisonous to sheep. About 90 lb. of seeds are required for an acre. Langethal observes: "What the Sainfoin does for the poorest-limestone or marly soil, that the Yellow Lupine carries out for sand-land." Lupines are not adapted for wet or moory ground, nor for limestone formations, where most other leguminous fodderplants do well. Mr. Joseph Augustin speaks of a yellow-flowering lupine, which sometimes in the Azores attains a height of 12 feet in three months.

Plants native to California ought to succeed fairly in Ceylon.

AGRICULTURE IN JAVA is thus noticed by a writer in the *Pioneer*:—"The hamlets look like green islets in a sea of golden rice. Immediately outside the ring fence which has been described commences the rice or other cultivation. Not a square yard of ground seems to be wasted, and the care and evident labour with which each bit of slope is terraced and supported, the greatest area thus being obtained for the rice crop, is most admirable. These terraces are carried up the sides of the highest mountains, the mighty volcanoes themselves allowing the cultivation to creep up within what looks a dangerous distance from their craters. The water for irrigating the crops is brought from the hillsides and is unfailing. This enables the cultivator to get two rice crops off the same field, and this staple appears on the village lands in the month of April, in all stages of growth from sowing to harvest. The main crops are rice, Indian corn, beans, sugarcane (eight kinds), coffee, pepper, indigo and tobacco. During the past three years a blight has affected the sugarcane, stunting the growth and seriously diminishing the outturn. This has been a severe blow to the factories. Rice is still an article of export, so that, in spite of the enormous increase of the population, which now is said to reach twenty millions as against five millions in Raffles' time, the island more than feeds itself. The cocoa tree, with its beautiful blossoms and fruit, both on the tree at the same time, is to be found in many of the peasants' gardens, and the cocoanut and the sugar palms abound. All the Indian fruits are to be seen in the bazaars, together with the dorian and the mangosteen."

TREES IN WESTERN AUSTRALIA.—The following is from a "Naturalist," Mr. A. J. Campbell, F.L.S., writing about Western Australia in the *Australasian* :—

Leaving Perth midday on the 30th December—a sultry day—we proceed through open timber and scrubby country. Christmas trees, in golden bloom arrayed, lift their heads above the "stinkwood" scrub. There are Banksias great and small and heathy patches where sheoaks and grass trees give figures to the landscape. I never look at a sheoak (but why "she" when half the trees are males?) without thinking of its far-fetched, although euphonious, botanical name. *Casuarina* (*Casuarius*) signifies the cassowary, a large bird, whose hairy-like plumage is the equivalent of the more perfect feathers in other birds; and it has been thought that the wiry foliage of the sheoak stands in like relation to the better-formed leaves of other trees.* The general nature of the soil is sandy, but dark and loamy, especially where twisted white-bark ti-tree stems stand out in bold relief. Passing Guildford, eight miles from the capital, some fine orchards are seen in the stiffer reddish soil. Figs almost grow wild here, judging by the large trees bearing prolific crops. Now we are winding among the ironstone spurs of the Darling Ranges. Having crossed that natural barrier and descended into the level country, we leave the rough-barked jarrah and smooth silvery barrels of the wando in the rear, and York gums with rough dark-grey stems, commence to assert themselves. The cultivated soil grows good wheat; yet strange to say, although the population of Western Australia is only 43,000—exactly one-tenth that of Melbourne—energy is lacking to raise sufficient grain for local wants. At 8 a.m. we leave Beverley, and are soon speeding south over the West Australian Land Company's section—242 miles of railway, with its 3,000,000 acres. This is undoubtedly the largest land syndicate in Australia. There is plenty of open acacia scrub around. "The land of the acacia" would indeed fitly apply to Western Australia, because out of 300 Australian species about two-thirds have been recorded for this territory. The most conspicuous is *Acacia acuminata*, vulgarly called raspberry jam wood, for when its dark-brown timber is worked a scent is given off exactly like that of the well-known preserve. One of these trees at a distance resembles a balloon without a car, having a crown of narrow light-coloured leaves, supported by numerous long stems branching from near the ground. At a wayside station, I examine one of the stems and find it a perfect conservatory for lichens. One piece of bark only 6in. × 2in., which I subsequently submitted to a lichenologist, supported no less than eight varieties. Many of the jam-wood trees, which are about 10ft to 20 ft. high, bear the mistletoes. On reliable authority I learn that the sweet little swallow Dicæum feeds on the mistletoe berries when they are in season, as this bird does in every other part of Australia. From the jam-wood, which is very durable, blackfellows manufacture their wommeras and boomerangs, while a dwarf tough mallee, which they call "marluck," is suitable for slender spears. Now and again we get a glimpse of the pendulent foliage of a small sandalwood tree (*Santalum cygnorum*) All the marketable specimens seem to have been cut except on the back block from whence they are carted to the different railway stations where their wood of delightful fragrance may be seen in great heaps. It is valued at about £8 per ton. During 1888 £33,595 worth was exported to China, where it is used solely to burn as incense before idols. I understand a company is about to distil oil from the wood, as santal oil is frequently used for medicinal purposes as well as for blending in the manufacture of perfumes. The sandal-wood tree closely resembles the quandong of Victoria.

* Absurd as "sheoak" is (the grevillea is called silk oak), the term "beef wood" is still worse. In driving Mr. Henniker Heaton and a party of friends along the fine avenue of casuarinas which leads to the Lunatic Asylum, that was the term we heard applied by the Australian colonists to this graceful pine-like tree.—ED. *T. A.*

PETROLEUM AND OTHER LIQUID FUELS FOR USE IN THE WORKING OF STEAM ENGINES.

We have always taken a great interest in the question of utilizing petroleum as a source of steam production in engines and, also, if that should be found possible by the repression of the odour as fuel for drying furnaces in tea factories. We have written often and quoted largely on the subject, and latterly we have been waiting for more light on the question before noticing some important papers with which we have been furnished, in order that we might deal with them. We are disappointed that a reliable authority to whom we sent a paper on the Priestman oil engine should return it with the statement that he had not seen a Priestman's oil engine or heard any definite particulars about its working; but he has promised to make inquiries and communicate the result. Meantime he writes —"If what the makers say about it is correct, it is just the thing we want for estates with no fire-wood left." As our readers are aware, this is the only oil engine which has yet been put to the test of actual trial in Ceylon, and it has been favourably reported on. The serious questions here in Ceylon of course, will be the cost of the oil and the quantity required per horse-power. We have always felt that the prospect of a large use of petroleum in Ceylon, for engines or furnaces, depended on the possibility of using the waste or refuse product resulting from the refining of the crude oils. To admit of the import of such waste substance, we suppose the Ordinance No. 6 of 1887 would require to be amended, for by that Ordinance petroleum is held to be dangerous when the flashing point is below 76 of Fahrenheit's thermometer. We cannot doubt that means could be devised, by chemical treatment or mixture with other substances, whereby waste petroleum could be rendered safe (the danger of explosion and contaminating odour being equally obviated), and the prospect is that we need not be dependent on America or Russia for this class of engine fuel. It has been found and is being constantly discovered in various parts of India and Burma and is used in locomotives on the Indian State railways. Meantime, with reference to our Ceylon standard of safety, it is curious to find in the description of the Priestman engine the statement that there can be no danger, because "oil can be used, having 800 specific gravity and upwards, with flashing point from 75deg. (1deg. below our safe point) to 150deg." But we suppose 75deg. as flashing point is safe enough, because our Petroleum Ordinance provides

"That when all or any of the petroleum on board a ship or in the possession of a dealer is declared by the master of the ship or the consignee of the cargo, or by the dealer, as the case may be, to be of one uniform quality, the petroleum shall not be deemed to be dangerous if the samples selected from the petroleum have their flashing points, on an average, at not less than seventy-six degrees of Fahrenheit's thermometer, and if no one sample has its flashing point below seventy-three degrees of that thermometer."

As to cost of petroleum and kinds of oil or fuel which can be used, the paper on Priestman's engine states:

"Oil used is about 1.25 pints per actual h.p. per hour for the larger, and about 1.6 pints for the smaller engines with full load. Mineral oil can be purchased in England at about 6½d per gallon, costing from 1d to 1¼d per actual h.p. per hour. Any ordinary mineral oil suitable. Royal Daylight, Russian, Orient, Tearose, King's County, Water White, White Camelia, Pipe Line, Scotch Paraffin, Prime White, American Fuel, &c."

We suppose that the quotation "1d. to 1¼d per actual horse power per hour" for petroleum oil would have to be increased by at least 50 per cent for Ceylon, say 1½d to 1¾d, or say to 2d per h. p. per hour. If crude oil or waste product could be used, the cost would, of course, be less. It is claimed for the engine that it is perfectly safe, because "Oil and not spirit is used." Amongst the merits claimed for this engine are:—"No gas, *no steam*, (?) no danger, no chimney, few working parts, no extra insurance, piston self lubricating, quickly started, no coal, no boiler, no fire, *no driver*, (?) no water consumed, repairs very small, little space required, works anywhere." And then as to mode of working:—

"The working of the Priestman Oil Engine is so simple that an unskilled person can give all the attention it requires. The motive power is obtained from Mineral oil, one or two days' supply being placed in a closed iron vessel inside the foundation of the engine. The oil having been mixed with air under pressure, is drawn into the cylinder and ignited by an electric spark from a small ordinary battery supplied with the engine. To start the engine, after heating the vaporizer a few minutes, it is only necessary to admit a small quantity of oil into the cylinder by taking a turn or two of the fly-wheel. Little or no attention is required in working the engine, and there is no risk in leaving it unattended, as, should the oil become exhausted, the engine will then only cease to run. Detailed working instructions are sent with every engine."

There are certificates from such scientists as Sir Wm. Thomson, and testimonials from persons who have used the engines for widely differing purposes, one gentleman stating "In a place like mine where water is scarce, and a high pressure engine unsuitable, your engine is indispensable." The prices seem fairly moderate, but these the local agent can supply. We may, however, quote a note to the effect that

"These prices include, besides the engine, all the plant required for creating oil vapour, making the user entirely independent of boiler or gas works. There is little or no expense in fixing these engines, as they are self-contained."

So far in regard to Priestman's engine, in which oil only is used. But we have also before us a paper on

"Holden's Patent System" of using liquid fuel as auxiliary to solid fuel in the fireboxes of locomotives or boilers of similar type.

The advantages here are that a mixture of fuels, or a particular fuel alone, can be used according to circumstances, the calorific value of coal or wood being apparently greatly increased by a mixture of "green oil," (?) or coal gas tar. We quote as follows:—

"By this system, liquid fuel and air are introduced into the firebox above a thin layer of solid incandescent fuel by means of a special injector, and burnt in combination with the solid fuel, without any alteration of the firebox, other than the insertion of one or more tubes through the casings, the boiler so fitted being equally suitable for the use of ordinary fuel. The use of this method results in efficient combustion, entire absence of smoke, intense and regular heat, and great economy of fuel. Slack, inferior coal, lignite, cinders, wood, peat, or sawdust may with equally good results be used as solid fuel. The air necessary for combustion, not having to be introduced through the fire, a very small amount of draught is required, and in the case of locomotives the orifice of the blast pipe may advantageously be enlarged from 50 to 60 per cent, reducing the wear and tear of the firebox, tubes, smokebox, and chimney, preventing the emission of sparks and ashes, and conducing to economic and efficient working by the diminution of back pressure.

From a description of the patent in *Engineering*, we learn that

"The first experiments of Mr. Holden on liquid fuel burning were made at the Stratford works of the Great Eastern Railway Company on a boiler in the

department where oil gas is manufactured for lighting trains. At these gas works one of the products is a tar which it is difficult to dispose of at any price, but this is now burnt under the boiler, which was fitted with the liquid fuel apparatus early in 1886. The boiler is a small one of the Cornish multitubular type, 10 ft long by 4ft. in diameter, with a furnace 7 ft. long by 3 ft. in diameter, from which 122 iron tubes 1¾ in. in diameter by 3 ft. long extend to the back of the boiler. The boiler is worked at 60 lb. pressure, and when coal was used the consumption per week (79 hours in steam) averaged 68 cwt. 1 qr. 16 lb. or 97.1 lb. per hour. With the liquid fuel apparatus the consumption per week, with 69 hours in steam has averaged 454½ gallons of tar and 2 cwt. of coal, or an average per hour of 65.9 lb. of tar and 3.3 lb of coal."

The question is whether the tar referred to, as "difficult to dispose of at any price," could not be imported and used here more economically than petroleum, or coal, or coke? In the case of a printing office boiler

A comparison of the cost of working with coal only in 1887, and with coal and liquid fuel during the present year [1888] (the comparison being made for a week in each case), gives the following result:

Coal only Used.

1887. Consumption during one week from August 15th to 20th (inclusive), 74½ hours' work, including lighting up=80½cwt.=121·3 lb. per hour.

Cost for 100 hours=12,130 lb. of coal at 11s per ton =2*l*. 19s 7½d.

Coal, Coke, and Tar—"Holden's System."

1888. Consumption during one week from June 25th to 30th (inclusive), 87¾ hours' working including lighting up

=coal 15 cwt.	=19·2 lb. per hour	
=coke 11½ ,,	=14·7 ,,	,,
Gas tar 280 galls.	=35·1 ,,	,,
Total ..	.. 69·0 ,,	,,

Cost for 100 hours

	s.	d.
=1920 lb. of coal at 11s 0d per ton=	9	5¼
=1470 ,, ,, coke ,, 9s 6d ,, =	6	1½
=3510 ,, ,, tar ,, 12s 6d ,, =	19	7¼
Total £1	15	2

Again:—

Various kinds of liquid fuel have been used, and the apparatus appears capable of dealing with any of the ordinary marketable qualities. On the occasion of our making a trip on the engine there was being burnt a mixture of one-third "green" oil with two-thirds tar, and this was burnt entirely without smoke or trouble of any kind. Roughly speaking the consumption of fuel on the engine above referred to is one gallon (or 11 lb.) of liquid fuel (a mixture of two-thirds ordinary gas tar and one-third creosote or furnace oil) to about 14 lb. of coal per mile.

Engineering, in summing up, states:—

"It will be seen from the facts we have stated above, that Mr. Holden's system of using liquid fuel is one of very great promise, and it appears to us of especial value for use in cases where it is of importance to be able to at once revert to burning coal alone, as may occur in consequence of fluctuations in the market price of oil or other circumstances."

Whether the Priestman engine is adopted or not, our readers will see that great benefits can be derived from a mixture of liquid with solid fuel in furnaces.

As might have been anticipated, Messrs. Marshall of Gainsborough, so well known as the manufacturers of tea machinery, have not failed to lay themselves out to meet the demand for appliances wherewith to burn petroleum as engine fuel. In papers with which we have been furnished we find the following notice:—

"Petroleum as fuel in locomotive and Vertical steam boilers. In many parts of Ceylon, India, &c., where coal and wood are scarce or costly, we beg to draw the attention of Planters and others to Petroleum and other mineral oils for use as fuel in the Boilers of our Steam Engines. We can supply the necessary Apparatus and Fittings, which can readily be attached to our Locomotive and Vertical Boilers, for using this class of fuel, and they can quickly be removed and the Furnace used for burning wood or coal if required. The apparatus is simple and efficient, and we shall be happy to furnish full particulars and prices on application."

In reply to a Firm who had written to them on the subject, it was stated:—

"In reply to the last paragraph of your letter *re* Petroleum burning we have supplied an arrangement for this purpose to a number of Locomotive Boilers from time to time, and we see no difficulty in its application to Boilers of the Vertical type also. We give you at foot, prices of the necessary plant in connection with existing Boilers.

"This would consist of a tank to hold the oil-coil to heat the same from the exhaust steam—the necessary injector and pipe—and also the firebrick material for the inside of the firebox. The refractory material for the grate we do not supply, as of course anything of an imperishable nature would suffice for this, road material or any kind of clinker that is available would do very well for this purpose.

"With regard to the quantity of oil consumed so much depends upon the kind of oil used, but we may explain that in our experiments at the works we used about 3 pounds (3 pounds) of oil per indicated horse-power per hour, that is about one-third of a gallon.

"From the above explanation your Managers will readily be able to ascertain the quantity used per day, as each will have an idea what indicated power his engine is giving off, and will then readily be able to calculate from the above what quantity of oil it would consume. Our experiments here were conducted with what is called "Refuse Oil" but if the oil is of better quality the consumption would be less.

"Cost of Petroleum Burning apparatus to existing Boilers including oil tank and coil, injector and piping, firebrick lining for firebox.

6 H-p. £20 10 H-p. £24
8 H-p. £22 12 H-p. £26. Subject to usual terms."

Our readers will thus see that they can, if destitute of an engine and requiring one, obtain a Priestman engine for the consumption of oil alone; or engines in use can be supplied with the needful apparatus for the consumption of petroleum; or finally they can get increased heat with increased economy by using as fuel a mixture of liquid and solid substances having calorific properties. The curious point in the whole matter is that even Messrs. Marshall, who ought to know much about the delicate character of tea and its absorbing qualities, express no apprehension and suggest no caution as to prevention of petroleum odour coming in contact with the tea in the store. We suppose the danger has been calculated and thoroughly provided against.

PLANTING IN WYNAAD.

Aug. 27th.

After two months, during which hardly a single day passed without a considerable rainfall, we are now enjoying a delightful break in the weather. This was very greatly needed, as the constant damp not only checked growth, but it did an infinity of mischief to the coffee by rotting the leaves and, worse still, the berries. This is really a case of adding insult to injury, for surely our crops need no diminishing and it is cruel work to see the very little we have falling from the trees. I am sorry to have but a bad report to give you anent leaf disease and borer, both of which are simply ravaging the estates all round. The appearance of some of our finest properties is shocking, and so severe an outbreak of both these terrible epidemics, must seriously affect the trees. Possibly under such circumstances, the fact of little or no crop may be an advantage, as the coffee has one less drain on its enfeebled constitu-

tion. But I believe a discouraging view is held generally of the future of Arabica, and this is sufficiently proved by the large and steadily increasing demand for Liberian seed. In fact, the time has evidently come for planters to depend no longer on the old broken reed. Arabica will give crops in perfectly new clearings, if heavily manured, for a few years, just long enough to allow its sturdier relative to come into bearing, but we can never hope to see those clearings healthy fields fifteen years hence, as we should have done in the good old times. The species is so thoroughly and hopelessly impregnated with leaf disease, that it is impossible for it ever to be eradicated, so nothing apparently remains for us but to bury our old friend, and regard him only as a fragrant memory. It is thought that Liberian has a fair chance, and this, as I said before, is being largely planted throughout our district. Pepper is the next hope. So far, this gives every promise of growing well, and we are assured that though at present, the prices are depressed, there is a prospect of a good rise before long. This year the vines do not appear to be fruiting as well as usual; this is probably due to the weather. But the plants themselves look exceedingly healthy, and are growing very fast. There can be no doubt about the suitability of our climate for tea. That which has already been planted grows splendidly, and at considerable profit. The great difficulty—and this a serious one, is the labour. A tea—unlike a coffee plantation, must have labour all the year round and it is especially needed during those months when our coolies are accustomed to return to their country. It is a decidedly unhealthy time in Wynaad and this being well known, makes another difficulty in procuring permanent labour. The labour question, even with regard to ordinary cultivation, is becoming a worrying one to us all. This year having no crops to pick, it will not so much affect us. But should next blossoming season be successful, and our labour be as failing as it has been this year, I don't know what will have to be done. Considerable losses have been incurred by the vile and apparently unalterable system of advances. The coolies do not now take the trouble to invent excuses for their absence; and they even in some cases send out scouts to view the land, and if the report is, "plenty of weeds,—bad crops and no chance of present at the end of the season," they remain at home happy in their minds that they have secured a good advance, and need not fash themselves to work it off. Cinchona is another trouble. We know quite as well as anyone can tell us, that at this elevation, high cultivation is absolutely necessary for the well-being of cinchona. Where we have planted it with coffee thereby enabling it to benefit by the manure, our fields look healthy enough. The hitch is that it is impossible for us in these exceptionally hard times, to cultivate cinchona *by itself*, as it requires. A rise in the price of bark would enable us to go in for high cultivation, but at the present market rates, it is barely remunerative without any cultivation at all.

Verily, "these be parlous times," the planters' burdens are pretty heavy all round. The rise in exchange which makes so many fathers of families rejoice, is to us as dust and ashes, and means a woeful decrease in our already attenuated incomes. And here, comes in another pinch. The subject being our taxation.

By the old arrangement planters were called on to pay R2 per acre on all coffee or cinchona which was of ago to give a return—*i. e*—3 years old; and if at any time a field or coffee was found unremunerative it could be abandoned; and Government claimed no more of it. Unfortunately, for all who have middle aged or old properties, the case is quite different; since the settlement introduced by Mr. Castle Stuart, two years ago. Our assessment was then fixed, once and for all; and whether the coffee is since dead or not our dues must be paid, or the whole property will be sold up. An owner of 300 acres, let us say, of old coffee, may find now that only fifty acres of this can pay its expenses, and let the other 250 go back into jungle. But he will have to pay R600, a year in tax on his 50 acres, or failing that lose his little all. Government will put his whole property up to auction, if he does not pay sharp, and probably buy it in itself for a few rupees. In fact, the greater part of Wynaad is being so bought up by Government; on account of arrears of taxes owed by natives and I am told on good authority, that batches of 60 and 70 holdings, are sold off every month, Government in most cases buying them in. Needless to say, this is causing much suffering amongst the small cultivators, whose little all, and sole means of maintenance depended upon their minature estates.

It is all very well gaining *kudos*, for raising an enormous apparent revenue, out of a poor country like this, but the end of it will be, that the cultivators, European as well as native, will soon be driven forth, and Government itself will have no revenue; let us hope that this will be compensated when it finds itself the proud possessor, as far as eye can reach, of limitless fields of lantana, and ruined bungalows, once the pleasant homes of hard working Planters. It is a kind of vicarious suffering, which amidst our other troubles we find it rather difficult to bear with equanimity.

The best proof that coffee is not quite defunct and that some yet live who believe in it, is that there have been some extensive robberies of nurseries, and in one case, an entire new clearing, just planted was systematically cleared of every plant it contained.—*Madras Times.*

ADVERTING to the speedy growth of bamboos, which formed a subject of discussion some time ago in the papers, Mr. W. J. Addis, C.E., now in Burma, writes to say that he measured bamboos near the Western coast of India and in the Annamallay forest, and found them grow at the rate rate of 15 to 16 inches in 24 hours. A great deal, he says, depends on the soil and species of bamboos; and the growth is slower after they attain the height of 10 or 12 feet.—*S. F. Press*, Aug. 28th.

SUBSTITUTE FOR COFFEE.—We hear that natives who have become accustomed to coffee from having served as domestic servants with Europeans, make use of the beans of the yellow wattle, called by the Tamil "thumba chedi," as a substitute for the coffee berries. Treated in the same way as coffee berries, the thumba bean makes a beverage closely resembling coffee in taste and smell—only slightly more bitter. The pariahs mix it with burnt rice and say it is quite as palatable as coffee.—*Bangalore Spectator.*

WATER-RAISING APPLIANCES.—In a Madras Government Resolution on a recent agricultural show in the district of Salem, occurs the following passage:—

The results of the water-lift trials in competition for the prize offered under G. O., No. 650, dated 12th September 1888, were recorded in G. O., No. 2,263, dated 10th April 1890, and the present report confirms His Excellency the Governor in Council in the opinion that for moderate heights the superiority of later inventions over the common picottah has not been demonstrated. For greater lifts the leather bag worked by bullocks is very effective, and the practical difficulties involved in using iron, viz., its weight, expense, and the absence of facilities for its repair, detract from the utility of nearly all Western improvements. These objections apply with equal force to most implements of improved types, with the exception of sugar-cane mills: of these there was a fair show, and the Collector points out that the fact of a very large number of Massey's mills having been sold proves that the ryot is fully alive to the advantages of using a modern machine.

The "picottah" is the lever beam working between two uprights, the working of which is occasionally helped and accelerated by men or boys running up and down the beam. Its use in raising water from wells is common in Ceylon, especially in Jaffna where hundreds may seen in operation raising the water impregnated with fertilizing salts, for the garden culture of onions, chillies, brinjals, tobacco, &c.

Correspondence.

To the Editor.

HOW TO INTRODUCE CEYLON TEA INTO RUSSIA.

Dear Sir,—Your newspaper containing letter from an Anglo-Indian Major respecting the chances of introducing Ceylon tea into Russia through St. Petersburg I hove read with great interest.

I think the Major writes a good deal sense and agree with him that it is possible to introduce Indian tea not only into the capital of the great tea drinking people but also into the other towns of the Russian empire. The first step toward attaining this object is to remove the prejudice existing in the minds of the Russian grocers and tea dealers who are under the impression that Ceylon tea is scented by artificial means and is unfit for Russian consumers. Secondly, the planters should only send those qualities which would suit the Russian market either in that pure state or mixed with the weaker brands of Chinese tea. The writer has found from experience that the Russian public will not drink Ceylon tea in its pure state on account of its being too aromatic and strong in flavour. A Russian grocer to whom I sold several chests in Moscow made a handsome profit by mixing the superior brands of Ceylon tea with the inferior qualities from China. The best plan for the Ceylon planters is to be independent of the Russian grocers and the Russian tea merchants and open a *small* shop on their own account in St. Petersburg on the Nevski Prospect. They can then sell the tea in its pure and natural state as mixed with the Chinese brands and let their article stand or fall on its own merits. The writer is convinced that the only obstacle that prevents the Russian public from drinking Ceylon tea are ignorance and prejudice, and also because they have not yet accustomed their palates to the taste. Tea drinking, like many other things in this world, is a great deal a matter of imagination, especially among a people whose palates have not yet been educated by the questionable benefits of civilization. The Russian peasant who pays Roubles 2 a lb. for rubbishy tea has not much idea of aroma or qualities. So long as he is told it is "tchai" (tea) by the grocers, he believes them, and drinks the rubbish which they supply him with in blissful ignorance of what it is composed. It may be tea or it may be kapree grass for little he knows. It would not be difficult for the Ceylon planters to give him the genuine article at the same price as he is now paying for adulterated and rubbishy mixtures.

In case the writer, who has himself sacrificed money and time on this object, can be of any use to to the Ceylon planters by means of his influence with the Russian press, the merchants, or with the authorities, he is willing to offer them his services, provided that he is fairly remunerated for his exertions on their behalf.

If Indian tea is to be introduced into Russia there is no time to be lost, for the Russian merchants in China have already opened large shops in Moscow and St. Petersburg where the genuine tea is now being sold at a fair and just price. One of the principal shops was only opened this spring. It is fitted up in the Chinese style, and the assistants are Celestials. I hear they are doing a good business and I do not see why the Ceylon merchants and planters should not follow their example.—Yours respectfully,

WM. BARNES STEVENI,
St. Petersburg Correspondent for the *Daily Chronicle.*

PLANTS AND PESTS.

Franklands, Wattegama, Aug. 4th.

Dear Sir,—I have sent you by this train some cotton seed with numbers of red poochies taken out of an open box standing in an open shed near the store of this estate, also a branch of a tree called by the Sinhalese *godakirilla* growing on this estate. Wherever this tree grows you will find numbers of these red poochies swarming around and crawling all over the young branches living on the sap of the young shoots and flowers; the tree is nearly always in flower more or less. I have found by experience that whenever these poochies scent any of my cotton plants having flower and young pods they leave the godakirilla tree and at once attack the cotton flower and young pods. To test it further I placed some cotton seed sent to me by Mr. Joseph of Matale in a box as above described, and within a week the seed and box were covered by these poochies and only a few remained on the godakirilla tree. The distance from tree to the box is ⅛ mile. The Revd. S. Lindsay calling here yesterday: I showed him the box with cotton seed; the box and seed were covered with poochies. Though we have this enemy to destroy more or less our cotton crop, yet at times we will be able to secure a good crop, but we must not plant again the same land or land near it for a few years. It is only yesterday I met a planter who secured one good crop and obtained 40 cents per lb. from the Company, cleared some forty rupees per acre and in this year planting again in another district among cacao, and I have heard of others who could not clear their expenses. Cotton wants a good rich soil and good rains up to crop time. Insect pests will come and go; the home of the black bug was originally the mililla and rukattana trees, it afterwards took to our coffee; the croton bug and caterpillar had its home on the keppeti tree, afterwards destroyed the croton oil plant. Even the rats sometimes come by hundreds. I remember once, in a week about twenty acres fine coffee was destroyed by them on an estate I had charge of. We must ever be on the watch, and when we find an insect pest coming we must at once do our utmost to eradicate it before it gets too large a hold on us. The godakirilla tree on this estate is about 15 ft. high with a great spread of branches leaf oblong shape. I understand from natives they grow much larger in the jungle.—Yours truly,

J. HOLLOWAY.

[The tree of which Mr. Holloway sends us a specimen is the *Holoptelea integrifolia* of botanists, and the Tamil name is *ail*, *aiyilli*, or *kanchá*. There does not seem to be any affinity between it and cotton. The little red bugs or beetles, which, on the box being opened, ran about after a very lively fashion, are amongst the most common and most annoying pests of the cotton plant. We remember seeing them in multitudes on cotton cultivated in the Jaffna Peninsula in 1842 by the Messrs. Whitehouse brothers (who came to Ceylon from Demerara, by the way) and Mr. Hardy, and which cultivation was apparently not a success, for it was not persevered in.—Ed. *T. A.*]

KINO.

Nuwara Eliya, Aug. 18th.

Sir,—Will you kindly inform me, what is kino? How is it prepared? What is it used for &c.?

I have repeatedly been asked these questions.—Yours faithfully,

T. P.

[Kino is a general name used in the drug market for the astringent gums or inspissated juice of several trees, such as *Eucalyptus resinifera*, *Butea frondosa*,

and *Pterocarpus marsupium.* It is used medicinally, and also in the arts, especially in dyeing. The London market rate for gum kino is given each month in our *Tropical Agriculturist.*—ED. *T. A.*]

CACAO IN CEYLON.

Kandy, Aug. 18th.

DEAR SIR,—Your Uva correspondent "102s 6d," does not seem convinced of the accuracy of my statistics that, up to the season 1883-84, cacao went on increasing its yield to 5 cwt. an acre, but he admits that the be3t returns he knows of from cacao last year, are crops of 2 at 3½ cwt.

I suppose he did not understand my table, which for that period is as follows:—

235	acres	1876-77	@	5 cwt.	1,175cwt.
191	„	1878	„	4 „	764 „
1,953	„	1879	„	3 „	5,8 „
2,065	„	1880	„	1 „	2,065 „
4,444	„	in clearing gave the crop			9,863 „

The computation of this acreage can hardly be contesed in the face of yours, that, in March 1881, 5,460 acres were in cultivation; for it assumes that only about 1,000 acres have been planted in the season 1880-81, which is rather below the mark, as the general very successful results were then giving an increasing impetus to this cultivation which, but for the mysterious root disease that made its appearance in 1884, would have been an ELDORADO.

THE PACKING OF TEA DUST IN CHESTS.

Colombo, Aug. 25th.

DEAR SIR,—I wish to caution planters through the medium of your columns against packing tea dust in chests.

Some short time ago I purchased in local sale a break of dust the packages of which each contained 150 lb. of tea. Although they were doubly hooped before shipment they were landed in very bad order at the port to which they were shipped, some 6 lb. per package having run out in transit.

The maximum weight for dust should be about 70 lb., the greatest possible care being taken to see that the packages are not slack packed, lead linings free from holes and the lead of the thickest quality. The nails used by some planters are unnecessarily long: nothing is gained in strength by using nails longer than 1¼ inch, the probability being that if they are longer than this that they puncture the lead in being driven in.

I would warn planters against using planks of a less thickness than ½ inch, anything under this being insufficiently strong to stand the numerous movings the packages get between the estate and the retailer.—Yours faithfully, F. F. STREET.

NEW PRODUCTS IN CEYLON:—THE NEED FOR CULTIVATING A GREATER VARIETY OF PLANTS:

ARECAS—NUTMEGS—CLOVES.

DEAR SIR,—It is a matter of surprise to me that the cultivation of products other than tea is so much neglected by my brother planters. No doubt tea must be our main staple, but there is no reason why we should not derive auxiliary help from the cultivation of products suitable to the various climates and altitudes of our tea estates. Seeing, for instance, that land in the lowcountry, which has been proved by results to be well adapted to the successful growth of tea, will, in the majority of cases, be found suitable also for the development of other important industries, surely more might have been done in the direction of supplementary cultivations, especially by the large companies which have associated themselves with tropical agriculture in Ceylon of recent years. With the exception, however, of a few arecanuts alongside roads and boundaries the tea bush still enjoys an undisturbed possession of the soil on nearly every estate, and if a solitary nutmeg or clove tree encroaches upon the otherwise well-established monopoly it is more likely to be the result of accident than design. And yet there are few things that pay better than nutmegs if properly cultivated, and they can be combined with tea in moderate numbers (say 1,000 for every 100 acres) without fear of their ever materially affecting the yield of the tea. At present prices the annual return from a well-nourished nutmeg tree ranges from R20 to R50, and there is no early prospect of the cultivation of this valuable spice being overdone; for the reason, probably, that the trees take some considerable time to reach maturity, and planters in the West Indies a9 well as in the East look to quick returns first and permanent ones afterwards. In the district of Udagama some years ago a number of nutmegs were planted, but the conditions under which the cultivation appears to have been carried on would account for the disappointing result which followed. More recently, and under circumstances which justify the hope of a successful issue, the enterprising proprietor of an estate in the near neighbourhood of Awisawella has succeeded in establishing a large number of these trees, nor is it the first time that this gentleman has taken the lead in planting matters, though his professional duties give him but little time to follow up the experiments he initiates. On an estate in Matale where the climate, one would have thought, was rather too dry for nutmeg cultivation, the growth of several hundred five and six year old trees is excellent, and a maiden crop is now being gathered, which gives every promise of being followed by an abundant yield next season. In the Kelani Valley there should be little or no difficulty in establishing this very valuable tree, but I would advise wide planting, not more than 10 or 12 trees to the acre, or thinned out, at any rate, to this number after the sexes are determined, and all sickly trees should be promptly removed. For further particulars of this interesting cultivation permit me to refer my brother planters to the excellent work compiled by yourself "All About Spices," which should have a place in the library of every planter.—Yours faithfully, NUTMEG.

NEW PRODUCTS IN CEYLON—THE NEED FOR CULTIVATING A GREATER VARIETY OF PLANTS—NUTMEGS &c.

DEAR SIR,—Your correspondent "Nutmeg" in your issue of September 2nd, will be doing good service if he elicits any further information from planters of experience in the lowcountry and who may have more to say on the subject.

Despite the Udagama failure, it would appear that the Matale and Awisawella trials afford grounds for a good deal of expectation, though I much doubt the accuracy of the statement that so much as R50 annual return could be got out of a single tree,—and one of a species which in the Straits thrives in moist climates, yet in Matale, which is a dry climate, can, he says, be brought into bearing in 5 years!

The professional gentleman who is proprietor of the Awisawella estate may be congratulated upon his foresight, for if he has but 3,000 of such productive trees as your correspondent names, he has R15,000 as an annual return. So let us hope he is a lawyer and that nutmegs will win him from the pursuit of that baneful following.

Your correspondent "Peppercorn" once referred to nutmegs on a place not very far from the town of Kandy. Can you rouse him to tell us the age and powers and profits of the trees?—not however such profits as are derived as seed-bearers, but counting the profits at the ordinary market rates of nutmegs?

MOSCHATA.

LOCAL TEA SALES AVERAGES.

Sept. 3rd.

SIR,—After a very strange fashion the editor of the "Times of Ceylon" under the above heading seeks to console local sellers by telling them that in getting 41 cents per lb. for their tea at the local sales on the 27th ulto. they were very fortunate inasmuch that, compared with the local sale held on Jan. 8th, they were taking all things into consideration better off by 11 cents!

The view thus given to his readers is an altogether distorted one—what are the true facts of the case?

On Jan. 8th sellers locally instead of receiving as they did 45 cents only ought to have received 58 cents (a difference of 13 cents), this rate being the equivalent of the position of tea at that time, viz.:

Reuter's London average	..	1s
Demand rate of exchange	..	1s 5 5-32d

(These are the figures given by the local "Times!")

In the same way sellers locally on the 27th ult. instead of receiving 41 cents should have received but 40 cents or the equivalent of

Reuter's London average	..	10½d
Demand rate of exchange	..	1s 8 7-16d

(Figures given by "T. of C.")

so at this latter sale the sellers *actually got* 1 *cent per lb. more than the quotations then current sanctioned* as a "set off" against the clear loss of 13 cents on 8th Jan. sale.

The difference between the true value of Ceylon tea on the dates mentioned is no less than 18 cents and not 4 cents as has been *insinuated*, for, on

8th Jan. local sellers were *unfortunate* by	13 cents
27th Aug. local sellers were fortunate by	1 „
and this, and in no other way, can the difference ("the little difference") referred to by the editor of "T. of C." between the two sales be truly accounted for, viz. only..	4 „
	18 cents

In your issue of the 21st Aug., you give Messrs. Watson, Sibthorp & Co.'s report of the 12th idem, on the Calcutta local tea sales—we find there that at the sale held on 8th Aug., annas 6 and 8 pies was the average price obtained for 16,267 packages —six annas and eight pies equal 80 pies—and as there are in a rupee 192 pies against Ceylon cents 100—it follows that if we half the 80 pies we get very close on the Ceylon valuation of sales in Calcutta. In the case referred to about 41½ cents in the true equivalent, for in every 4 annas in the Calcutta price an additional Ceylon cent must be added after the half has been arrived at, to make up for the difference between 192 pies and 200 half cents = 1 rupee.

These Calcutta reports (they should appear regularly) are MOST INTERESTING, giving as they do the prices current locally and at the same period for the previous two years—thus your readers can compare the Calcutta local market with their own and draw *their own inferences*—true ones—not

DISTORTED.

P. S.—I have not a file of the *Observer* to refer to. May I therefore ask what the Calcutta average price was about the 8th Jan. last, and also, if you have got the report, on 27th Aug. last, I have seen no report since 12th Aug.

[The average price given in Messrs. Watson, Sibthorp & Co.'s report of 7th Jan., for the sales of 2nd Jan., was As. 7-1, or about 9¾d per lb. The average given in their report of 26th Aug., for the sales of the 21st, was 6 as., or about 10d per lb.—ED. *T. A.*]

CEYLON TEA IN RUSSIA.
LETTER FROM THE COMMISSIONER.

Kandy, Sept. 4th.

To the Editor, *Tropical Agriculturist*, Colombo.

Sir,—I beg to enclose copy of a letter received from Mr. Maurice Rogivue, Ceylon Tea Fund Commissioner to Russia giving interesting particulars regarding his mission.—I am, sir, yours faithfully, A. PHILIP, Secretary.

St. Petersburg, 23rd July to 14th Aug. 1890.

A. Philip, Esq., Secretary of the Ceylon Planters Association, Kandy.

TEA FUND.

Dear Sir,—I wrote you last from London on the 14th July, and arrived here safely on the 11th and 23rd same month.

BERLIN.—Passing through that place, where I remained two days, I visited Messrs. ——— a first class firm, who are willing to take up my agency for the sale of Ceylon Teas *exclusively in Berlin*, and with them I visited the two most important tea merchants of the place, viz. Messrs. ——— who are both prepared to *taste* and *try* our teas. Messrs. ——— my agents in London, have therefore been instructed by me to send, as soon as possible, to Messrs. ——— an assortment of tea samples, in small tin boxes, with prices of the different sorts and qualities, c. i. f. Hamburg and f. o. b. London.

They will also do the same for Mr. ——— in Konigsberg (Prussia), a good and active man, with whom I have also arranged to act as my agent there.

Both firms might be able to secure large orders for Ceylon Teas on their respective fields, and it is most important that they should receive samples with full particulars as regards quality, flavour and prices. Samples should be selected in all grades, from the commonest *pekoe souchong* to the best *broken* and *orange pekoe*.

ST. PETERSBURG.—From all the information I have been able to collect since my arrival here, I come already to the conclusion that there is a *great future* for Ceylon tea in Russia, where it is already pretty well-known, to a *very small extent* it is true, but still *appreciated* for its *purity* and *cleanliness of manufacture*, and it is not quite true what I have heard in London, that our teas are found too *strong* and *too dark in infusion*, the generality of Russians like a somewhat strong tea and do not at all object to a dark reddish colour, but, what they do not like, at least in St. Petersburg, is the sweet raspberry taste given to Ceylon teas by the water of the Neva!

I have already visited all the most important tea warehouses of this place, wholesale and retail—such as ——— &c. all very large tea houses, I have been very well received everywhere and every one of them have told me the same thing as above, but they are all desirous of seeing and tasting my samples, which unfortunately have not been cleared yet at the Customs.

The steamer "Viaka" bringing them over from London arrived here only last Tuesday the 17/29th

July and with all the difficulties, formalities and *bother* of Russian Customhouse, I have been yet unable to clear them, but hope to get them tomorrow when I shall store them in a small warehouse got by me for the purpose and pack them in ½ and ⅛ lb. packets, label these packets with labels, *as per enclosed patterns*, and distribute them to the several tea merchants, dealers, &c., here in Moscow, Nijni-Novgorod or otherwise, along with a short circular printed in English, German, French and Russian languages, of which I herewith hand you a facsimile.

Moscow and Nijni-Novgorod, I would like to visit shortly as soon as I can get away from this place to be in time for the large fair of the latter place.

Please note that I have to pay for *duty alone* of these tea, *roubles* 650 or a little over £70! other charges for warehouses, packing, petties &c., will amount to over £10. I should like to have the teas analysed by the Government Police analyst, another 50 or 100 roubles—advertised in the Press &c, or otherwise &c., &c., all most important matters, which cost a lot of money. I must live and this is very expensive in Russia, a voyage to Moscow and Nijni and stay there for a couple of months is another expense of at least 1,000 roubles? In Russia, the most autocratic country of the world, everything is done "a coupe de roubles" by "réclame" favors and tips and you can do nothing without tips; to get the key of everything, of every door, of success in business or otherwise, you must tip everybody from the lowest "mougique" to the most influential swell, and it is only in doing so that we shall introduce our Ceylon teas in this country. I have been told that a Chinaman last year has spent likewise over 30,000 roubles in opening a large Tea Retail Warehouse on the Nevskie Prospeckte (the largest and most central street here); he has now made his fortune; the Brazil Coffee Company has spent 3 years ago rouhles 50,000 to introduce their coffee here and are now doing all over Russia a very considerable paying business as their coffee is now to end [*sic* ?] and drunk by almost everybody.

Another coffee company of some kind, who would not spend the necessary currency in tips or otherwise and tried to do without it, did nothing at all and failed. This is Russia, and it is the same for everything and everybody!

Everyone I have seen here, with my numerous letters of introductions, tells me the same thing. Ceylon teas, with their superiority over Chinese teas, have here a *great* future, but it is no use of thinking introducing them in Russia if your Association is not prepared to spend money largely for the purpose.

His Excellency ———————, Director of the Mining Department, with whom I had a few days ago a long conversation on the subject, and who gave the same valuable introductions for Nijni Novgorod, viz: His Excellency, &c. told me that it is most important that I should go there where *everything* connected with business and trade in *general* is done every year. There I must get my teas tasted and *compared* with Chinese teas, beat the big drum, and from my visit there will mostly depend our success. Captain ————, the Hon'ble Inspector of the Russian Volunteer Fleet, and Mr. ————, Government Engineer (brother of the former), whom I also visited, told me the same thing and gave me also some valuable letters for Moscow and Nijni. The fair has already opened officially a few days ago, but it is only about a fortnight, that all the "haut commerce" will be assembled there and treat real business. My idea would be to leave St. Petersburg in a few days, after I have done here all the necessary; stay a few days in Moscow and then go to Nijni for a few weeks, coming afterwards back to Moscow, but this, after all my expenditure here, will necessitate a new grant of funds! All this is to show you that the work and undertaking are very difficult and that the success of my mission in Russia depends entirely on the amount of money "The Ceylon Tea Fund" is prepared to spend for the purpose, and I should like their committee to bear in mind that unless they are willing to make a real sacrifice of money to do the advertising properly and on a large scale, it would be of no use to do it at all, to throw away any more money, and I had better clear out of this country and return at once to *less expensive shores*. I have spent already in travelling expenses from London, duty of tea samples, hotel, carriage hire, &c. a great deal over £100 (of which I received only £66 up to the present time, from the Association and you can easily understand that with the £100 granted to me, I cannot go very far. It is not £100 which will be required, but *several one hundred pounds sterling*! Then I can almost guarantee the success.

All the foregoing remarks and reflections induced me to send the other day, on the 20th July-1st August, to Messrs. Malcolm, Kearton & Co., London, the following telegram:—"Beginning encouraging, large orders sure to follow, success depends entirely, large expenditure and voyage (to) Moscow (and) Nijni, duty paid (on) samples, Tea 60 pounds funds required immediate communicate Leake (to) open credit (with) credit.

M. R., Hotel Europe,"

which has been no doubt communicated to you by Mr. Leake, and I trust you have been good enough to place the matter before the Committee of the "Tea Fund" for their *immediate* consideration as there is no time to lose in order to be *in time* for the Nijni fair.

I shall at any rate require *at once* the balance of £33 due to me on the £100 granted, as I do not like the idea to be left here without money.

1. CUSTOMS DUTY AND WEIGHT OF TEA PACKAGES. Customs as already mentioned is most botherscme in Russia. The amount of papers, formalities of any kind, and time lost is simply *awful*, and here again you must tip every one from A to Z otherwise you can do *nothing*.

2. DUTY ON TEA is 21 *Gold Roubles* per pood or 40 Russian Pounds of which 124 equal 112 English Pounds (1 cwt). Payments at the customs must be made in *Gold Roubles* or Government *Coupons*.

The exchange at present is, about Roubles (silver or paper) 83, 75 to 84 for £10, 100 gold Roubles = 135¼ to 135¾ silver or paper roubles.

3. WEIGHT OF PACKAGES.—It is most important in making up an Invoice for Russia that the *gross*, *tare*, and *net* weights of *each package* are given *exactly* and *separately* for each Invoice. There are two ways of passing an invoice at the customs for duty, viz.,

a. As per Invoice sent by the shippers showing *gross*, *tare* and *nett* weights which are taken with an addition of 3 per cent on the *net*.

b. With 2 per cent allowance for *tare* on the *gross verified weight*; so that it is important that the tare should be less than 2 per cent of the gross weight.

The former entry is somewhat more favourable but requires a great correctness in weights, and would lead to serious difficulties and trouble, if the weights were found here, on verification, not quite accurate.

This is all what I have to report for the present, and I remain, dear sir, yours faithfully,

(Signed) M. ROGIVUE.

LETTER FROM THE COMMISSIONER TO MR. W. MARTIN LEAKE.

We have received for publication the following letter which has just reached the Secretary of the Planters' Association through Mr. W. Martin Leake:—

St. Petersburg, 1st—13th Aug. 1890.

Wm. Martin Leake, Esq.,

Secretary, Ceylon-London Association,

4, Mincing Lane, London, E. C.

Dear Sir,—Confirming my last letter of the 24th July 5th instant, I herewith beg to draw again your serious attention on the very important question of the "*Nijni Nogorovd Fair*" on which, as already mentioned, will chiefly depend the success of my mission to introduce Ceylon Tea in Russia. The fair will last only till the 20th instant (1st Sept.), and, as it takes 3 to 4 days to go there, it is now ample time to decide whether I have to go there or not, and in the affirmative whether the Tea Fund is prepared to defray my expenses for the purpose. I shall therefore thank you to send me soon, on receipt of this letter,

a telegram on the subject with positive instructions regarding "Funds" as I shall not leave St. Petersburg at any rate, before the 6th-18th instant. The Nijni Fair is the place where *every year* all the Russian merchants from St. Petersburg, Moscow, Odessa, in fact from every place in Russia, from Finland, Caucasus, Siberia &c., go to make their yearly purchases, *fix the prices* of produce, goods, *Tea*, &c., and transact all kind of business, and it is only after the fair that a merchant would be persuaded to give an order for any kind of goods. Everyone tells me and it is also my firm belief, that *there* is to be made our *first Réclame. There* our tea must be tasted and compared with Chinese tea; a capital idea would have been to open there a Kiosk for the sale &c. or gratis distribution of tea in cup and in packets, it is still feasible in the shape of a small shop or a tent (easy to be got there) but we ought to start *at once.* The advertisement would be splendid.

Going there I would take with me a first rate man, well recommended to me by the Swiss Consul. A man (Swiss) of 25 years' business experienced in Russia, speaking Russian fluently, who has been already several times in Nijni during the fair.

I estimate my expenses to go there with a stay of about 12 days, at about 30 Roubles a day, with the *most strict* economy, or say about 400 Roubles roughly speaking £50st for the trip, all charges of advertising, rent of a local [?] travelling and hotel expenses for two, included, and I think, for this amount, we ought not to lose our chance there.

Kindly consider the question with the committee of your Association, send a wire to Ceylon if you think it necessary and let me have a wire reply without delay.

My samples tea have been landed and cleared at the customs. I had to pay 668 Roubles or nearly £80st for duty and other charges. I have packed it in ⅛, ¼ and ½ lb. packets as per enclosed label in Russian language which I have found more suitable than the one adopted previously; and have already distributed them to a large number of merchants, hotels, restaurants, public bars and private people. The tea has been tasted now by many and, I am glad to say, that the general report and opinion is in favor of its *good quality,* wanting however more *strength* and *delicacy* in flavor and somewhat *too dear* to compete with Chinese tea. Contrary to what I have been told in London, Russians do not object to a *strong* and rather reddish *dark coloured tea.* They make it in the usual way, fill half of the glass or glasses (very seldom they use cups) with made tea, and, with the Samovar (hot-water bottle) always at hand, they fill up the glasses with hot-water, thus making a rather real [?] beverage of very little taste and flavor. The tea pot is again re-filled 3 or 4 times with hot-water until the infusion is quite exhausted and contains no more of aromatic particles. I really cannot say they drink good tea in Russia. What they look for here is more the *appearance* of the tea *before the infusion* and most of the people who have tasted my samples complained that they are *too dark* and have too little of that fine and sweet aroma, the smell before the infusion, which the Chinese Teas have even in the very inferior qualities. Strong, not too dark, high flavoured aromatic and coloured Teas, will I believe, always sell better here than others.

They also complained of our Ceylon packing in ½ and full chests which they qualify as being *rough, rustic, coarse* and *defective,* packages without appearance and neatness, most of them broken and made up with old pieces of all kind of wood, as it was the case with my 10 chests samples. This is a most important question and I think a little more care and attention could be paid in Ceylon as regards packing, there is no doubt that the generality of our chests are made *too roughly,* with all kind of bad wood, and are not strong enough to bear a long voyage and sometimes several transhipments. Would it not be possible and preferable—at least for Russia—to adopt a somewhat similar packing as in China, mat, &c., well made chests of about 25 to 50 pounds nett, *not larger* of tea with a *sliding lid* (the top plank cover instead of a nailed one and the whole chest wrapped in some kind of coloured paper, with printings of some kind (common) representing Ceylon views and or native subjects characters and prints, and again a light gunny wrapper to cover the whole chests. Appearance and neatness for a produce of this kind is a great thing for Russia, and there is no doubt that a well made, neat and well presented package will improve its contents at the eyes of the buyers. It will be, I know, a little more [?] experience for the Ceylon planters, but would greatly facilitate the introduction and sale in Russia, at least for the beginning when all kind of sacrifice has to be made, later on, it will be easy to revert to the old system.

In a long conversation I had again the other day with Captain Vachtina, Director of the Russian Volunteer Fleet, he told me that another good plan for our success would be to have in Odessa a stock of tea of some importance ready to be cleared at the Customs in small quantities proportionally to our sales, there and or in the interior of Russia, and he offered and [?] if these teas were sent direct from Colombo to Odessa by their Volunteer Fleet steamers to place at the disposal of Tea Fund and [?] of their loaded warehouses and to store the tea there *in bond free of rent,* for any length of time, until they are sold by me. This would be of great advantage considering the heavy duty and exorbitant charges of any kind of a Russian Customhouse. This question has to be seriously considered.

Funds.—Messrs. ———, my agents in London, have remitted and [?] a cheque for roubles 166·95 equivalent of £st20 being the balance of £33 6s 8d for the last instalment of the £100 *grant* and I am much surprised to see that they have deducted from that balance (33 6/8) the excess over £30 *grant of tea* of their invoice for samples, although you had positively told me in London that you would take it upon your own responsibility to settle this difference on account of the Tea Fund.

It is useless to think that I can *sell* my tea samples, thus my *costs* allowance is reduced to £90 or rather £86 only, viz. :—

£33 6s 8d received in Colombo
£33 6s 8d received from you in London
and £20 received from Messrs. M. K. & Co.

who are even out of pocket for £2 10s 4d *to my debit.*

My expenses up to the present time amounts now to over £150 of which at least £140 are on account of the *Tea Fund* as per enclosed extract, leaving over £54 *out of my own pocket* and it is easy to understand that I am spending more and more daily.

I therefore leave you and your Committee judges of the situation which is to become *very critical* for me, as well as for my mission, if I am not placed immediately in funds. If I had known before all what I know now and what a country Russia is for expenditure, I would have never started on such condition as I did.

I shall be very thankful to you if you would kindly weigh very carefully the foregoing questions and place them *without delay* before the committee of the London Association for an *immediate decision* in all the matters. I repeat it, there is no time to lose and I shall wait *here* your wire reply up to the 6-18th instant, on that date I hope leaving for Moscow where my address will be

"*Hotel Dussan, Moscow.*"

You may communicate this letter to Ceylon, having no copying press I am unable to take more than one good copy of my letters.

It may interest you to hear that two Volunteer Fleet steamers have arrived the other day at Odessa from Vladivostok, with 800,000 pouts equal to about 29,000,000 English pounds, of Chinese tea, of which 40,000 pouts remained in Odessa and the rest is to go into the interior of Russia. Hoping to hear soon from you,—I remain, dear sir, yours faithfully,

(Signed) M. Rogivue.

Extract of Expenditure.

	£	s.
From Lausanne to London with luggage	6	00
A fortnight stay in London, hotel, carriages hire	12	00
Second class book ticket from London to St.		

Petersburg, luggge &c.	14	00
Stay in Berlin and Königsberg, carriages &c.	4	00
Album for Ceylon photographs and box	1	10
Printing of circulars, labels, cards, paper for packing tea samples &c.	5	00
Duty on tea and customs and other charges	80	00
Rent of a small godown for tea	2	00
Expenses in St. Petersburg, three weeks parterprete [?] hotel, carriages &c., much over	12	00
	36	1

St. Petersburg, 1/13th Aug. 1890.

M. R.

EXPORT OF COFFEE AND PEPPER FROM THE MALABAR COAST.

Tellicherry, Sept. 8th.

DEAR SIR,—Accompanying this we have the pleasure to hand you our annual statement of exports of coffee and pepper from the west coast for the year e nding June 30th last.

Coffee.—Although from the figures given it wil be seen that the total exports of coffee for the past season exceeded those of the previous year, the result taken all round was disappointing and it was a fortunate thing for all concerned that such excellent prices were obtained. Mangalor still continues to receive an appreciable quantity of coffee from North Coorg and Mysore. Tellicherry on the other hand, which may be said to be the central market for coffee on the west coast, drawing a considerable quantity from other ports, is falling off considerably in its actual receipts from upcountry owing to the almost complete extinction of estates in North Wynaad and decreasing crops in South Coorg. Calicut and Beypore both show an improved export as compared with the previous year.

Prospects for the coming crop are decidedly gloomy, and it is very evident that whether owing to want of labour, abnormal seasons, or leaf-disease, it is a recognised fact that crops generally even in the most favored districts are gradually decreasing and this in spite of a larger acreage coming under cultivation, and we anticipate that we shall see a very considerable falling-off in exports for the coming season as compared even with the past.

Pepper.—It will be seen that last year's exports exceeded those for the six years shown in our statement, and we may add that a very considerable quantity of last year's crop is still being held. Prices fell very considerably, and with the reported increase in Singapore, Penang and Java yields and a rising exchange, growers will have to accept still lower prices if business is to result.

The coming crop is reported to be an average one.—We are, dear sir, yours faithfully,

RALPH TATHAM,

p. pro ALSTON, LOW & CO.,

To	Mangalore. Coffee. Plan.	Mangalore. Coffee. Nat.	Mangalore. Coffee. Total.	Mangalore. Pepper.	Cannanore. Coffee cwt.	Cannanore. Pepper cwt.	Tellicherry. Coffee. Plan.	Tellicherry. Coffee. Nat.	Tellicherry. Coffee. Total.	Tellicherry. Pepper.	Badagherry Pepper.
London Cwt.	37,627	...	37,627	64	...	...	17,461	3,996	21,457	9,033	...
Marseilles ,,	...	7,614	7,614	...	...	...	142	24,384	24,526	7,887	...
Havre ,,	...	1,733	1,733	...	...	249	...	47,964	47,964	32,191	...
Genoa ,,	...	...	...	...	...	...	...	2	2	1,363	...
Trieste ,,	950	...	950	...	...	...	2,334	3,042	5,376	510	...
Naples ,,	...	...	...	...	...	...	...	...	...	1,425	...
Antwerp ,,	...	...	...	...	...	...	...	2,026	2,026	312	...
Melbourne ,,	...	...	...	...	...	...	...	...	...	...	...
New York ,,	...	...	...	...	...	...	...	...	...	400	...
Sydney ,,	...	...	...	...	...	...	...	...	...	...	...
Suez ,,	...	...	...	...	...	72	...	387	387	1,030	...
Turkish, African & Arab	...	5,379	5,379	255	...	978	...	1,515	1,515	720	...
Ceylon [Ports	3	..	3	...	...	...	11	3	14	109	...
Bombay and other Indian [Ports	1179	43,853	45,032	570	12	29095	278	10,875	11,153	22,975	985
							20,410	96,160	116,570	83,461	
Less Imports							7,935	43,619	51,554	15,255	
1889-90 cwt.	,759	58,579	98,338	889	12	30394	12,475	52,541	65,016	68,206	985
1888-89 ,,	31,900	36,896	68,796	1242	...	21022	15,986	53,034	69,020	37,408	1165
1887-88 ,,	67,405	67,505	134,910	855	129	23120	36,329	65,036	101,365	66,692	...
1886-87 ,,	29,3-3	30,610	59,993	913	..	...	24,981	65,526	90,507	59,482	...
1885-86 ,,	49,084	64,774	113,858	968	...	...	42,836	48,888	91,724	56,944	...
1884-85 ,,	41,339	45,122	86,461	1232	...		24,661	52,837	77,498	53,344	...

To	Calicut. Coffee. Plan.	Calicut. Coffee. Nat.	Calicut. Coffee. Total.	Calicut. Pepper.	Beypore. Coffee. Plan.	Beypore. Coffee. Nat.	Beypore. Coffee. Total.	Beypore. Pepper.	Cochin. Coffee. Plan.	Cochin. Coffee. Nat.	Cochin. Coffee. Total	Cochin. Pepper.
London Cwt.	24,536	...	24,536	846	22,431	...	22,431	...	...	54	54	800
Marseilles ,,	270	680	950	301	...	...	...	...	...	...	...	...
Havre ,,	402	3,032	3,434	2,450	...	...	...	...	...	500	500	1,724
Genoa ,,	...	...	...	...	...	...	...	...	...	...	...	...
Trieste ,,	3,740	...	3,740	...	799	...	799	...	...	...	...	...
Naples ,,	...	...	...	451	...	...	...	...	...	...	...	...
Antwerp ,,	...	...	...	300	...	...	...	...	...	1	1	...
Melbourne ,,	351	...	351	...	...	...	...	...	...	...	...	...
New York ,,	...	...	...	...	...	...	...	...	...	...	...	...
Sydney ,,	165	...	165	...	...	...	...	...	...	...	...	...
Suez ,,	...	124	124	92	...	...	...	...	...	...	...	...
Turkish, African & Arab	...	370	370	729	...	...	...	...	...	...	...	...
Ceylon [Ports	...	1	1	...	...	...	...	...	...	...	...	62
Bombay and other Indian [Ports	8,213	6,919	15,132	6,967	258	...	258	...	...	271	271	6,770
1889-90 cwt.	38,815	11,344	50,159	13,800	23,488	...	23,488	..	...	826	826	9,356
1888-89 ,,	35,447	23,236	58,683	11,514	15,998	1,423	17,421	500	677	959	1,636	22,432
1887-88 ,,	29,224	21,243	50,467	14,311	38,059	57	38,116	64	2,357	2,948	5,305	16,486
1886-87 ,,	42,836	11,442	54,278	10,668	36,109	2,511	38,620	...	7,833	1,834	9,667	24,217
1885-86 ,,	49,641	15,475	65,116	14,174	...	...	36,790	...	7, 80	965	8,745	10,166
1884-85 ,,	...	...	60,753	10,723	...	...	34,562	...	4,46	1,062	5,528	14,219

To	Quilon. Coffee	Quilon. Pepper.	Alleppey. Coffee	Alleppey. Pepper.	Total. Coffee. cwt.	Total. Pepper cwt.
London Cwt.	2,644	15	721	472	109,470	11,230
Marseilles ,,	...	...	...	325	33,090	8,513
Havre ,,	...	...	..	...	53,631	36,604
Genoa ,,	...	...	...	...	2	1,363
Trieste ,,	...	...	...	...	10,865	5 0
Naples ,,	...	...	...	...	...	1,876
Antwerp ,,	...	...	...	...	2,027	612
Melbourne ,,	...	...	...	...	351	...
New York ,,	...	...	...	...	...	400
Sydney ,,	..	...	...	...	165	...
Suez ,,	...	...	...	..	511	1,194
Turkish, African & Arab	476	124	...	...	7,740	2,806
Ceylon [Ports	...	10	...	336	18	517
Bombay and other Indian [Ports	...	...	150	16,345	72,008	83,707
					293,384	156,512
Less Imports					51,554	15,255
1889-90 cwt.	3,120	149	871	17,478	241,830	141,257
1888-89 ,,	2,483	36	1,916	4,858	219,955	101,177
1887-88 ,,	4,174	112	1,293	14,965	335,759	136,605
1886-87 ,,	2,922	18	268	11,678	256,255	106,976
1885-86 ,,	7,732	115	1,510	18,437	325,475	100,804
1884-85 ,,	14,042	156	1,912	11,842	280,756	91,516

*. Including the following:—For Ancona, 1,000 cw Tellicherry Pepper, and 100 cwt. Calicut Pepper. For Veni

A PROLIFIC TUBER.—Some time ago a Montrose gentleman received from a friend in Minnesota, United States, a potato which, for curiosity, he planted whole. On being dug up it was found to have yielded no fewer than forty-six potatoes.—*Inverness Courier*. [The other day at Albion estate, New Galway, we saw between 20 and 30 potatoes gathered from one stem.—ED. *T. A.*]

MINOR AILMENTS AND THEIR CURES.

I

AGUE.—Ague, or intermittent fever, is a common ailment and results from the decomposition of vegetable matter. It is what is called a periodical complaint, the attacks coming on at stated intervals, the patient meanwhile being to all appearances perfectly well. An attack of ague is usually divided into three stages: the "cold" stage, during which the sufferer shivers violently; the "hot" stage, in which he or she complains of a burning heat; and the "sweating" stage, in which the patient perspires profusely.

This complaint untreated, shows no tendency to get well. Its medicinal treatment is perfectly simple, and in acute cases there is no difficulty in obtaining relief. An excellent remedy is quinine, which is best administered in the form of Tabloids of Bisulphate of Quinine, each containing five grains. It is customary to administer three of these Tabloids between two successive attacks of the disease.

ANÆMIA.—This is the medical term for poorness of the blood, a condition which occurs most frequently in young and badly nourished females. There is always more or less pallor of the face and lips. The appetite is poor; the patient has great difficulty in doing her work; has puffiness about the face, legs, and ankles; the circulation is weak; and not infrequently palpitation of the heart is a common symptom.

This condition goes on progressively increasing unless remedial treatment is resorted to. A most useful preparation of iron, which is the best remedy in these cases, is the Wyeth Dialysed Iron, ten drops of which are usually administered on a lump of sugar five times daily. It has a great advantage over most other preparations of iron from the fact that it does not tend to constipate. A course of this treatment, extending over three or four weeks, will usually effect a cure.

To prevent a return of this complaint Elixoid of Calisaya Bark will be found useful, a tablespoonful or more being taken three times a day. The patient should take plenty of exercise in the fresh air and should be well fed, a little stimulant in the form of stout being taken at meal times only.

BURNS AND SCALDS.—One of the best remedies for a burn is Carron Oil, a mixture of equal parts of linseed or olive oil with lime water. Another admirable remedy is bicarbonate of soda (cooking soda), a small box of which should always be kept at hand for immediate use. Cover the burn with it, and bind up with a dry and soft pocket-handkerchief. Hazeline may be applied to the part to allay pain; it also promotes the healing of the injured surface.—"*Health*," London.

231 cwt. Tellicherry Pepper and 201 cwt. Calicut Native Coffee. For Hamburg, 1,615 cwt. Tellicherry Native Coffee and 2,785 cwt. Pepper; 1,117 cwt. Calicut Plantation Coffee and 1,100 cwt. Pepper. For Rotterdam, 200 cwt. Tellicherry Pepper. For Bremen, 250 cwt. Tellicherry Native Coffee, and 200 cwt. Pepper; 21 cwt. Calicut Plantation Coffee, 12 cwt. Native Coffee and 464 cwt. Pepper. For Hongkong 5 cwt. Calicut Native Coffee. For Odessa, 184 cwt. Tellicherry Plantation Coffee, 101 cwt. Native Coffee and 1,100 cwt. Pepper.

THE TIMBER TREES OF NEW ZEALAND are mostly pines, and very slow of growth, especially the kauri pine, which only grows in the extreme north of the North Island. I saw a kauri sapling (in a government garden in Wellington) which is thirty years old and which is not more than twelve feet high.—*Dunedin Cor.*

ACCORDING to a note in the June issue of the *Revue de l' Horticulture Belge et Etrangère*, there is in the gardens of the palace at Versailles an orange tree more than 450 years old. It is said to have been the first introduced into France, and is known as the "Grand Connetable." The seeds from which it grew were sown at Pampelune about 1416 by Elēnor of Castile, wife of Charles the Third, King in Navaare. Later the tree was brought to Chantilly, then to Fontainebleau, and finally, in 1864, was added to the collection of Versailles. The handsomest Orange-trees, grown in tubs in France, are those in this collection and in those of the gardens of the Tuileries, and of the Luxembourg Palace in Paris. The gardens of the Palace of Compiegne still contains fifty large specimens, brought there during the reign of Napoleon I. There are also collections of these curious old Orange-trees supposed to be several centuries old in a number of private gardens belonging to various French chateaus. They are always carefully tended, and produce year after year surprising crops of flowers and a good deal of fruit, considering how long their roots have been cramped within narrow quarters.—*Garden and Forest.*

CEYLON EXPORTS AND DISTRIBUTION 1890.

COUNTRIES.	Coffee cwt.			Cinchona	Tea.	Cocoa	Cardamoms.	Cinnamon.		Coconut Oil.		Plumbago.
	Plantation	N'tive	Total.	1890 B'nch & Trunk lb.	1890 lb.	cwt.	lb.	Bales lb.	Chips lb.	1890 cwt.	1889 cwt.	1890 cwt.
To United Kingdom ...	47754	100	47854	5977390	32827266	8161	117178	795497	166828	40034	80259	110228
,, Marseilles	157	...	157	12500	612	80	...	63100	2800	3000	...	...
,, Barcelona	...	...	...	...	...	...	...	32500	...	...	...	...
,, Genoa	12	...	12	...	1714	...	...	41425	22624	2061	2477	...
,, Venice	71	232	303	70412	1815	...	...	9000	11200	...	...	...
,, Trieste	7825	97	7922	252	1370	...	...	3900	8848	10895	6730	...
,, Odessa	32	...	32	...	215	...	...	...	...	700	3416	...
,, Hamburg	296	...	296	730	30819	814	1131	213800	52772	10459	7464	29421
,, Antwerp	17	20	37	128991	1600	...	...	19500	5600	1161	1492	13697
,, Bremen	18	...	18	...	13427	151	...	20606	...	...	...	5068
,, Havre	...	100	100	...	4761	..	...	10000	...	2007	4578	...
,, Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
,, Africa	16	...	16	...	35972	...	...	5000	...	8	...	...
,, Mauritius and Eastward	223	316	539	...	49282	498	...	7500	...	40010	1807	...
,, India	828	718	1546	...	96732	...	114191	5020	...	66870	31194	210
,, Australia & New Zealand	7138	960	8098	...	1564877	9	40	7960	...	1213	1944	342
,, America	1924	...	1924	317658	134023	1389	4956	69228	...	38322	77744	115469
,, Stockholm	...	...	...	...	1703	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 25th Sept. 1890	66314	2543	68857	6529317	34768299	11157	237496	1304036	281872	216750		276051
Do 1889	56564	4024	60706	7151076	24517539	11713	208614	1777473	365993	219105		309802
Do 1888	108890	4435	113325	8899948	16355864	10377	203724	1236240	384959	278656		185514
Do 1887	144998	6112	151158	9491856	9205124	13862	226893	1072753	213588	182822		158530

Constantinople 2122 lb. Tea.

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, September, 11th 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White	Slightly softish to good hard bright	£5 10s a £7 10
Yellow	Do. drossy & dark ditto...	95s a 110s
CINCHONA BARK--Crown per lb.	Renewed	3d a 1s
	Medium to fine Quill	4d a 9d
	Spoke shavings	2d a 9d
	Branch	1d a 3d
Red	Renewed	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings	2d a 5d
	Branch	1d a 3d
	Twig	1d a 1½d
CARDAMOMS Malabar and Ceylon	Clipped, bold, bright, fine	1s 8d a 3s 6d
	Middling, stalky & lean	10d a 1s 6d
Alleppee	Fair to fine plump clipped	1s 4d a 3s 4d
Tellicherry	Good to fine	1s 3d a 2s 3d
	Brownish	9d a 1s 3d
Mangalore	Good & fine, washed, bgt.	1s 6d a 2s 8d
Long Ceylon	Middling to good...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill	7½d a 1s 7d
2nds	,, ,, ,, ,,	7d a 1s 4d
3rds	,, ,, ,, ,,	6d a 1s 2d
4ths	Woody and hard...	5½d a 11d
Chips	Fair to fine plant...	2½d a 7½d
COCOA, Ceylon	Bold to fine bold	89s a 95s
	Medium	78s a 85s
	Triage to ordinary	60s a 70s
COFFEE Ceylon Plantation	Bold to fine bold colory...	10-s a 113s
	Middling to fine mid.	105s a 107s 6d
	Low mid. and Low grown	100s a 104s 6d
	Smalls	100s a 104s
Native	Good ordinary	92s a 98s
Liberian	Small to bold	90s a 96s
East Indian	Bold to fine bold...	105s a 115s
	Medium to fine	100s a 105s
	Small	93s a 98s
Native	Good to fine ordinary	92s a 98s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush	Ord. to fine long straight	£15 5s a £28
Stuffing	Coarse to fine	£5 a £18
COIR YARN, Ceylon	Ordinary to superior	£13 a £30
Cochin	Ordinary to fine	£12 a £36
Do	Roping fair to good	£12 a £15 10s
COLOMBO ROOT, sifted	Middling wormy to fine...	18s a 27s 6d
CROTON SEEDS, sifted	Fair to fine fresh...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold...	50s a 65s
,,	Small and medium	26s a 39s
Rough	Fair to fine bold...	20s a 25s
...	Small	14s a 18s 6d
GUM ARABIC, Madras	Dark to fine pale	15s a 55s
NUX VOMICA	Fair to fine bold fresh	10s a 12s
	Small ordinary and fair	6s a 8s 6d
MYRABOLANES Pale,	Good to fine picked	10s a 10s 9d
	Common to middling	8s a 8s 9d
	Fair Coast...	8s 9d a 9s
Pickings	Burnt and defective	4s 9d a 6s 3d
OIL, CINNAMON	Fair to fine heavy	1s a 2s 6d
CITRONELLE	Bright & good flavour	⅜d
LEMON GRASS	,, ,, ,,	1¼d a 1⅜d
ORCHELLA WEED	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	4¾d a 5¼d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White	,, ,, ,,	1s 1½d a 1s 2½d
PLUMBAGO Lump	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips	Slight foul to fine bright	9s a 12s
dust	Ordinary to fine bright...	5s a 9s
RED WOOD	Fair and fine bold	£4 10s a £4 15s
SAPAN WOOD	Middling coated to good	£5 a £8
SANDAL WOOD, logs	Fair to good flavor	£30 a £58
Do. chips	Inferior to fine	£9 a £30
SENNA, Tinnevelly	Good to fine bold green...	5d a 8d
	Fair middling medium...	2d a 4d
	Common dark and small	1d a 2d
TURMERIC, Madras	Finger fair to fine bold [bright	15s a 17s
Do.	Mixed middling	14s a 15s
Do.	Bulbs	10s a 12s
Cochin	Finger	10s a 11s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	16s a 23s
2nds	Foxy & reddish 5 a 8 ,,	13s a 18s
3rds	Lean & dry to middling under 6 inches	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Socotrine	Good and fine dry	£4 a £7
Zanzibar & Hepatic...	Common and good	40s a £5 5s
CHILLIES, Zanzibar	Fair to fine bright	32s a 3 [illegible]
	Ordinary and middling...	28s a 31s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright	5½d a 5¾d
	Common dull to fair	4½d a 5⅛d
Stems...	Common to good	1⅛d a 1¼d
COCULUS INDICUS	Fair	10s a 11s
GALLS, Bussorah & Turkey ₩ cwt.	Fair to fine dark blue	52s 6d a 57s 6d
	Good white and green...	40s a 50s
GUM AMMONIACUM per [cwt.	Blocky to fine clean	20s a 50s
ANIMI, washed, ₩ cwt.	Picked fine pale in sorts,	£13 a £15s
	part yellow and mixed	£10 a £13
	Bean & Pea size ditto	£5 a £8 10s
	amber and red bold	£10 a £12
scraped...	Medium & bold sorts	£5 a £8
ARABIC E.I. & Aden..	Sorts	32s a 75s
per cwt. Ghatti	Sorts to fine pale	20s a 65s
Amrad cha	Good and fine pale	50s a 65s
	Reddish to pale brown	25s a 45s
ASSAFŒTIDA, per cwt.	Clean fair to fine	26s a 38s
	Slightly stony and foul	16s a 25s
KINO, per cwt.	Fair to fine bright	25s a 30s
MYRRH, picked ,,	Fair to fine pale	£5 a £7 10s
Aden sorts	Middling to good	72s 6d a 80s
OLIBANUM, drop	Fair to fine white	35s a 55s
per cwt.	Reddish to middling	25s a 34s
,,	Middling to good pale	12s a 20s
pickings...	Slightly foul to fine	10s a 15s
siftings...		
INDIARUBBER Mozambique, per lb.	red hard	2s a 2s 6½d
	white softish	1s 5d a 2s
Ball & Sausage	unripe root	1s a 1s 11d
	liver	1s 3d a 2s 3d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb.	Nearly water white	4d a 4¼d
2nds ,,	Fair and good pale	3⅝d a 3¾d
3rds ,,	Brown and brownish	3¼d a 3½d
INDIARUBBER Assam, per lb.	Good to fine	2s a 2s 6d
	Common foul and mixed	9d a 1s 10d
Rangoon	Fair to good clean	2s a 2s 4d
Madagascar	Good to fine pinky & white	2s 9d a 3s 2d
	Fair to good black	2s a 2s 6d
SAFFLOWER	Good to fine pinky	60s a 70s
	Middling to fair	40s a 60s
	Inferior and pickings	15s a 25s
TAMARINDS	Mid. to fine black not stony	10s a 12s 6d
	Stony and inferior	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt.	Fair dry to fine bright	22s 6d a 24s
	Common & middling soft	12s a 21s
Natal	Fair to fine	none here
ARROWROOT Natal per lb.	Middling to fine	2d a 3½d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ₩ cwt.	Good, pure, & dry white ,, ,, pink	107s a 160
Japan	Ordinary to fine free	33s a 40s
GAMBIER, Cubes, cwt.	Pressed	nominal
	Good	25s 6d a 25s
Block [per lb.	Fine clean Banj & Macassar	3s 6d a 5s
GUTTA PERCHA, genuine	Barky to fair	2s a 3s 9d
Sumatra	Common to fine clean	4d a 2s
Reboiled	Good to fine clean	2s a 3s
White Borneo	Inferior and barky	1s 4d a 2s
NUTMEGS, large, per lb.	57's a 80's, garbled	2s 10d a 4s
Medium	83's a 95's	2s 8d a 2s 9
Small	100's a 160's	1s 6d a 2s 7½
MACE, per lb.	Pale reddish to fine pale	2s 6d a 2s 10
	Ordinary to fair	2s 1d a 2s 4d
	Chips and dark	1s 6d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound	1s 3d a 3s 2
	Darkordinary & middling	8d a 1s 3d
High dried	Good to fine	9d a 1s 2d
	Dark, rough & middling	3d a 7d
SAGO, Pearl, large, ₩ cwt.	Fair to fine	17s a 18s
medium	,, ,, ,,	15s a 17s 6d
small	,, ,, ,,	10s 6d a 13s
Flour	Good pinky to white	8s a 12s
TAPIOCA, Penang Flake [per lb.	Fair to fine	2d a 2½d
		2d a 2½d
Singapore	,, ,,	1⅞d a 2⅜d
Flour	,, ,,	10s a 15s
Pearl	Bullet, per cwt.	21s a 21s 6d
	Medium ,,	16s a 17 6d
	Seed ,,	17s a 18

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for October :—

LIQUID MANURES.

"WHAT would you say," remarked a well-known agriculturist, speaking to a body of farmers, "if, instead of serving up the liquid portion of your morning beverage of tea, the good wife poured it into the sink, and set in front of you nothing but the tea leaves with a little pepper and salt to aid digestion? Go where you will, you will see running to waste the very essence of what would, if properly stored and utilized, turn a loss account into a profit account at the end of a financial year." The simile quoted above, though it helps to impress one with the ignorance displayed in the ordinary treatment of the excreta of farm animals, is, however, not quite correct; for while the value of tea leaves after the essence has been soaked out of them is practically *nil* to the tea drinker, the solid excreta of stock not only possess, if properly handled, a high fertilizing value, but also serve to improve, in a marked degree, the mechanical condition of the soil. But the fact remains that the urine of animals is really the richest part of their voidance. The urine not only contains a large proportion of nitrogen, phosphoric acid, and potash resulting from the disintegration of animal tissues, but these most valuable ingredients are held in solution, and are most readily assimilable by plants. And yet in this country it is the rule to find the liquid manure from cattle sheds and the dark-coloured drainings from the dung heap allowed to drain off or be washed off, so that it is lost to the cultivator altogether. On the other hand, scientific agriculturists and a few who perhaps know very little of science, are showing a just appreciation of the great value of liquid manure. Some years ago the Highland Agricultural Society of Scotland offered a prize of £400 for the best scheme of utilizing the urine of house-fed animals. It is evident, however, that the best method of utilizing liquid manure will depend on the different circumstances of each individual cultivator. Where cattle are fed in covered sheds, and where litter is plentiful, the urine is best secured by being absorbed by the litter, so that both liquid and solid excreta are carried off together. Again where urine can be conveniently stored in a tank, soil, leaves, sawdust and various forms of refuse matter should be put in the tank, for in the course of filtering through these substances the liquid deposits a large proportion of the valuable materials it holds in solution, and the contents of the reservoir become a useful manure. Again, there is the option, where convenient, of distributing the manure in the liquid form without using any absorbents, but care must be taken in adopting this method. Fresh and undiluted urine, as is well known, has a caustic and injurious effect on vegetation, but when diluted to any appreciable extent, its application never fails to cause a great increase in the crop. Of course, the diluting of the liquid increases the labour and cost of application, but the undiluted liquid cannot be safely applied until it has fermented and decomposed, which will cost a loss of its ammonia unless care be taken to prevent that. The best way of fixing the ammonia in the case of either solid or liquid manure is to add a little gypsum, a very cheap fertilizer, which converts the volatile ammonia into non-volatile sulphate of ammonia.

The most inexpensive method, and that best suited for small landowners, is perhaps the using of absorbents to soak up all the liquid part of the excreta. The urine might be led off into a pit containing these absorbents, or what is still easier the cattle sheds should be strewn with them. Cattle belonging to natives seldom have any form of litter given them, and are generally allowed

to lie on the ground, cold and wet owing to absorption of liquid. Thus the use of litter will not only secure the urine for manurial purposes, but will also benefit the cattle. Straw, sawdust, wood-shavings, coir fibre and coir dust are admirably suited both as bedding and absorbents but where none of these can be conveniently used, even dry leaves, or dry powdery earth should be made use of, so that at least some of the valuable ingredients of liquid manure may be secured instead of being wantonly allowed to run to waste. Care should be taken that whatever absorbents are used, they should not be allowed to lie and decompose in the cattle-sheds, but should be regularly swept away, and new stuff laid on.

Even where cattle are indiscriminately herded together for the night, provision should be made for absorbing the liquid manure. If some such means are adopted by small cultivators, the result will not only be beneficial to the health of cattle as giving more comfort and warmth and securing better sanitation, but also when the refuse with the absorbed liquid is applied to the land, will prove to be of material advantage to their sadly-neglected soils. Those who own cattle but no land to speak of, should also be encouraged to adopt the methods indicated so as to dispose of the resulting manure to some advantage, for undoubtedly it will possess some money value.

OCCASIONAL NOTES.

We are in receipt of the first annual report of the School of Industry, Haputale. It is needless to dwell on the good work done by this institution, the success of which is secured under the superintendence of so able and energetic a worker as Mr. Langdon. "For the farm-work and agricultural teaching," says the report, "the Government has kindly granted us a large reserve of land surrounding the school, on which we hope, by and bye, as the institution developes to cultivate some paddy, potatoes, perhaps cotton, and possibly do some pasturing." According to the Government Inspector's report, dhall, tobacco, cotton, tea and coffee are being cultivated. The students above 9 years of age are instructed in theoretical and practical agriculture by Mr. E. T. Hoole, the enthusiastic Agricultural Instructor, who is an old boy of the Colombo School of Agriculture. We wish this worthy institution all success, and earnestly hope it will receive the support which it deserves.

A visit to the Colombo Lunatic Asylum lately, impressed us with the idea of how much could be done with the mentally-afflicted by tact. It is only one who has made a long and careful study of the insane that can superintend an asylum for this class of unfortunates with any success. One has to study carefully the peculiar traits of the inmates and the inclination and aptability of each individual, before he can utilize the manual power which lay in them, so that labour may at the same time be a source of pleasure to the workers, and, secondarily, a source of income to the establishment which does so much for their support and comfort. The labour of man has been divided by some into (1) purely mental labour, (2) labour with reason, and (3) purely manual labour. The labour got out of the insane would of course come under the third heading of purely manual labour, or labour which calls for no exercise of the reason. It is this kind of labour which is generally allotted to those whose intellects are dull and undeveloped, with a tendency to a minimum of sound reasoning. In the insane, on the other hand, the tendency is (in addition to a minimum of sound reasoning) a maximum of false and eccentric reasoning, which of all conditions associated with manual labour must assuredly be the most difficult to deal with. It is, therefore, very pleasing to note that at the Colombo Lunatic Asylum about half the vegetables required for the dieting of over 300 patients is supplied by the labours of the inmates, while a handsome return is got as a result of the various forms of industrial work which the different classes of lunatics effect.

The *Evening Despatch*, the evening edition of the *Scotsman*, gives the following racy account of the latest product of Yankee inventiveness:— One of its singular features is that it has cost only 2,000 dols., the amount of an appropriation by Congress to the Forestry Division of the Department of Agriculture "for experiments in the production of rainfall." By means of this sum, it has been ascertained that nature's method of raining on the just and unjust is antiquated, and can be vastly improved upon. In future, all that will be required of the agriculturist will be to set his rain apparatus in order, and go and enjoy himself. There are certain preliminaries, of course, but the Forestry Department of the United States thinks they are of comparatively little consequence, and may be left to the hired boy or orra lad. The first essential thing is to get the clouds together over the dry spot and then blow them up. The precise method is still left in some little doubt, but that is of no great consequence,—the result's the thing. Anyhow, it is accomplished by means of a rain-gun, and an arrangement of electric wires which catch and 'locate' the cloud. The advantages of this will be apparent to the meanest capacity. All agricultural grumbling and writing to the papers will cease, farming will become chiefly a thing of cloud catching, and a new and intensely interesting sport will be devised. After the necessary operations of the day the thrifty farmer will open a gentle rain in the necessary quarter for the night (having previously fired some Paris green into the cloud, for the benefit of the bugs or other insects). The hearts of rural ministers will rejoice at this news. There will be no longer any necessity for their praying for rain, which, when it comes, may prove the salvation of one farmer and the ruin of another. The rain-gun and cloud-catcher will leave nothing to chance, and the ministerial rain doctors will no longer be called upon to address perplexing appeals to Providence.

The medical celebrities assembled at Berlin last August had before them some particulars respecting two alleged discoveries, which, if they stand the test of experiment, may prove to be of inestimable value. One of these is the alleged discovery, by the eminent bacteriologist, Dr

Koch, of a germicide which can destroy the bacillus of tuberculosis. If this discovery prove to be genuine it may well be hailed with feelings similar to those with which the blind man hails the surgical operation which restores him his sight. Tubercular consumption in the human subject has always been regarded as an incurable disease, which condemns thousands every year to a lingering death; and nothing but a change to a very dry climate, in a foreign country, has ever been known to check, even for a time, the progress of this fell disease. Among cattle and poultry, tuberculosis is a deeply-rooted and widely-ramified disease, which slays its tens of thousands every year. The feeling of fear that haunted the public mind on account of the prevalence of this disease was intensified by the confessed impotence of veterinary and medical science to ward off that danger, or even to form an accurate estimate of the extent of that danger. It was known that the disease was hereditary; that it was communicable from man to animals and from animals to man; and that was about all that was known about it. Our "expert" friends were always wrangling with each other as to whether the milk or meat from a tuberculous beast could be safely used as an article of diet; and while the meat inspector tried to guard the public against eating of the tuberculous flesh, no one could ever be sure that the milk he was drinking was not loaded with the germs of this deadly disease. But if Dr. Koch's discovery proves genuine, all this waste of human health and life, and all this loss to dairy farmers and stock breeders in general, will be saved for the time to come. The other discovery is that by M. Roux, and is to the effect that broth made of brewers' grain kills the microbe of Asiatic cholera. Should this discovery also stand the crucial test, it will certainly prove a valuable one too. Medical Science has made vast progress during the last half-century, but these most recent discoveries, if genuine, will prove equal in value to any discoveries that this science has made in the whole course of the Victorian era.

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Leguminosae.

28. *Adenanthera Pavomiana*, L.; Sin. Madetya.

This is a tree growing in the warmer parts of the Island. It attains to large dimensions and has few branches. The bark appears to be of a scaly nature with indentations all throughout. The leaves are compound (pinnate) and are of a light green colour. Like most other leguminaceous trees, the leaves close towards sunset and return to their natural position at daybreak. The flowers are borne in clusters and they are of a whitish colour, especially the stamens, while the calyces are green. The pods are from 3 to 4 inches long and curved to a slight extent. Five to six seeds are found embedded in a somewhat leathery pulp. The seeds are round, convex on both sides, and of a bright red colour. When fresh they are soft, but the dry seeds are hard with a glazed appearance.

This plant is, correctly speaking, not a food-producing one, except in so far as the seeds are sometimes roasted and eaten. The roasted seeds are sometimes sold in the market, but are considered to be heating, producing, as is popularly believed, a defect in the hearing powers of those who eat them.

In India it is said that the dry seeds are worn as ornaments, made into necklets and bracelets. Locally these seeds are used for weighing precious metals and medicines. It is the weight known as a *manchadiya*, and 20 manchadiyas form a *kalan*, the weight of a 1-cent piece; a hundred of these go to form a pound. The almost uniform weight of these seeds makes them suitable for this purpose.

The *Adenanthera* yields a good light-grained timber used for building purposes.

The leaves and bark are locally used for external application in cases of swellings and sprains, and the leaves are said to possess a peculiar property of extracting poison caused by snake bites.

29. *Tamarindus Indicus*, L.; Sin. Siyambala.

This is a large tree growing to a great extent in the warmer parts of Ceylon. The tree attains to very large dimensions, sometimes 20 feet in circumference and nearly 80 feet in height. The stem is erect and much branched towards the top. The leaves are compound (pinnate) with small oblong leaflets arranged in pairs. The flowers which are borne in clusters have white petals dotted purple. The fruits are somewhat cylindrical from three to twelve inches in length, and contain from two to six seeds. The pericarp of the fruits, when ripe, is of a greyish colour, thin and brittle. Previous to ripening they contain a white coloured acid substance, which, when ripe, turns into a brown-coloured soft pulp, which is of a sweetish acid taste.

The seeds are flattish and smooth, and the brown red outer coating is hard and has a glazed appearance.

The young leaves of the tamarind are made into a curry of a rather acid taste, reputed to be a very cooling food.

The pulp of the fruit is used as a condiment generally among the Tamils, and hence it is collected and sold in the bazaars. It is also made into a jam by the addition of a large quantity of sugar.

The ripe pulp mixed with sugar has slightly purgative properties. The kernel of the seed is also sometimes roasted and eaten. As a medicinal plant the tamarind is in high repute among native medical practitioners. The tender leaves are used to reduce inflammation in sore eyes and as a poultice in boils, &c. The seed is employed in toothache and diarrhœa. The timber is used for cabinet work.

30. *Dialeum Ovideum*, L.; Sin. Gal Siyambala.

This is a tree growing in districts north of Kandy at no great elevation. It has lanceolate smooth leaves, and bears panicles of flowers. The epicarp of the fruit has a pretty velvet appearance. The fruit is of an agreeable acid flavour and is sold in bazaars. The timber is strong and handsome, and is used in making ornamental furniture.

LIFE HISTORIES OF INSECTS INJURIOUS TO VEGETATION IN CEYLON. VII.

By Aba.

THE WIREWORM—(Continued.)

Prevention and Remedies.—The only good thing in connection with chena cultivation is that it prevents to a great extent the increase of noxious insects, for in the act of burning a clearing not only are the insects that found harbourage in the trees and shrubs of the jungle, but also the eggs and larvæ of those that are found in the soil are destroyed. To this fact may be attributed the immunity our chena crops have always enjoyed from the attacks of the wireworm and other such insects.

In England it is said that the wireworm does great damage to corn, hops, and other crops, and there is every reason to believe that when we give up chena cultivation and grow our crops on ploughed and manured land, the wireworm will be as troublesome here in Ceylon as in England.

When grass land is newly broken up for cultivation, it is always advisable to adopt some means beforehand to diminish the number of insects and prevent their further increase. This is effected by an application of lime, ashes or any other substance obnoxious to insects. Paring and burning should be practised not only for destroying the grub, but also as a means of getting rid of the weeds and roots of grass that might feed such grubs. The burning of all rubbish on the ground is also recommended. Strips of grass should not be left growing in or at the sides of fields, lest the wireworms feeding in these spread and damage the growing crops.

It is said that wireworms injure and weaken a great deal more than they actually destroy. Therefore it is necessary that such methods of cultivation as will ensure a vigorous growth be adopted, so that the plants may be in a fit condition to use all the available plant food and push forward and get over the attack, without sinking under it as in the case of weak plants.

In England drilling manure with the seed has been found useful. A mixture of guano with superphosphate of lime, drilled with the seed says Miss Ormerod "brought a good crop, whilst the rest of the plants on the field perished by wireworm: in this case wireworm was found between the drills, which seems to point to the safety of the crop being from the dislike of the grubs to the manure, as well as to the increased strength of growth. Dissolved bones drilled with the seed also do good."

Soot applied during rain, so that it may be washed down into the soil, has been found to be useful both in driving away some of the wireworm and stimulating the vigorous growth of the crop. Nitrate of soda and common salt mixed in the proportion of one hundredweight of the former to two of the latter have proved useful.

The following is taken from Miss Ormerod's "Manual of Injurious Insects:"—

"With regard to *mechanical* applications, one of the common remedies used among corn crops is, rolling with a heavy roller so as to solidify the surface and thus prevent the grubs from travelling through the ground. The remedies used amongst root-crops are drill-hoeing and horse-hoeing twice in a place, hand-hoeing close to the rows, and chopping out to stop the progress of the wireworm along the drills; here the object of the treatment is by stirring the soil, to encourage the growth of the plants, and to harass and disturb the wireworm.

"In attack of wireworm on young beds of year-old seedlings of forest-trees, it has been found of use to scrape the earth back from the collars of the young plants to a distance of about six inches, so as to lay bare the larger roots, and hand-pick and destroy the grubs. The roots were then dusted freely with equal parts of lime and fresh dry soot, and fresh soil used to cover them: the old soil being removed and charred, to kill any wireworm that might remain in it."

(To be continued.)

THE LAWS OF CEYLON RELATING TO AGRICULTURE.

(1.) Cattle Trespass, No. 9 of 1876.

I. The word "cattle" when used in this Ordinance means bulls, cows, oxen, heifers, calves and buffaloes.

The word "animal" means except when it is otherwise expressed: cattle, sheep, goats and swine.

The expression "irrigation works" means tanks, bunds, anicuts, sluices, channels and other works used for irrigation purposes.

The expression "duly authorized person" means any person specially or generally authorized to act under the provisions of this Ordinance by the Government Agent for the Province or the Assistant Government Agent of the District wherein such person resides.

II. Any proprietor or occupier of land (or any other person by his direction) may seize, tie up and detain animals trespassing thereon. Such land shall be fenced according to local custom, or may be unfenced if, by the established custom, no fence is required. The detention of such animals shall be until the damage, if any, and the fair expense of their keep (assessed in manner hereinafter stated) shall be paid or recovered.

III. Animals found trespassing on irrigation works may be seized or pursued off the works and seized by any person duly authorized.

IV. The owners of any stray cattle shall in the case of trespass on private lands be liable to pay to the proprietor or occupier, and in the case of trespass on irrigation works to the Government Agent or the Assistant Government Agent the full amount of damages arising by reason of such trespass; and if such trespass was committed in the night time, he shall be further liable to pay to the Crown a fine equal to the amount of the damages awarded.

V. *Procedure.*

(1.) Notice of seizure or trespass shall, with as little delay as possible, be given to some Police Constable or local Headman having jurisdiction in the District. All rights under this Ordinance shall be forfeited if such notice be not duly given.

(2.) Such Constables or Headmen shall thereupon inspect the land and animals, and with three or more respectable persons of the neighbourhood, if available, (otherwise alone) shall (*a*) Ascertain

the owner or owners; (*b*) Assess the amount of damages; (*c*) Furnish a report stating (1), the particulars relating to the nature of the trespass; (2), the names of the owners (if ascertained); (3), the amount of damages; (4), the names of the assessors.

(3.) The Police Constable or Headman shall take charge of the animals if the amount of assessment be not immediately paid.

(4.) Forty-eight hours shall be allowed for such payment of damages and expenses of keep.

(5.) On failure of payment within such time, the proprietor or occupier of the land so trespassed upon shall produce before the Police Court or Village Tribunal the report which, if verified by oath or affirmation in open Court of the Constable or Headman who furnished it, shall be received in evidence.

(6.) Notice shall issue to the owner, which notice, when the owner has been ascertained, shall be served on him or left at his last known place of abode.

(7.) The Court shall then summarily make inquiry and take such evidence as it thinks fit, and if it thinks fit, award the aforesaid damages, charges for keep and penalty to the Crown. Such summary inquiry may be made even without such notice as aforesaid, provided after reasonable inquiry the owner has not been ascertained.

(8.) Twenty-four hours shall be allowed for the payment of such awarded damages, charges and penalty.

(9.) On failure of payment within such time it shall be levied by sale of the animal, and if necessary by distress on the other property of the owner of the animal.

VI. In any case when any trespass shall be proved, whether any damage shall be proved to have been sustained or not, the Court may award a fine not exceeding Five Rupees for each animal. And in case of trespass on private land, the Court may, at its discretion, order a share of such fine, not exceeding one-half, to go to the owner or occupier of the land, the remainder to the Crown.

VII. Even if animals be not seized, yet on proof of trespass, and on notice and procedure as above indicated, the owner shall be liable.

VIII. (1.) All cattle over eighteen months old shall be branded, and the owners shall in the month of January every year furnish the Chief Headman with a correct description of the brand marks.

(2.) Each Headman shall make a return to Government on or before the 1st March every year.

(3.) On default of branding and furnishing such report, the owner shall be liable to a penalty not exceeding twenty-five cents for every head of cattle not branded, and to a penalty not exceeding Two Rupees for every omission to furnish such description.

(4.) The moiety of any penalty shall go to the informer.

(5.) Nothing herein contained shall extend to any Chief Headman's division, which shall be within the operation of the Village Communities Ordinance, 1871.

IX. Any person unlawfully removing cattle detained for trespass, or causing animals to trespass upon the land of others, or driving the animals of others, or conniving at such animals being so driven, upon his own land with intent to take proceedings for cattle trespass, shall be punished by such punishment as a Police Court has jurisdiction to award.

X. (1.) When cattle committing trespass cannot be seized or identified, so that the owners may be ascertained and proceeded against, the Government Agent or Police Magistrate of the District may grant a license to shoot.

(2.) He may also on granting such license appoint a fit person to endeavour to seize or identify the cattle, so that they may be shot only on failure of seizure.

(3.) They may be shot even when driven off the land or irrigation works in the endeavour to seize.

(4.) The license shall be in force only for one month from the date thereof.

(5.) Pigs trespassing may be shot without license, so also elephants and wild buffaloes trespassing on irrigation works.

XI. The carcase of any stray animal shot shall be the property of the owner of such animal, but if the owner cannot be found nor any claim made therefor, it shall be sold by the local Headman, and the proceeds paid to the Kachcheri.

XII. A Police Court or Village Tribunal may impose the full amount of damages or penalty under this Ordinance, notwithstanding that such amount might otherwise be beyond the jurisdiction of such Court or Tribunal.

XIII. This Ordinance shall not affect any common law right in respect of damage sustained by trespass of animals.

H. A. J.

BASIC CINDER.

Basic cinder or slag, known chiefly as Thomas-slag (after the name of one of its inventors) on the Continent, and sold under the name of slag-phosphate-meal, is a manure, the merits of which have been much discussed of late, and one that is gradually coming into favour. Thomas-slag is a substance formed as a bye-product in the manufacture of steel from pig-iron by the "basic" or "Thomas-Gilchrist" process. Steel is a compound chiefly of iron and carbon. It may be made from pig-iron, which is also a compound of iron and carbon, but containing a larger proportion of the latter element than exists in steel. Hence in order to convert pig-iron into steel, a part of the carbon must be oxidized. Besides carbon there are other impurities in pig-iron which must be got rid of, and one of these is phosphorus. A great many iron ores contain phosphorus to an extent which makes them unfit for the manufacture of steel of good quality, and owing to the difficulty which was experienced in ridding the pig-iron of phosphorus, only the purer varieties were used, and steel was a dear commodity. But in 1879 Messrs. Thomas and Gilchrist discovered a method by which the phosphorus could be removed from pig-iron, the result of which was a revolution in the steel trade, and steel came to be much more widely used than it had been before. The new process consisted chiefly in adding lime to the pig-iron, and lining the "converter," in which the iron is heated, with lime instead of bricks composed largely of silica. That is, lime which is a base was used instead of silica—an

anhydrous acid—hence the name "basic" cinder. A blast of air is sent through the iron in the converter, which is raised to a very high temperature for the purpose of oxidizing part of the carbon and other metallic and non-metallic impurities. Among the latter is phosphorus which is oxidized into phosphoric acid. This unites with the lime and forms a kind of phosphate of lime. When the blast ceases, the oxidized impurities together with the phosphate of lime rises as a scum to the top of the converter, and constitutes what is known as basic or Thomas-slag. The slag is tilted into boxes and left to cool, and for some time was cast aside as a refuse material. Many attempts were made to extract the phosphoric acid, but though some succeeded, it was found that the processes could not be worked at a profit. Sometime later it was ground to a fine powder and applied as a manure with much advantage. The phosphate of lime in basic cinder was found to be not the ordinary tri-basic phosphate of lime found in bone and natural mineral phosphates, but a tetra-basic phosphate which contained 224 instead of 168 parts of lime. This compound has an advantage over the normal phosphate to the agriculturist, for owing to the phosphate being supersaturated with lime, the lime and phosphoric acid are in a somewhat feeble state of combination, so that the compound can easily be decomposed by the carbonic acid in the soil, and by the acid juices in the roots of plants. Therefore crops can without difficulty extract the phosphoric acid from the manure. The amount of phosphoric acid will, of course, vary with the amount of phosphorus in the pig-iron,—from 14 to 20 per cent, equal to from 30 to 40 per cent phosphate of lime. Basic slag must be used in the form of an exceedingly fine powder for appreciable effect. It has been found suitable for leguminous crops, turnips, clover, and grass, secondly for cereals; and is well adapted for application to marshy land, stiff clays, and wet land generally, owing to the caustic lime which it supplies. It should be well incorporated with the soil and applied early for effect. No harm is said to result even when applied in large quantities, but 4 to 10 cwt. per acre, according to circumstances, is a fair dose. There is an abundant supply of the substance, which is a valuable manure with a future in store for it if it could be purchased for about R22—R25 per ton ground to an exceedingly fine powder. It should have a guarantee both of fineness and percentage of phosphate.

CRUDE THEORIES REGARDING THE ORIGIN OF CERTAIN PLANTS. III.

By W. A. De Silva.

My subject in this paper is the sweet-potato, *Batatas Edulis* (Sin. Batala). This yam is a common food-product in villages, and ranks perhaps next to rice and kurrakkan in the extent to which it is eaten. The poorer inhabitants of the rural districts live on nothing but this at times, and truly they need have no cause of complaint against the force of circumstances. The original home of the plant is supposed to be America, whence it was evidently introduced at a very early date, as apart from the plant being quite naturalized here, the natives look upon it as an indigenous product. There is, moreover, no such affix as *Rata*, signifying foreign, which characterises a comparatively modern importation, while the fact of its being a subject of folk-lore is sufficient to prove that it has existed for a very long period in the island.

Our story starts with a widow and two daughters who lived together in comfortable circumstances, till the marriage of the two latter, one to a man of wealth, the other to a husband of moderate means. Bad times coming upon the widow, she paid a visit to her rich daughter, hoping to get help from her, but though she arrived faint and hungry, her ungrateful child offered her no refreshment; and even when a request for food was made, the answer was that there was nothing in the house to eat. At first the old woman was inclined to pity her daughter who, she thought, must have become poor like herself, but again she became suspicious of her child's ingratitude, and when the latter left the house for a while, she looked about and discovered that a pot full of rice had been hidden away. Full of sorrow at the thought of her daughter's ingratitude, she wept bitterly, with the result that some of her tears fell into the pot of rice. Then she left, and sought her other child who received her with all hospitality. The ungrateful daughter was pleased on her return to find her mother gone, and proceeded to partake of her meal alone, when, to her astonishment, she found the rice reeking with blood. Such was her punishment for her want of filial affection. But the strange sequel is the important part of this account, for when the bloody meal was thrown away, an unknown plant sprung up from the place whereon it fell, which in course of time developed a tuber to which was given the name Batala, derived from *Bata* rice, and *la* blood—an unpleasant enough etymology for so estimable a food.

BUILDING MATERIALS.

Section 1. Stone.

By a Factory Apprentice.

The names of the various sorts of stones are derived either from the places where they are quarried, or from the substances which principally enter into their composition. The term "Freestone" is, as its name implies, that sort which can be wrought with the mallet and chisel or cut with the saw, an operation which cannot be performed on granite, whose hardness requires it to be dressed with pointed tools of different weights and sizes. It includes the two great divisions of Limestone and Sandstone.

Hardness, tenacity and compactness are the three chief qualities requisite for a building stone. It is not the hardest stone which has got the greatest tenacity or toughness, for limestone, though much softer, is not so easily broken as glass.

Nearly the same causes, which destroy the rocks on the surface of the globe, accelerate the *decay and destruction* of stone. Such causes are of two kinds, those of decomposition, and those of disintegration. The former effects a chemical change in the stone itself, the later a mechanical

division and separation of the parts. The effects of the chemical and mechanical causes of the decomposition of stone in buildings are according to their situation, as in the town or country. In populous and smoky towns the state of the atmosphere accelerates decomposition more than in those placed in the open country.

A great advantage which a country building appears to possess over a building situated in a populous and smoky town, is owing to lichens, with which the country building is almost invariably covered, and which seem to exercise a protective influence against the ordinary causes of the decomposition of the stone upon which they grow.

Mineralogists and Geologists enumerate a great variety of stones, but the Architect and Engineer recognise but three great divisions, known as "Freestone, Slabstone, and Rubblestone."

Freestone.—The name of this stone is derived from the freedom with which it is worked, one of its leading characteristics is, that though durable against weather, it is yet soft enough to be worked with the mallet and chisel. It is therefore particularly valuable for purposes, such as columns and their capitals, cornice, frieze and mouldings, or for the building of walls, where external surfaces are desired. The following are the different varieties of Freestones:—

1. *Marble* is one of the primitive limestones, being a carbonate of lime, and when pure is perfectly white. On account of its durability, its non-absorption of water, the ease with which it is worked and the high polish it takes, it ranks first amongst the freestones.

2. *Alabaster* is a fine white stone resembling statuary marble; it is a sulphate instead of a carbonate of lime, therefore not a marble, being very brittle and not durable in the open air is used for interior ornamental purposes.

3. *White Sandstone,* next to marble in point of grain and durability, is the fine white sandstone, which is composed of a fine silicious sand held together by a peculiar natural cement, so fine that it cannot be perceived between the grains. It bears fine carving, is strong and durable, and not affected by the weather.

4. The *Oolite,* so called from its resemblance to the roe of a fish, is of a yellowish white colour, its grains vary from the fineness of sand to the size of peas, united by a natural cement quite visible to the naked eye, it is very soft at first but hardens from exposure. It is used for building purposes solely on account of its fine grains.

5. The *Ferruginous or Red Sandstone* consists of a coarse silicious sand, cemented by an oxide of iron. This stone likewise acquires hardness by exposure to the open air; it is well adapted for bridge building, especially in arches of large span.

6. *Soapstone* will stand great heat, and is therefore applicable for fire places and chimney pieces, &c., but is too soft for building with.

7. *Granite* ranks amongst the most hard and durable stones. It bids defiance to the saw and almost to the chisel, but still it can be worked, with expense, to any form, to a fair but not a smooth surface.

Slabstone is of a character which splits into parallel plates; it possesses great strength in the direction of its laminæ. This stone must always be used with its natural joints in a horizontal position. It is especially used for flooring and covering of roofs, or in the foundation of extensive buildings, as being flat and affording equal pressure on a large surface of ground.

Rubblestone is of a character which splits into from their hardness cannot be sawn, and from their brittleness and irregularity of grain resist all attempts to reduce them to regular shapes, save by very expensive processes. These stones are only used for rough work in foundations, or filling in walls of more than ordinary thickness, backing and strengthening them in parts not exposed to view.

(To be continued).

THE GARDEN SPIDER.

The Spider belongs to the class Arachnida of the sub-kingdom Annulosa. The true spiders (Araneida) is distinguishable as having no true antennæ, and the head and thorax amalgamated into a "cephalothorax." The spider after birth undergoes no transformation, and merely increases in size, though it changes its skin repeatedly before attaining maturity.

The web of the Garden Spider, though very wonderful in construction, is so familiar that a description of it would be superfluous. The material of which the web is made is the secretion of a special gland, and it is moulded to its proper shape by being passed through certain conical little organs which are placed at the extremity of the abdomen, and are termed the "spinnerets." The apex of each spinneret is perforated by a large number of little holes. The silk is at first fluid, but hardens rapidly on exposure to air. A single filament of silk is thus produced by each of the perforations in the spinneret, so that what is called a single "thread" in a spider's web is really a cable, composed of a great number of the most delicate fibres agglutinated together. The webs of the Garden Spider are almost always spun between the leaves of a plant or in the space between two or three plants situated in close proximity. The elasticity and strength of the material of the web is proved by the fact that it is uninjured by a strong breeze. Should a thread be broken by a violent gust of wind or some other unlooked-for accident, the spider effects the necessary repair almost immediately. By a singular instinct the spider prevents the web from being unduly stretched with the chance of snapping, by hanging pieces of wood or pebble to give it weight. The spaces in the web contains a sticky substance which is intended to entrap insects by their legs or wings. The spider kills its prey not by a sting like that of the scorpion, but by a pair of strong hooked jaws (poison jaws) which have their points perforated for the escape of a poisonous fluid secreted by special glands. As is generally known all spiders are carnivorous, but the point of interest about the Garden Spider is that the flies and insects it captures and kills are nearly all injurious to vegetation. Langsdorf goes the length of saying that *Mygale avicularia,* a Garden Spider, only eats insects injurious to vegetation! At any rate there seems sufficient reason for

believing that the Garden Spider is a friend rather than an enemy to the agriculturist, and as such should be treated with due mercy.

V. Kumaravelu.

GENERAL ITEMS.

The strawsonizer, apart from its value as a distributor of manure and seed, has proved a most effectual means of keeping off insects from certain crops by the perfect way in which it distributes insecticides. Already it has been found that paraffin oil, as sprayed by this machine, is a specific for the turnip fly pest, and now it is coming to be recognised that the strawsonizer may be effectually used for combatting the potato disease fungus. This latter use of the machine opens up a field of the widest possibilities.

Great distress must be anticipated if, as is reported from Cairo, 9,000 acres of rice and cotton have been entirely destroyed, in the province of Garbieh, by an inflow of salt water.

The *Indian Agriculturist* notes that of the eleven Indian students who have since 1880 studied agriculture in England, only two have adopted an independent line of employment, and one is engaged on enquiries on sericulture, the rest holding appointments in no way connected with agriculture; and suggests that these men should be utilized by the Government for taking charge of Crown lands which are in the hands of those who have no special knowledge of agriculture, so that the interests of the Government may be better looked after than they are.

The taste for agricultural education is evidently spreading. We lately referred to the forming of an agricultural department in Egypt, and now the news reaches us that the Government of Monte Video have resolved to found a Superior School of Agriculture and National Stock Farm, and with that view have set apart a large tract of land at Toledo. In the school theoretical and practical education to qualify students for the title of agricultural expert *(perito agronomo)* will be given.

The Kandesh Experimental Farm in India is said to have given most satisfactory results during 1889-90. Full details of the cost of cultivation have been published, and the following (in Ceylon currency) shows the profit per acre in the case of some of the crops cultivated: Cotton, R12·86; Wheat, R14·80; Sesamum, R5·52; Linseed, R4·85; Rice, R7·00 and Sugar-cane R32·82. The profit per acre on all crops cultivated amounts to R10·66.

According to the British Vice-Consul, at Athens, the Greeks do not show any great aptitude for agriculture, though they are eminently adapted for trade and speculation. The rural districts are thinly populated—cultivation being mainly confined to fruits and vegetables.

Some of the natives of India are said to use, as a substitute for coffee, the beans of the yellow wattle (Tamil *Thumba Chedi)* after roasting them, and in some cases mixing with roasted rice.

A flower is reported to have been discovered in the Isthmus of Tehuantepec which in the morning is white, at noon red, and in the evening blue, and only gives out a perfume at mid-day.

The following subjects were treated of and discussed at meetings of the Agricultural Improvement Society held at the School of Agriculture during the past month. "The Relation of Geology to Agriculture," "The Improvement of Dairying in Ceylon," and "The Need of Technical Education in Ceylon."

The August number of the "Agricultural Gazette" of New South Wales to hand consists of an exhaustive report on the Pylenchus worm. The Minister of Agriculture lately announced that he has completed a scheme of education and has secured qualified men to instruct students in the various branches of agriculture. A library and museum are also being formed for the instruction of the students.

The International Congress of Forestry and Agriculture in Vienna was opened on September 1st. The members of the Congress numbered nearly 900, delegates being present from Great Britain, France, Belgium, Denmark, Italy, Germany, the Netherlands, Norway, Russia, Roumania, Servia, Sweden, Switzerland, Australia, India, Brazil, and Japan.

THE

TROPICAL AGRICULTURIST MONTHLY.

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"THE MAN AND THE ANT."

THE above title is not intended as a plagiarism on our old friend Æsop. I is meant only to indicate the warfare which has raged from time immemorial between the most intelligent of mammals and almost the smallest—albeit the most highly gifted as to mental power—of the insect tribe. In that warfare man, with all his great gifts of intellect and his vastly superior strength, has been heavily worsted by his relatively insignificant opponent. There are few of us, we imagine, who can fail to share Sir John Lubbock's appreciation of the extraordinary capacity of our tiresome little enemies, for as such we are certainly justified in classing the ant tribe. It is unfortunately the case that in all tropical countries—and in none more so, we should say, than in Ceylon—the opportunities for observing and for appreciating,—after a left-handed fashion,—the qualities of the ant are particularly and regrettably wide. They invade our meat safes, they disturb us in our beds and even extort cries of pain from us when met with in their jungle habitats, and they cap all their aggressions upon their human foes by eating our houses over our very heads. Truthfully may it be said that hitherto no adequate, inexpensive remedyas b een devised by which the balance of advantages now so largely in favour of the ant may be redressed in our favour. In spite of all attempts, of the many suggestions which have been put forward, the little insignificant-looking insect continues master of the situation, and daily, in one form or other, makes us feel his power. Has not the so-called ant of the white epidermis almost succeeded in eating a whole Colony—that of St. Helena—practically out of house and home, and rendered it at one time a matter of serious consideration whether it would be practicable for Great Britain to remain the tenant of that isolated island! We know that the ravages of the white-ant not many years ago, did render such an evacuation within the "range of practical politics," and all methods of treatment tried in other Colonies have failed to keep under this ravaging little intruder on domestic comfort.

We are, therefore, inclined not altogether to pooh-pooh a suggestion offered to us as to a possible method of largely exterminating these little pests which has at least, so far as we know, the recommendation of novelty. It is known that a low range of temperature is as fatal to insect life as a higher range is to its production and maintenance. The numbers in which ants swarm, and the extent of their wonderful subterranean galleries, render it most difficult to reduce their numbers. To get at the "Queen Ant" without the destruction of which all efforts at exterminating are fruitless, is a work often of great labour, and very frequently is wholly unsuccessful. Chemical solutions, to be used in the large quantities necessary, are costly and sometimes difficult of application. Well, it is now suggested to us that we might *freeze* our foes out of existence in the neighbourhood of our dwellings! We have heard how quicksands are now passed through, in excavations, by the use of freezing mixtures which suffice to turn the moisture of large cubes of soil into solid blocks of ice. The idea now is that a cask of such freezing mixture should be fixed over the main entrance to an ants' nest—the others being closed up with clay, as they become apparent—and that a tube from it should be placed into the hole and also well "luted" with clay. The pressure due to the head of liquid in the cask would suffice to drive the freezing mixture into the inmost recesses of the galleries, and these, it is expected, would almost instantly become lined with solid ice, or at all events would have such intense cold produced in them that no ant, however tenacious of life, could long survive exposure to it. Such freezing mixtures are, we are told, exceedingly cheap—they could not otherwise be used on the large scale they now are in engineering operations—and it may be found that the progress of science in the latter part of the nineteenth century has achieved a victory for which so many past generations have contended though in vain.

WATER IN LANDSCAPE GARDENING.

From an article so headed in the American periodical *Garden and Forest* we quote a passage, which we commend to the notice of those responsible for the upkeep of the pretty grove and sward in "Victoria Park" in which the Band of the Volunteers plays once a week. The fountains in the "Gordon Gardens" prove how greatly water in motion adds to the attraction of a pleasure ground. A nice fountain and fernery with a *Victoria regia* tank would give fresh beauty to a spot already beautiful in "Victoria Park." The amount of water required would not be large; and much of it, by proper arrangement, could be used over and over again. Daniel D. Slade writes:—

"Where the supply is limited, a weeping fountain' which consists of an upper basin into which the water is brought with just sufficient volume to overflow on every side into a large basin below, is perhaps to be preferred. By carrying the pipe to a level with the outer edge of the upper basin the water may be thrown a little above the surface in a jet, or it may be allowed to boil up in the basin. In material and design such a fountain may be infinitely varied. An inexpensive arrangement was carried out in this way. The vase, or upper basin, was formed of an irregular shaped block of freestone, nearly circular and some three feet in diameter. This was supported upon three blocks of the same kinds of stone placed with apparent carelessness one upon the other, the lowest resting in the centre of a lower basin, which was circular and some five feet in diameter. The blocks were drilled for the passage of the conduit pipe and the whole was rough-hammered. The spray of the water which dripped from the upper basin quite sufficed to moisten the ferns and aquatic plants set about its base and the colour of the freestone was quite in harmony with its surroundings."

CEYLON UPCOUNTRY PLANTING REPORT.

THE WEATHER AND PLANTERS' WARDROBES—THE 'TROPICAL AGRICULTURIST"—A NEW DEPARTURE—PRICES FOR CACAO AND CACAO CROPS—COFFEE—TEA—LABOUR.

September 15th.

The continuous rain we are having is rather monstrous, and is trying the capabilities of the planter's wardrobe. The wet clothes accumulate; for the green firewood in the kitchen—and whoever saw any other kind than green firewood in wet weather—can't keep up with the armfuls of splashing "duds" that require to be dried and which are handed back in the morning, warm but moist, and decidedly redolent of wood smoke. With rain night and day, even a good stock of clothes soon gets all wet, and it was not a matter of any surprise to me when I heard that in one district the indoor rig of the planter is at present the dress suit! To the stranger visiting, this style of things would give an idea of there being a high standard of civilization abroad, and doubtless there is; but that it should blossom at this time, and so generally, would be puzzling to account for, but for the weather. All the same: a planter with a healthy appetite does not mind much even if he has a swallow-tailed coat on at breakfast, and sits down to his solitary dinner in full evening dress.

The *Tropical Agriculturist*, which keeps up its character as a practical and thoroughly useful planter's magazine, is certainly improved by having had of late its edges cut at the publishing office, instead of leaving that to the reader. It is a small matter of course, but it is a comfort all the same. It stumps the critic who only cuts a page or two, smells his paper-knife, and then proceeds to review! Besides this it is evident that the publishers keep abreast of the times, and in small matters as in great are bent in doing all they can for their readers.

The September number, which is before me, is as full of information as any of its predecessors, and the sweep of the editorial net is about as extensive as it possibly can be. Except that it would take up too much space, I would like to jot down all the sources from which the information in its pages have been drawn. To do this one would have to begin with *Punch* and the London *Times*, and end up with the *Japan Weekly Mail*.

Cacao planters, who have of late been realizing the handsome figures of 110s to 115s for their produce, do not quite appreciate the decline in rates, albeit 100s per cwt. for "bright bold" is still a very good price. I am told from home that the absence of American buyers from the market is one of the reasons for the fall, and the big gap between the West Indians and our own is perhaps another. Cacao, too has better prices in the winter months, somehow, than obtains at other parts of the year; so it is to be hoped that ere the bulk of the crop goes home prices may strengthen. I do not know of any produce in the island which has its gingerbread so thickly gilt as a good cacao garden: but that makes it all the harder to bear when some of it comes to be rubbed off. It is like the widow and her mite; where one is so "down on his luck" as *that*, to part with the coin is easy; the difficulties and trials come in when you have more.

Cacao is looking wonderfully well, and all that I have seen promises a decent crop. Already fair gatherings of pods are to be had, but better tasks will be selected later on. The Moormen who were so anxious a few months ago, to buy up any black rubbish in the shape of cacao that could be got are "easing off" and want now to be tempted. Perhaps their little game of improving the colour by means of the annatto dye may be played out, and they may be considering what next honest employment to turn to.

There is a sprinkling of ripe coffee about, which will need a good price for its parchment to pay for the gathering. "Still, there is more to follow"; and the trees seem as if they would run through the season, and not be very much the worse of it at the end. A nursery of Coorg coffee which I saw the other day, had come up very well, but there was leaf-disease on it pretty bad, although it might have been worse.

A good deal of tea is cut down just now, and the flushing is nothing to boast of. Some of the districts which are cold and wet are anxiously waiting for the genial sunshine, which has not been seen since June or July, so as to encourage the flush and put life into the coolies. The tea-house working at half time is never a very paying concern, and a good many have of late had to be content with that.

Coolies are sufficient, and more, for the planter's wants, and seem rather to enjoy a short time of enforced idleness. If Ramaswamy has been working steadily before, he is like a man who has lost his sleep, and has a good deal of resting to make up. That he does with pleasure, and both the planter and cooly are content.

PEPPERCORN.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F. L. S., F. G. S., &c., EDITOR OF "SCIENCE GOSSIP."

A French chemist, M. Aimé Girard, has drawn special attention to the employment of copper salts as a remedy for the potato disease. The notion is not new, for Dr. Griffiths published his own experi-

ments with both copper and iron salts as a manurial remedy for the same diseases, and the fungoid diseases of cultivated plants generally, nearly two years ago. M. Girard, however, shows that a solution of sulphate of copper used as a preventive of the potato disease is not only very efficacious, but that it results in a gain to the crop such as more than pays for the expenses of the treatment. Even when used as a purely curative agent, he says the yield of healthy potatoes is increased from between twenty to twenty-three per cent.

It has been found that when leaves, or rather plants, are grown in unhealthy situations, such as where there is a deficiency of light or nutriment, the green chlorophyll becomes degraded in its functions, and assumes another colour indicative of this fact. The commonest of the degraded colours of leaves is some high tone of yellow. This is due to the presence in the cells of carrotene, instead of chlorophyil. Moreover, our orange and deep yellow autumn tints are due to the change of the latter into the former.

Somebody spoke of the present as the "age of iron," until a recent writer termed it the "age of steel." But wood is not yet disused, although as regards house-building it is no longer an "age of timber," builders having discovered with how small a quantity of wood a house can be built. But wood is not timber, although many people confound the two. Tree ferns and palm trees have large woody stems, but nobody uses them as timber. They would rot directly.* The simple structural forms of timber are coniferous trees, such as larch, pine, &c. They possess the loosest tissues, which soonest decompose (in spite of their natural turpentine), and consequently are much employed under certain conditions. In them the woody bundles run the length of the stem, and produce "grain;" but we do not find in the structure of such timber the horizontal bars of wood we see in a section of oak, ash, beech, &c. The real timber trees were those used by our forefathers in the old-fashioned houses, built when real timber was as abundant as "wood," so they helped themselves to it, as the beams and rafters of our old houses prove. The oak and ash and other real "timber trees" are built up naturally into a solid woven fabric, consisting of vessels and woody bundles running lengthways of the trees, whilst such extra additions as the "medullary rays" (absent in cone-bearing trees) are interwoven into them from the core to the bark. Generally they increase at the rate of one added ring of growth per annum, but this is not necessarily so, especially in young "timber trees," in which the rings represent merely a fresh spurt of growth, annual or otherwise The seasons are now known to exercise a wonderful influence upon the nature of the rings of woody growth added in the older timber trees annually. We have dry summers and wet ones. Nobody can prophesy (until afterwards) which will be the case. It is only in summer, when the leaves are crowding the trees, that the timber of the woody trunk can grow exogenously. Therefore it is evident the nature of that growth must largely depend on the character of the season. One of the worst things which can happen to wood (considered as "timber") is when there has been a succession of dry seasons followed by wet ones. During the latter the tree forms what is known as "weak wood"—so weak, that not unfrequently, as the growth progresses outwardly, it is detached at the weak part of the ring from the previous growths. This is technically known as a "ring-shake." Coniferous trees can grow on scanty soils. They are the oldest trees in the world, geologically speaking, and are used to the poor soils of a primeval world. Oaks, beeches, ashes, &c., are among the latest introduced of trees. They cannot live on a vegetable pauper diet, but require the rich subsoils of the latest geological formations—clay, marl &c.

* Dr. Taylor had in view the general run of palms. There is no better timber for rafters and reepers of house roofs than that of the palmyra palm, while selected coconut trees are good for similar purposes. —ED. *T. A.*

It is a well-known fact that the more we cultivate any particular crop the greater is the number of diseases to which the latter becomes liable. Is it due to overcrowding—to increasing the individual plants we denominate a "crop"? The potato disease was hardly known until Ireland scarcely grew anything else but potatoes. Vine diseases (animal and vegetable) have accumulated with extended vineyard planting. It is the same with orchards, olive-yards, orange-groves, &c. The cultivation of oranges all over the warm temperate parts of the world has mightily increased within the last few years. People have learned to love them, and increased transit has brought the producer and consumer nearer together. Oranges are no longer the sole luxury of the rich, and the objects of envious desire to the sick poor. But with increased cultivation have come increased diseases to the fruit. They are attacked by blue and green moulds, which destroy nearly half the quantity that arrives in Great Britain. They are also subject to extensive ravages by a peculiar species of small fly, whose pupa-cases may be seen embedded in the outer skin of most oranges by thousands, looking like so many carraway seeds. The name of this minute insect is *Ceratitis citriperda*. Recently another entomological enemy to the orange tree has been discovered in the larva of a beetle (*Cerambyx meles*), which bores into the lower part of the stem and down into the roots. This grub seems to be either identical with, or nearly allied to, the *Cossus* of the ancient Romans A species of *Praya* has also this year been found feeding in the buds of orange and lemon trees in the south of Europe. Let Australian orange-growers, therefore be on the look-out for this new arrival of enemies.

Microscopy has done a good deal for practical and technical science, and it promises to do a good deal more in the future. An interesting paper has just been read before the French Photographic Society on microscopic sections of wood. The French Inspector of Forests pointed out that such photographs permit the trees which furnish the woods to be classified, owing to the microscope bringing out the structure of the cells and fibres, so that thin cuttings of any wood can be compared with standard photographs so as to enable them to be identified at once.

Messieurs Gayon and Dubourg have been exploring the mysteries connected with the important subject of the alcoholic fermentation of inverted sugar, and have laid the results before the French Academy of Sciences. In brief, the following are the conclusions they arrived at. They followed the progress of the fermentation by means of the polarimeter, and they prove that the two components of invert sugar are attacked with different degrees of rapidity, and that different ferments do not act in the same manner; some attack the lævulose by preference, and others the remaining componen

At the risk of repeating what you may have already heard of, I do not hesitate to give the following important bit of news connected with the banana plantations. The discovery was made accidentally in Fiji—the paradise for Australian bananas. There can be little doubt the discovery will prove valuable in all tropical countries where bananas are cultivated.

The banana disease had broken out virulently on a plantation at Vanua Levu. Near the seashore a banana patch was very much diseased. Some time ago the sea broke over into it, the salt water remaining there for about an hour. All the plants were killed as far as the standing stems were concerned; but vigorous young shoots came up freely from the roots, and were not only quite free from disease, but soon began to bear much larger bunches of fruit than the parent plants ever did. The planters noticed this effect, and immediately tried an experiment upon a number of diseased bananas which the water had not reached. They cut down the diseased plants, stirred the ground about them, and then poured three or four buckets of sea-water about each plant. The parent stems withered, but vigorous young shoots sprouted in their place without a sign of disease.

The question of a scientific investigation into the aeration of soils must commend itself to all agricul-

turists. The French chemists have long been to the front in the investigation of matters of this kind, although their English brethren are fast overtaking them. M. Schloesing has been experimenting in the matter, and has recently made known his results. He shows that ploughed land contains a relatively larger amount of oxygen to a certain depth. The carbonic acid generally increases with the depth, but in two cases the reverse occurred. This was when a high wind renovating the upper soil had been followed by hot and calm weather. Then more carbonic acid gas was generated in the surface soil than in the subsoils. In sloping pastures the most carbonic acid gas was found at the bottom.

At the recent annual meeting of the Society of Americon Microscopists an interesting paper was read by Dr. Thomas Taylor, on the adulteration of tea. Can any philospher in the world explain why a man's drinks should be more liable to adulteration than his solids? Perhaps it is because he takes more of them. Therefore, both drinkers, and teetotallers, are hereby liable to the same imposition. Dr. Taylor showed how Japanese teas are "faked" to resemble the Chinese green teas, the materials used in the process being indigo and plaster of Paris. It so happens that this is the kind of tea the Yankees prefer. Neither of the adulterants is harmful, only there is no necessity to drink tea with any other adulterants than cream and sugar. The Japanese are a wise people, and by them coloured tea is regarded as an abomination. He taught that a return of the consumers of teas to Japanese habits would certainly result in the preparation of the tea-leaves in Japan, and would thus afford cutomers better teas at lower prices.

At Keswick, in our well-known lake district, there is now taking place the first essay in England to utilise natural water power of the hills for the purpose of public electric lighting. The river Greta supplies the motive power. About three-quarters of a mile from Keswick town it has a head of twenty feet, and this has been selected as the site for the works. The light has been received with much favour, and already the demand is equal to the supply. One man and a boy have been found sufficient to manage the machinery.

The oil wells at Baku, at the Caspian, are said to be drying up again. Out of four hundred wells less than two hundred are now working. This may cause much incovenience to the Russian navy on the Caspian, many of whose vessels have been specially fitted up to consume petroleum. If the world's supply of coal is limited, and will only last a certain time, it is very certain its mineral oils are more limited, and will be exhausted in a much shorter period. The craze for oil-well boring cannot be too carefully watched.

Another well-known French chemist, M. Muntz, has published his experiences on the part taken up by green manures as nitrogenous dressing for soils. His experiments show that the efficacy of green manures as nitrogenous dressing materials depends especially on the facility with which the fresh vegetable matters allow the nitrification of the proteids, and on the favourable influence they exercise on the physicial properties of soils.

A singular confirmation of the theory that certain kinds of insects have become specialised to visit certain kinds of flowers or rather that the latter have been specially adapted to the former, has just been proved by a German botanist. The highest organised and specialised of the numerous members of the buttercup family (Ranunculaceæ) is the aconite. On the other hand, it is granted that the bees are, perhaps, the most highly cerebrated of insects, and know their way about. It has been shown there is a biological relationship between the aconite (Aconitum) and a genus of bees (Bombus). The aconite is dependent upon this bee for fertilisation. On comparing the geographical area of the two it has been found that the area occupied by Aconitum is entirely covered by the area of distribution of Bombus.

You in Australia know what it is to disturb nature's zoological balance by your rabbit pest. They are suffering from a similar disturbance in the Southern States of America. The alligators have nearly all been killed off for the sake of their hides, which are manufactured into a special kind of leather. It seems the alligators are the specific foes of the musk-rats, which have multiplied accordingly since the almost complete extermination o their natural enemies, insomuch they are now a great scourge to the farmers in Louisiana and elsewhere. The consequence is that a fine of 24d. is now imposed upon any one who shall slay an alligator.—*Australasian.*

A TEA PLANTER'S ROMANCE.

In "The Dead Man's Gift: A Tea Planter's Romance," just published by Messrs. W. H. Allen & Co., Mr. Herbert Compton has written a capital Anglo-Indian novel, dealing with a phase of English life out here that has scarcely been attempted before. The plot is ingenious and exciting, the scenery is admirably described, and the characters are wonderfully lifelike. With the plot we need scarcely concern ourselves here; it will be enough to know that a very pretty love story and an atrocious scheme of commercial villany are gradually revealed in a novel and picturesque frame-work of Himalayan scenery. The interest of the book from our point of view lies rather in its characters, vivid enough to be transcripts of actual individuals, and in its faithful, unvarnished descriptions of tea-planting life. Dennis Durand, the central Tea Planter of Mr. Compton's romance, is a frank, straight-forward young University man, who after having had a good time at home invested what he had left, some four thousand pounds, in a tea garden at Dulgoorie (for which perhaps Darjeeling may be read), and then proceeded to learn the business. A kindly neighbour, old Pekoe Puckle, fortunately took him in hand. When Puckle first came to Dulgoorie, the process of tea manufacture was a Mystery tempered with Ignorance. The manufacture of the leaf was in the hands of a few Chinese charlatans, who had been imported from the Flowery Land, and distributed over the new tea districts to disseminate a knowledge of their reputed craft. They concealed their ignorance under a cloak of pride and impenetrability, and did all their work in carefully secluded corners. Puckle put them down as gigantic humbugs, and evolved a process of his own that gave his teas a very profitable price. Unlike most of the old-fashioned tea-planters, he was always ready to give everyone the benefit of his experience:—"The sooner we can all make good stuff," he would argue, "the sooner we shall sweep the rubbish from China out of the market. It's bound to go if we pull together." Strolling for five minutes through a friend's factory, he would point out all the errors and mistakes he noticed, and rectify them at once. The smell, the colour, the look, the touch, the feel of the leaves in the process of manufacture told him everything at a glance:—"In short, he was a Tea Expert." Things, we are told, have altered since those remote times when the sixties were young:—"Everything is done by machinery in a tea factory nowadays, and Puckle's tea-house operations slowly and laboriously, and it is to be feared dirtily, performed by hand by a large staff of specially drilled coolies, can now be conducted by half a dozen intelligent men in charge of a variety of withering, rolling, drying, and sifting machines and with a facility and precision and cleanliness which would crumple up some of the old dead-and-gone pioneers of the industry, if they could rise from their graves to resume temporary management of their factories." "Don't imagine, Durand," Puckle would often say, "that any fool is fit for a tea-planter; that is an exploded idea now amongst men of business, who know what tea-planting really is. You want more wits and versatility in our profession than in most. You must not only be Jack of many trades, but master of them. The programme for a successful season is a big order for any one to buckle down to." We are pilfering wilfully from Mr. Compton's volume, as the

best way of showing its excellence, and, indeed, it would be easy to fill a column or two with the apt things he says of that famous expert Pekoe Puckle.

Puckle, we are told, was a capital tea-taster, with a fine vocabulary of technical expletives and adjectives. Thus the samples on which be pronounced came to be described as "handsome, curly, glazed, bright, black, wiry, glossy, even, regular, tippy, and curious in appearance; whilst their drinking qualities were reported on as strong, flavoury. full, rich, ripe, brisk, fruity, thick, fine, creamy, pungent, malty, sweet, good, high-fired, brisk, burnt, rasping, desirable, clean, and superfine. But others would occasionally disgrace themselves and sink into the turpitude of being dull, broken, dusty, flat, choppy, chaffy, uneven, crapey, mixed, round, shotty, stalky, grey, red, brown, greenish, dull, black, and tipless in leaf; whilst in liquor they were branded as soft, weak, burnt, scorched, coarse, thin, extra thin, undesirable, wanting flavour, wanting quality, wanting briskness, bakey, toasty, poor, and bad." In sad contrast to Pekoe Puckle we have Jack Boyce, an Oxford Man and old Etonian:—"He's the kindest-hearted man in Dulgoorie, and the weakest in a way. He has run through a fortune and has one foot in the grave, and yet he passes his life in keeping open house for the district and passing the bottle round. It is the old story, of course, lifting his little finger too often." His bungalow was popularly known as the *Red Lion*, and was open night and day "of man and beast." Durand tried to rescue him from the toadies and harpies who flattered his failings and used his house as an hostelry, and was, as a consequence, sent to Coventry by the planting community as a body. Boyce came, of course, to "the six-by-two freehold in the planters' churchyard;" and with his pathetic death the better men among the Dulgoorie planters began to respect the energy, independence and character displayed by young Durand in his single-handed combat against the evil influences of the district. His warmest supporter was a half-pay lieutenant of the old Indian Navy—Lieutenant Marling, a quaint, crabbed, old salt, who wasted his half-pay in trying to grow tea so bad that even the tobacconists would no buy it for packing cheroots in. Durand came across the Lieutenant first, as the old man, in a voice broken with sobs, was reading the Burial Service on a grave dug in the middle of a grim, fantastic landslip:—"Do you know," asked the Lieutenant, "can you guess over whom I read the funeral service just now?" "No." "Then I'll tell you, for it's my duty. It was over a native woman. A heathen, if you will, but my wife, Sir—before Heaven my wife—even though she and I were never married. Perhaps"—he went on in a softer tone—"perhaps I have done wrong. Maybe I have led you into an act which is against your religious principles. She had no right, a parson might say, to the services of the Christian Church, even though she prayed to the Christian's God. I say she had. But, then, I loved her. And believe me, Sir, I meant no harm." This strange meeting led to a singularly devoted friendship. Lieutenant Marling is so happily conceived that we feel quite sorry when his eccentricities are, however amusingly, exaggerated; as, for instance, when Durand recognized the familiar voice of the Lieutenant outside his bungalow:—"Starboard you Lubbers!" Then after a few seconds—"Port your hellum—hard-a-port!" They had reached the bungalow. "B'lay! B'lay! Easy! Stand by!" And finally—"Le' go!" alluding doubtless to an anchor. "Le' go" they did—a trifle too promptly. "Darn the lubbers!" roared a crushed voice from within, as a movement in the canvas ceiling of the palanquin was suggestive of a head being unexpectedly shot into it from below. "Darn the lubbers! She's gone aground!"

Lieutenant Marling's funeral service, however pathetic, hints at something amiss in the tea-planters' little circle:—"The greatest drawback of all," we read, "in a tea-planting community in those days was the want of woman's presence and influence, and it lowered the whole standard of morality and refinement, and made the school a bad one for a young man to enter, and full of vicious temptations to which many a lad, just out from home and a refined family circle, yielded, and so went to the bad." The ladies of Dulgoorie in those days were a mixed lot:—"Some were civil without being attractive, and one or two went in for being very superior; whilst others dropped their 'h's,' or wore loud colours, or drove niggers, or did divers things which individualised them unpleasantly, so that in their presence Durand had asserted himself, because he felt that to be shy before them was a sort of surrender of his social status. And then they all talked TEA." Durand happily, and almost by accident, stumbled across a most bewitching little lady, Sibyl Adair, as she was giving her brothers, Isaac Newton and Colenso, their morning lesson. Her father, Mr. Lionel Adair, had been a mathematical tutor at Cambridge, and had had a mathematical bee in his bonnet ever since:—"I am engaged," commenced Mr. Adair, "in a work of Considerable Depth. A Treatise on the Higher Mathematics. It is an Absorbing Task." He might have said it was a Screaming Farce, if it were not that this wretched Work that was to be, had ruined the whole family. When Mr. Adair went to look round the factory he would take up the lid of a tea chest, and work out problems on it with a piece of charcoal; and if he went into the Plantation to inspect the coolies, he would sit down on the first convenient bank and sum out something on the back of an envelope:—"No wonder that the men were getting idle and lazy, and that the fat Jemedar, or native overseer, was nothing more or less than the master of the estate instead of its servant." And the tea sold badly, and there was so little of it, and it was stolen right and left. Little Miss Sibyl—she was barely seventeen—had the cares of a large family on her hands, and did a good deal, too, to prevent the tea-garden going to the dogs. Durand sympathized with her struggles offhand:—"Oh, Mr. Durand," she exclaimed, "you don't know what you are saying! Papa will never leave this place. He is getting deeper and deeper in his Work every year, and has not the slightest inclination for change. When Mamma was alive she made him come out of his shell, but since she died he has had it all his own way with those—those—those *beastly* mathematics!" Of course, these two inexperienced young people fell in love with one another at once, and their chequered love-story is told tenderly and very prettily. It is in its way a delightfully bashful and idyllic incident. The subsidiary characters are as good and true to life as those we have picked out. Captain Goad a bully and a coward, who swaggers on his title, talks of the "Service," and avoids mentioning the regiment in which he was broke, must have been a familiar type in the old planting days. Mr. Louch, of the firm of Cumming, Jones & Co., Tea Agents, and inventor of the Big Tea Amalgamation Scheme, is probably still remembered in Calcutta. Even at this geographical distance some of the details of his career seem familiar, though we do not suppose that, before bolting from Calcutta (or Jutepore), he ever sold his famous carriage and pair ten times over, or that he ever actually bought Durand's tea estate for a lakh of rupees worth of forged shares, and then branded Durand as the forger. For the plot of the story our readers must go to the "Tea Planters' Romance" itself, and see there how "The Dead Man's Gift" put Lieutenant Marling's twenty-acre estate in the middle of that Golgotha of stone and desolation, the Landslip, into Durand's hands, and how mysteriously Durand was directed to the discovery in the Landslip of some odd hundred-weights of rough, but enormous, sapphires. These wonderful stones set everything right. It is a real pleasure to congratulate Mr. Compton on a book that, coming from any recognized English novelist at home, would have won success as a remarkable effort of imagination. As Mr. Compton knows what he writes about, he must, we suppose, be content to think that he has told his own experiences in his own way and an admirable way it is. If his tea is only half as good as his book, Mr. Compton should, however, have no reason to grumble. He was boycotted at Mincing Lane, if we remember rightly, for selling his teas in an original way. His old enemies will find it difficult to boycott his book. It is a right good "chop."—*Times of India.*

FIBROUS PLANTS AND THEIR TREATMENT.

A factory has been established in High Street, Lambeth, under the supervision of Mr. Taylor Burrows, late of Lisle, for the treatment of various fibrous plants. Samples of these plants of every species can now be submitted for carefully-supervised trial, and if the present machines or processes prove unsuitable in some little detail or other, the defect will be discovered and remedied. In like manner advice will be given as to the best machines and methods of treating fibrous plants, and the opportunity will be afforded of studying the various processes of production, and of acquiring a knowledge of the most scientific methods of preparing fibres. In fact the present enterprise promises to develop into an important public technical school, for it is proposed to establish branches in textile manufacturing and cognate centres. From a still wider point of view the fibre factory may he regarded as an exhibition and a permanent institution for perfecting machinery and processes relating to the treatment of fibre-bearing plants of every description. The various processes to be carried at the model fibre factory comprise the rapid retting and ungumming of fibrous plants; automatic breaking, scutching, combing, and hackling; spinning into simple or mixed yarns; cottonising and woollenising fibres to imitate fine cotton or wool, suitable for the manufacture of various mixed and cheap fabrics as well as for fine and costly goods; bleaching and dyeing the same, and the rapid drying of fibres by means of cold air. The factory consists of a spacious warehouse and store room for machines and samples, with offices annexed; and a large machinery and operating room, with a laboratory and an engine and boiler house. The chief feature in the operating room is a new machine for dealing more particularly with leaf plants, such as phormium tenax, aloes, agavas, palms, and the like. We saw, says a writer in *The Times*, who describes the factory, some phormium tenax put through this machine with great success, and with rapidity and simplicity. Another machine is a scutcher for hemp, flax, rheea, and, in fact, all stem fibres. In this we saw some rheea stems from France easily decorticated without previous soaking or steaming. The wood was well taken out and the fibre left ready for ungumming and subsequent treatment. In the plants thus treated the fibre is got out mechanically, and is then treated according to requirement, by ungumming, bleaching, and preparing for spinning. There is also a spinning machine in order to test the various fibres in this respect, and to see how they are likely to meet the requirements of a commercial article. Another important improvement is also being introduced at this factory, and that is the rapid retting of flax. The usual method of retting is to soak the flax in water for about three weeks. By the new process this will be effected in about a couple of hours. This quick action is brought about by submitting the flax to the intermittent influence of heat and moisture, which is stated to be very effective, and in no way to act prejudicially upon the fibre.—*H. and C. Mail.*

THE BLACKMAN TEA WITHERING SYSTEM.

Data, based upon actual working experience in India, more than endorse the good opinion we formed of the Blackman system of tea withering when we commented upon it in 1885. The fact of its being a *truly natural process*, or more exactly speaking, a reduction of the *natural process* to complete control, in the simplest manner possible, at once invited sympathetic attention to it, in that all attempts to "wither" artificially as distinguished from "natural withor" had so far proved failures. It was recognised that the extreme simplicity of the Blackman system, by requiring no manipulation of the leaf, no boxing in of space, no trollies, and in fact nothing but the simple fans erected judiciously to suit existing tea houses, left it unapproached for efficiency, simplicity, and economy. That this estimate was justified has since been amply demonstrated by the unanimous testimony of those who have tried it according to the plans provided by the Blackman Ventilating Company's experts. As we have said before, the fan is only the tool employed, and though its record of success is without rival, this success in a large measure depends upon the amount of skill shown in erecting the tool to suit local conditions and requirements. From time to time reports have come home from India which have been most encouraging, but it was not till last cold weather that planters seem to have been irresistibly tempted by the results they witnessed on those gardens supplied with the system. Orders then came in freely from those districts where the success of installations erected upon the plans sent out from home had carried conviction to the sceptical. Some of the reports received by the managers of tea companies, from the garden managers, upon the working of the Blackman system this season, speak for themselves. The manager of Teekulpar (Cachar), writing to the manager of the Land Mortgage Bank, Limited, under date June 27th, 1890, says: "The highly favourable characters the brokers give our latest teas, are due to something more than the natural improvement of the leaf, and I think this may fairly be attributed to the excellent work the Blackman propellers do. . . . Experience shows that the temperature is not very high. . . . The morning's leaf is weighed into the tea-house about midday, and the rolling commences some time that afternoon; the evening's leaf is either rolled the same night or very early the following morning. One very great advantage of this plan is the excellent colour we are able to get in the course of fermentation. . . . The fans have been put to a very special test during the past fortnight, the rain, day and night, having been almost incessant, so much so, indeed, that some of our neighbours (without fans) have had to stop plucking as they cannot wither their leaf, but our manufacturing of tea has gone on as usual, and the quality of the tea is as good as if the weather were fine. . . . I am happy to be able to report that the use of the Blackman air propellers in our tea-house has been a very decided success, and that the general adoption of these useful machines should work a revolution in the system of manufacturing tea." The same manager, in a subsequent letter dated July 10th last, confirms his first report as follows:—"The propellers are doing our work admirably, and we are having no difficulty in withering the whole of our leaf with them, and this during a succession of weeks of the worst weather one could imagine for manufacturing."

The manager of Lattakoojan Tea Estate (Assam), writing to the manager of the Land Mortgage Bank, Limited, under date June 13th last, says:—"The time occupied in withering, of course, depends in a great measure on the number of dryers in full operation on the ground floor, but in *no case* as yet has it exceeded five hours, the least time being only three hours. *It matters not whether the leaf comes in dry or wet* if there is sufficient heat on the ground floor a *perfect* 'wither,' *as good as any natural 'wither,'* will be obtained in the time specified. . . . As the new withering loft can accommodate 90 maunds of leaf at a time and wither it at the latest in five hours, I need hardly say that we are *now quite independent of all the old withering houses.*

"Then, the manager of Boro Jalingah Tea Estate (Silchar) writing to the manager of Land Mortgage Bank, reports that 'It has been working since April 27th and runs smoothly and well, withering leaf brought in at 12 o'clock in the forenoon, the same leaf being ready for rolling by 4-30 p.m. This I should not consider much of a test of the machine, as the chamber was only completed *in part.*'"

These extracts show that experience is bearing out most satisfactorily the forecast we ventured upon in 1885. It is necessary to reiterate the desirability of the system being erected upon plans sent out from home, based upon the experience already there col-

lected, and with due regard for the expert opinion which the Blackman Ventilating Company possess, to a unique extent, upon all that relates to the laws governing the movement of large volumes of air in motion, and the vagaries to be provided against.—*H. and C. Mail.*

BONES.

The Government of India last October invited the attention of Local Governments to the increasing exportation of bones from India, and asked the Department of Land Records and Agriculture in Bengal to embody remarks on the use of, and trade in bones, in its annual reports. From information gathered on the subject in Bengal it appears that within the last few years the collection of bones from village wastes for export to Calcutta has become the regular profession of a low caste of Hindus—Chamars—and is gradually extending to the outer parts of Bengal, in proportion to the increasing demand of the Calcutta mills, and the extension of railway communication. Heaps of raw bones collected for transport to Calcutta may now be seen along the railway and principal river routes of Bengal. Bones are also collected by the indigo planters of Behar for use on their indigo land. Many of them have erected mills for grinding them to dust. The bones brought into Calcutta are bought up for manufacture into bone-meal. With the exception of a comparatively small quantity of bone-meal sent out to tea-gardens, the report says the whole of the output of the bone-grinding mills in Calcutta is destined for export. The price of bone-meal is said to range from R2 to R2-8 per maund, according to the degree of its fineness and purity.

Numerous experiments to test the efficiency of bone-meal as a manure for paddy have been made in Burdwan and Hooghly. It could not, however, be ascertained how much of the increased yield on any plot manured with bone meal was due to this manure alone, for in most of the experiments bone-meal was mixed with saltpetre, hide-salt, etc., and the experiments made by the ryots were deviod of precision. The best guide to the value of this manure would seem to be the evidence of the ryots who have tried it. The testimony of the ryots and farmers was nearly uniform to the effect that bone-meal is quite as good a manure as oilcake for paddy, potatoes, and sugarcane, but that its effect does not last for more than a year, and that better results were obtained in sandy than in clayey soils. Although bone-meal is acknowleged to be a good manure, oilcake is believed to be superior to it in many respects. It is also much cheaper than bone meal, and is open to no objection on the ground of caste feeling. Until, therefore, bone-meal can be offered at cheaper rates than oilcake, there seems to be no hope of its general adoption in native agriculture.—*Madras Times*, Aug. 19th.

FALSIFICATION OF TEA IN CHINA.

A French chemical journal just to hand gives the analyses of some teas recently seized at Dunkirk and Paris, where they had been sent from China. M. Riche found in his examination of several samples, that they did not differ decidedly from genuine tea in their ash and in the proportion of tannin. But in searching for the alkaloid, the samples were found to give no crystalline theine at all, but in its stead a greenish, viscid substance. It is remarked that the highest percentage of tannin found in the investigation was 16·80. A paper by M. Collin follows, treating the subject from a morphological point of view. The author gives cuts showing the structural peculiarities of true and spurious tea, both as seen with the naked eye and the microscope. He remarks, that this fraud is more readily detected by means of the lens than by chemical analysis. Every true leaf, of whatever variety, has serrated edges. Mr. Hooper, the Government quinologist, who, has analysed a large number of teas, informs us that the adulteration is, no doubt, due to an admixture of leaves from a tree belonging to the same or an allied natural order of the genuine tea bush. The *Gordonia obtusa* belonging to the tea-order, for instance, has leaves with the same aroma and containing tannin and ash in very similar proportions, but the amount of alkaloid forms a very small percentage of the leaf. The Gordonia is a tree very plentifully distributed in the Nilgiris, but the leaves are different to those of tea, both in their margins and apex. A few years ago, Indian planters were looking upon their Chinese brethren with dreaded rivalry, and this was increased when the medical faculty at home were recommending the finely flavoured leaf of the celestials in preference to the so-called harsher tea of India. But we need not fear competition much longer, for when adulteration and falsification are resorted to by men of business, the trade somewhere is radically bad, and China will have to look elsewhere for a market for this time honoured commodity.—*South of India Observer*.

COCONUT BUTTER.

Mr. B. C Basu of the Agricultural Department of Bengal, writes to the Agri-Horticultural Society, Calcutta:—

"I took four nuts of average size, neither very big nor very small, and had the kernel reduced to a coarse pulp with a native instrument called *karni*. The nuts were not fully ripe; the kernel was fully formed, but was yet a little soft. After the kernel had been made into pulp, the latter was squeezed in a thick piece of cloth to express the 'milk.' A little water had to be added to the pulp to make the milk run out freely. The whole of the milk could not, however, be expressed, as I had no proper appliance to do the work. The 'milk' was measured and found to be 3 *paos* or roughly 24 oz., of which quantity 1 *pao* may be taken as water added to the pulp in the act of expressing the milk.

"Immediately after the milk had been expressed it was churned in a soda-water bottle. I intended to use the English churn which I have recently procured from England, but the quantity of milk was too small to be put into a churn. I should mention here, that in the experiment with coconut milk which I made in the last cold weather, I had no need to add any ice or cold water, but in the present experiment, which was made sometime about the end of last April, the weather was hot, the consequence being that the butter refused to 'come'. I then added a little iced water to the milk in the soda-water bottle, and the butter grains immediately appeared. The whole operation did not take more than 15 minutes and could be finished in half the time if cold water was added in the beginning. All that I had now to do was to wash the butter in cold water and gather it into a lump. The butter weighed just a little over 1½ chittacks or 3 oz., that is, 12½ per cent. on the milk. This I considered encouraging; but my surprise and disappointment were great when on opening the vessel in which I had put in the butter, I found that it had all melted and was floating on the top of the water. In the cold weather the butter kept pretty firm day and night; but in the hot weather it would be impossible to keep it solid, unless it was put in iced water. Under the circumstances, I believe it is useless trying

to make coconut butter in a hot climate like ours."

In a subsequent letter Mr. Basu conjectured that the butter fats of the coconut might be of two or more kinds, with different melting points, and in that case those that melt at a low temperature might be removed and the balance would remain solid.

In connection with the subject, the following from the journal of the Society of Chemical Industry is of interest:—

The following is an extract from the last report of the United States Consul at Mannheim on the subject of the manufacture of coconot butter in Germany:—

"German chemists discovered in the coconut a fatty substitute for butter.* This discovery was made by a Dr. Schlunk, practical chemist at Ludwigshafen-on-the-Rhine. Shortly after the discovery was made a firm was established in this city under the name 'P. Muller and Shone,' which sunk a large amount of capital in an enterprise, having for its object the production of the new article, to which they gave the name of coconut Butter. The results achieved have more than justified their expectations. The firm is not able to meet the constant demands made upon it. Although in existence only one year, it employs 25 workmen, who get from 25 to 75 cents a day, has a 40-horse-power engine, and produces daily 3,000 kilos of butter, which retails at from 55 to 65 pfenings, or from 13 to 15½ cents per pound, or 25 to 30 cents per killogramme.

"The nuts are obtained from almost all lands lying in the tropics especially from the South Sea and Coral Islands, Arabia, the Coast countries of Africa, and South America. Natives in countries where the nuts grow have for a long time used the milk of these nuts instead of food oils. It contains 60 to 70 per cent of fat, and 23 to 25 per cent of organic substances of which 9 to 10 per cent is of albumen. Liebig and Fresnius had already discovered the value of the coconut oil, or fat, but did not succeed in its production as a substitute for butter, The new butter is of a clear, whitish colour, melts at from 26 degrees to 28 degrees C., and contains 0·0008 per cent water, 0·066 per cent mineral stuffs, and 99·9932 per cent fat.

"It hardens at 190 C. It is better adapted, however, for the kitchen than for the dining-room, that is for cooking purposes than for the uses to which butter is put on our tables. It is neither disagreeable to the taste nor smell. In a country where real butter runs all the way from 25 to 35 cents. per lb., and coconut butter costs but 15 cents, a great future must open up before the latter. At present it is chiefly used in hospitals and other State institutions, but is also rapidly finding its way into houses or homes where people are too poor to buy butter. The working classes are rapidly taking to it instead of the oleomargines, against which so much had been said in the papers during the last two or three years.

"The new butter is said to be singularly free from acids and other disturbing elements so often found in butter, especially that made from milk taken from cows diseased with tuberculosis. Here it is estimated that fully 10 per cent of the milk-giving cows are so troubled. This absence of acids and other matter renders its digestion much easier, hence the preference already shown for the new article by hospitals and such institutions. There are those who do not hesitate to declare this new substitute as healthier and infinitely preferable to the too often bad butter brought on the market, and not to be named in the same breath with oleomargarines made too often from the diseased fat of horse and sheep flesh.

"When it is remembered that Germany has already some 50 factories making olemargarines and other artifical butters, and that some 180,000 *centners* are procured annually, it will be readily seen that regular butter will have hard work to hold its own in a hundred uses against its new rivals, and especially so since the oleomargarines and artifical butters of all kinds are placed under severe, careful, and watchful state inspectors."—*Indian Agriculturist.*

* The young kernels scraped to the consistency of cream give special zest to Sinhalese curries.—Ed. *T. A.*

Bananas and Melons in Assyria.—In the July number of the *Babylonian and Assyrian Record*, Dr. Bonavia attempts to show that the Assyrians partook of Bananas and Melons at their dessert. So far as the Melons are concerned, this doesnot seem at all unlikely; but as to the Banana, the case seems rather more doubtful. It may have been so, but the illustrations given from Botta's *Monuments de Ninive*, seem as much like bundles of Asparagus as Bananas. Surely the Assyrians did not make use of a Covent Garden bundling machine?—*Gardeners' Chronicle.*

The International Congress of Agriculture and Forestry, at which Great Britain, among other States, is represented, was opened at Vienna on Sept. 2nd under the presidency of the Marshal of the Province. The members of the Congress number nearly 909, delegates being present from Great Britain, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Roumania, Russia, Servia, Sweden, Switzerland, South Australia, India, Brazil, and Japan. The representative of England is Mr. Ernest larke, the secretary of the Royal Agricultural Society of England. Upon the president of the committee, Baron Hohenbruck, Councillor of the Ministry of Agriculture, and the secretary, Chevalier Max von Proskowetz, F. R. G. S., a gentleman well known in England by his, exploration in Central Asia and Eastern Russia has fallen the brunt of the labour of organising the congress.—*O. Mail*, Sept. 5th.

MINOR AILMENTS AND THEIR CURES. II.

Baldness, or Loss of Hair.—This generally results from worry and overwork, or impairment of the general health. Many preparations of cantharides are recommended, but many of these undoubtedly prove beneficial. At the same time, it must be remembered that it is not purely a local complaint, and much may be done by improving the gensral condition of the health. A bland, unirritating application for the scalp is Lanoline, which is readily absorbed by the skin. Lanoline contains cholesterine (a fatty substance), and it is this which maintains the hair lustrous and soft without greasiness. Lanoline, in the form of Lanoline Pomade, shuld be rubbed in freely night and morning, preferably in front of a fire. Hazeline applied freely by means of a piece of Lawton's Absorbent Cotton will speedily relieve any inflammation or irritation of the scalp.

Asthma.—Asthma is a paroxysmal ailment to which many persons are subject. The attacks usually come on suddenly, vary greatly in intensity, and may last from ten minutes to three or four hours. It is sometimes no easy matter to cut short an attack, but benefit will often be experienced from the use of Nitre Papers, Stramonium Cigarsttes, and the use of the Chlroide of Ammonium Inhaler (Vereker's). In the intervals, the administration of ten drops of Pure Terebene every three hours, with its occasional inhalation, has been found beneficial. Pinol has also been used for this purpose, and is now largsly employed. It is very important that the bowels should be carefully regulated, and for this purpose, Laxative Tabloids may be used, one or more being taken every morning according to the requirements of the patient.

Black Eye.—One of the best applications for a black eye, resulting from a blow or contusion, is Hazeline, applied freely on lint or absorbent cotton. Very hot water, applied frequently, is one of the best remedies. As a rule the condition runs its course, and it is difficult for the sufferer to prevent an unsightly appearance for some days.—"*Health,*" London.

SOME OBSERVATIONS ON TEA DRYING MACHINERY.

(BY C. B.)

* * *

In deciding upon the best class of machine, the first question to be considered is *power*; if the factory is supplied with unlimited water power the decision should at once be made in favour of one of the *fan* machines, because the fuel consumed by such is about 10 per cent. less for weight of tea dried than by machines which do not require power. If there is abundance of steam power available the same consideration holds good, but to a limited extent, because the extra fuel used in the boiler will nearly balance the difference of fuel used in the drying machines, and the fact is to be taken into account that the engine will have to be kept going for hours after the rolling work is finished. When power in the factory is limited, it is obvious that the decision should be in favour of such machines as the *Up*-draft Sirocco, because it is independent of the engine, and can be placed in any part of the factory, irrespective of the position of the other machinery.

Several machines to do the required work are better than one only of large capacity, because any little accident deranging the latter would bring the whole of the drying to a standstill, whereas in the former case a difficulty with one machine could be overcome by extra pressure upon the others; and, besides, if the extra heat from drying is utilized for withering floors overhead, it is evidently better to have such heat-producing apparatus distributed than to have it concentrated on one spot, unless indeed withering fans are employed to distribute the heat. Another consideration is that it does not pay to work a large machine for drying a small quantity of tea in the slack season, for it stands to reason that an immense body of iron, and perhaps brick, as well as *floor*, takes a great deal of fuel to bring it up to a temperature of 240 deg.; and this is an expenditure which is greater even for a short day's work than for a long one, because there is a longer interval of cooling down between working hours. Besides all this it is well to have one or two machines doing the finishing off only, as no machine yet invented will, under ordinary circumstances, dry the tea *pucca* at one go. Viewed from every point, therefore, it is better to have, say, not less than four machines for a moderate sized factory than to have one large machine capable of drying the whole.

In choosing a type of machine it is well to look to *substantiality*; of course it goes without saying that a machine which will unfailingly produce tea of even ½d. per lb. better than others is to be got at all cost; but no such superiority has yet been established for any one, and the fact remains that the most substantial will prove the best in the long run; provided always that the price is not *very* serious (though they are all more expensive than they should be), since it is quite possible that during the next five years some genius may place in the market an article which will meet most of the requirements still left untouched.

A machine with an excessively powerful fan is to be avoided by all, for many reasons. Such a machine is useless for final firing, because it will blow away the finest of the tea; it dries rapidly by passing through the tea a much larger quantity of air than in the more moderate processes, and the fierce strong blast must destroy a great deal of the aroma of delicately flavoured teas; the *power* required to work such a fan is enormously more than people are apt to think when they twirl the thing round by one hand when the bolt is off; and the consequent consumption of fuel in the boiler and the wear and tear of connecting machinery are no small items: the heat in the air after passing through such a machine will be found to be out of all proportion to the amount of moisture carried away, and is therefore a direct waste and in many cases must be a positive nuisance. It is a mistake to think that such heat can be utilized for withering because drying is supposed to be going on when the withering is finished, or nearly so.

It is an undoubted fact that machinery is a saving of labour, and some of the drying machines save a great deal in that way; in most cases this saving is to be reckoned at much more than the actual wages, because it sets free the labour for other work in the most busy season, when increased cultivation may be of vast importance to quality as well as quantity of tea.—*Indian Planters' Gazette*, Aug. 26th.

THE RAMIE FIBRE.

PROGRESS OF ITS MANUFACTURE IN THIS COUNTRY.

Editor, "Manufacturers' Record."

Now that fabrics made of ramie fibre, and of American manufacture, are on sale and can be had regularly of the trade, one more staple hitherto unknown to the American agriculturist may be established on a scale that will produce an annual revenue to the farmers aggregating an immense sum. All experiments in the cultivation of the ramie plant in this country have been on a small scale, not even sufficient in their proportions to demonstrate an efficient and practical method of decorticating the stems.

A serious obstacle to the progress of ramie cultivation in this country has been the element of doubt regarding the demand for the fibre. Enthusiastic writers upon the subject of ramie culture have greatly exaggerated the demand for China grass (ramie) said to exist in Europe. In recent years the price of China grass has been so high, compared with other fibres, as to prohibit its use in Europe except in moderate quantities. Large sums of money have been expended in Europe experimenting in the fabrication of what is universally acknowledged to be the finest and most valuable vegetable fibre known to the commercial world. Costly experiments were conducted to properly ungum the fibre of imported China grass. Generally these experiments have been unsatisfactory, while the appearance of the resulting fibre seemed perfect, being fine, glossy and white. Yet when spun and put into cloth the fabric would crack, and many other difficulties were met with in this fabrication which were known only to the art.

Moreover, the fibre obtained was always costly, which made it necessary to introduce it only into high-priced goods. This involved another class of experiments, such as machinery for spinning and to complete the fabrication of a kind of goods that would command a sufficient price to make the enterprise remunerative. Some of the European experimenters seem to have been partially successful, but they have not created a large demand for the fibre.

From an American standpoint, there is not a large establishment in Europe running on ramie. It has remained for Mr. Charles Toppan to thoroughly and perfectly ungum the fibre, so that it can be spun and carded by ordinary cotton and woollen machinery, giving a result that permits the fibre to be used in the manufacture of cheap fabrics. This has not been accomplished in any other country, and its value can hardly be overestimated, for inasmuch as the fibre is produced cheap enough to be used in low grade goods, now the demand for the raw material will be large. The evidence of this is in the fact that the first six months of 1890 will show a consumption of China grass in the United States greater than was consumed in all Europe in the year of 1889.

The manufacture of goods from ramie is now established, and the fibre will soon find its way into the highest grade of fabrics. Men's suitings and fine underwear are already being made here from it.

A commercial journal, recently commenting on the varieties of ramie, states that there is an annual variety valuable only for cordage. This is probably an error as to its being a variety of ramie. China and Japan produce the well-known commodity we know as China grass or ramie, and while there are several varieties, the plant is a perennial. The annual referred to is probably in no way allied to the China

grass of commerce, but it may be a fibre used to adulterate. The adulteration of China grass for shipment is not new, and has frequently attracted the attention of shippers.

The mechanical decortication of ramie in the field has not made such progress as has been made in the degumming of the ribbons. The reasons are plain. In solving the degumming problem, many tons of China grass were at once imported and the product turned out, not by the pound, but by the ton. Yarn is now being made by the ton, and the products are being sold by the bolt. Machines that effectually and rapidly produce the ribbons from the green stems in the field will put the United States in the lead as a ramie producing and manufacturing country. But the ramie must be grown to be decorticated. The ribbons must be produced by the ton and continued until many tons are produced before results are obtained. Possibly the recent offer of the use of a machine free to those who will grow 25 acres of ramie within the next two years will stimulate its cultivation.

T. ALBEE SMITH.

JAMAICA AND ITS FORTHCOMING EXHIBITION,

BY C. WASHINGTON EVES, C.M.G.

PLANTING PROGRESS IN JAMAICA.

Jamaica is singularly varied in its climate and natural features. Its general botanical resources are of a wonderful extent and richness; its useful or economic plants have been thoroughly investigated, although as yet a small number have entered largely into commerce. These latter have, however, received much attention from Mr. D. Morris, the present Assistant Director of the Royal Gardens at Kew, when he was in charge of the public gardens and plantations of the island, and one of the important features of the exhibition will be the proof of the value in arts, manufactures, and food, of the economic plants of Jamaica. The island is 144 miles long, its greatest width is 49 miles, and its least width—going straight across from Kingston to Annotto Bay—is 21½ miles. It contains 4,193 square miles. It is diversified by mountains and their attendant streams, and the climate ranges from 75° to 80° on the coast and flat lands adjoining, to 60° and 65° on the high mountains, such as the Blue mountain range. The dryness of the atmosphere upon elevated portions, such as the Santa Cruz mountains, has attracted much attention for its health-giving qualities, and its influence upon consumption and bronchial affections generally.

This deversified elevation is naturally conducive to variety of cultivation. Sugar is grown (though to a much less extent than formerly) in those parts of the island specially adapted to its cultivation, whilst the, Blue Mountain coffee is the finest in the world. Fruit especially the banana, is grown extensively. Cinchona bark does not, at present, appear to be increasing as an article of export, chiefly owing to the low prices at present ruling. If a febrifuge could be produced on the spot cheaper than quinine, there would be a better prospect of success for this industry. In the cultivation of tea the labour difficulty may possibly be felt. The director of public gardens, Mr. Fawcett, reports:—"From the Blue Mountain ridge down almost to the sea coast on the north side the conditions are favourable for the growth of tea. The plant has become naturalised, springing spontaneously from self-sown seed;" and the manufactured leaf, when shown at exhibitions, has been much approved. Jamaica oranges, says Mr. Fawcett, "ought to be able to hold their own anywhere against those from Florida; they are finer fruit, and produced at much less expense. Land in Jamaica is abundant and cheap, and the soil is fertile." A great drawback is that the fruit is either shipped in an improper condition, or is not packed with care. An object lesson in packing oranges will be one of the most useful features of the Exhibition. While upon this point, I might refer to some remarks made by Mr. D. Morris. in the paper read by him before the Royal Colonial Institute in February, 1887. Fruit equal to a value of £8.000,000 sterling is yearly imported into the United Kingdom. The import into the United States must also be very large, nearly the whole of the fruit grown in Jamaica going to that country. Mr. Morris says, and I quite agree with him, that "when fruit is produced in large quantities, and it possesses a distinct value in foreign markets, it is a matter which concerns the Government, no less than the people generally, to take every step that is practicable and suitable to place that fruit in such a market in the best possible condition. Great care is taken generally in the preparation of crops of sugar, coffee, cacao, pimento. tobacco. ginger, and other produce; but the careful and scientific treatment of fruit, although capable of yielding returns proportionately quite as large as any of these, is practically overlooked, and consequently the loss entailed upon both growers and shippers is enormous." We may hope that the Exhibition will produce such examples as will remove this reproach so justly made by Mr. Morris. Indeed, his remarks have had already considerable effect.

A select committee of the Jamaica Legislative Council recently reported as follows upon this question:—"Your Committee believe that one chief danger to the fruit trade lies in the fact that the parties engaged in packing fruit are ignorant of the best methods in force in countries where the trade has reached far larger dimensions than is likely to result in Jamaica, at least for some years to come; and they are of opinion that great benefit would accrue if experienced fruit packers could be introduced from the Mediterranean, or the Western or Canary Islands. If the trade accepts this suggestion, and should ask the Government to assist in introducing this class of skilled labour, your Committee recommend that the Government should render all the aid it can in its introduction."

It cannot be too plainly stated that the future of the fruit trade of this island depends mainly on the proper selection and packing of all kinds of fruit exported; and the trade will not only be injured directly but the island must also suffer, if those who are engaged in the business do not combine to do all that can be done to prevent the shipment of fruit of poor quality, or defectively put up.

The total acreage in Jamaica under cultivation and care, in 1879 and 1888, was as follows:—

	1879.		1888.
	Acres.		Acres.
Canes	44,948	...	33,616
Coffee	22,853	...	20,075
Ginger	130	...	218
Arrowroot	33	...	10
Corn	649	...	822
Tobacco	341	...	167
Cacao	37	...	935
Vegetables	44	...	51
Ground provisions	58,444	...	79,382
Guinea grass	122,369	...	122,197
Common pasture	272.431	...	313,137
Common pasture and pimento	42,010	...	44,539
Pimento	1,155	...	1,455
Total number of acres under cultivation and care ...	565,448	...	616,594

Note.—Fruits are not included in the above statement, as they grow indifferently among other products.

It cannot be held that the above figures show any sensible advance in ten years. The most satisfactory items are the ground provisions. grown by the peasantry occupying small holdings; and the cacao cultivation There are a number of small settlers in Jamaica, growing patches of cane, and possessing sugar mills made of the hard woods of the country. The appliances are no doubt very crude, but if they could be improved, and the extraction made more economically, such as industry might increase.

Of the actual resources of the island available for export, the Table of Exports for the years 1888 and

1889 respectively may be taken:—

1888.

		Value £	s.	d.
Annatto ...	524.429 lb ...	3,583	11	9
Arrowroot ...	27 cwts. 2 qrs. 21 lb	38	3	6
Beeswax ...	1,033 cwts. 1 qr. 21 lb	4,822	15	0
Cattle, neat ...	79 ...	790	0	0
Cocoa ...	4,750 cwts. 0 qr. 6 lb	10,640	2	5
Coconuts ...	5,909,301 (number)	20,682	10	10
Coffee ...	98,965 cwts. 2 qrs. 8 lb	321,440	2	3
Cinchona bark ...	4,015 (number)	151	7	0
Fruit, bananas...	3,093,393 bunches	270,671	17	9
„ limes ...	634 barrels	317	0	0
„ mangoes .	299,584 (number)	258	9	0
„ oranges...	47,910,177 (number)	64,678	14	8
„ pineapples	9,812 dozens	1,471	16	0
„ shaddocks	10 barrels	5	0	0
Ginger	10,222 cwts. 0 qr. 13 lb	19,462	18	2
Hides	277,828 lb	5,788	2	6
Honey	1,680 cwts. 1 qr.	1,344	4	0
Horses and Mule	100 (number)	2,377	0	0
Lancewood spars	7,921 (number)	2,383	15	6
Limejuice	85,963 gallons	2,865	8	8
Pimento	66,559 cwts 2 qrs. 2 lb	44,727	19	9
Rum	1,868,490 gallons	202,419	15	0
Sheep's wool	19,448 lb	323	12	8
Sticks (walking)	16,842 loose, 628 bundles	434	12	0
Succades	73 cwts. 0 qrs. 22 lb	469	14	0
Sugar	490,480 cwts. 0 qr. 25lb	288,402	7	9
Tamarinds	4,939 lb	90	9	0
Tobacco, cigars.	7,008 lb	3,504	0	0
„ (unmanufactured) ...	... ...	...		
Tortoise shell ...	2,008 lb	578	11	0
Turtle ...	2,688 (number)	4,244	10	0
„ (prepared and dried) ...	8,587 lb	1,132	6	10
Wood, bitter ...	218 tons 10 cwts	437	0	0
„ ebony ...	57 tons 5 cwts.	143	2	6
„ fustic ...	2,463 tons 8 cwts.	7,390	4	0
„ lignum vitæ	20 tons 13 cwts.	61	19	0
„ logwood ...	100,901 tons 6 cwts.	353,154	11	0
Yams ...	28,194 cwts. 1 qr.	11,277	14	0

1889.

		£	s.	d.
Annatto ...	455,874 lb	3,798	19	0
Arrowroot ...	7 cwts. 1 qr. 14 lb	11	6	8
Beeswax ...	1,018cwts. 0 qr. 22 lb	4,571	11	8
Cattle, neat ...	26	260	0	0
Cocoa ...	5,248 cwts. 3 qrs. 19 lb	10,581	16	5
Coconuts ...	4,831,615	15,219	11	9
Coffee ...	84,606 cwts. 0 qr. 8 lb	291,383	6	2
Cinchona bark ...	3,321 (number)	66	0	0
Fruit, bananas...	2,881,313 bunches	252,114	17	9
„ limes ...	701 barrels	350	10	0
„ mangoes .	170,988 (number)	100	19	6
„ oranges ...	35,394,271 (number)	51,321	13	10
„ pineapples	8,292 6-12 dozens	1,036	11	3
„ shaddocks	33 barrels	16	10	0
Ginger ...	8,952 cwts 1 qr. 1 lb	18,615	8	9
Hides ...	260,641 lb	6,516	0	6
Honey ...	1,248 cwts 1 qr. 2 lb	1,248	8	9
Horses and Mule	67 (number)	3,426	0	0
Lancewood spars	8,062 (number)	2,821	14	0
Limejuice ...	77,745 gallons	3,239	7	6
Pimento ...	46,179 cwts 3 qrs. 21 lb	47,842	8	4
Rum ...	1,374,931 gallons	137,493	2	0
Sheep's wool ...	23,081 lb	384	13	8
Sticks (walking)	171,144 loose, 1,303bundles	2,576	11	1
Succades ...	48 cwt. 3 qrs. 13 lb	197	3	2
Sugar ...	323,238 cwts. 1 qr. 1 lb	244,368	2	5
Tamarinds ...	1,775 lb 32 kegs	45	15	0
Tobacco, cigars	4,479½ lb	2,799	13	9
„ (unmanufactured) ...	1,593 lb	79	13	0
Tortoise shell ...	3,673 lb	1,469	4	0
Turtle ...	2,742 lb	5,007	14	0
„ (prepared and dried) ...	12,069 lb	1,529	17	0
Wood, bitter ...	649 tons, 19 cwts	1,299	18	0
„ ebony ...	383 tons 2 cwts	956	15	0
„ fustic ...	793 tons 8 cwts	2,142	3	7
„ lignumvitæ	446 tons 19 cwts	1,251	9	2
„ logwood...	115,454 tons	375,225	10	0
Yams ...	6,149 cwts 0 qr. 16 lb	3,074	11	6

The new struggling industries in the above list will be noticed. Tobacco makes no way at present. The difference in the export of yams between the two years suggests an unfavourable season for roots and ground provision. Upon the whole, the above table presents a state of things which is certainly capable of great improvement. The valuable and historic industry of sugar, for instance—an expensive product requiring large capital for expenditure, principally in wages enjoyed by the industrial classes—should not be allowed to die out while Englishmen eat every year nearly a million tons of beet root sugar, produced by foreign labour, and aided by foreign State bounties. A careful consideration of the above figures will show that there is much to be done, not only in maintaining existing industries but in planting new ones, a number of which have been suggested, and will be reforred to later on; and it is for the purpose of calling attention to the undeveloped agricultural wealth of the island that an exposition of its capabilities is so much desired.

As the exhibition is primarily a display of Jamaica products, it was opportune on the part of the Governor to issue a "Message to the people," recommending local effort in every part of the island. His Excellency mentions that prizes will be offered for samples of the following, among many other things, grown or made by the people:—Sugar-canes, cacao, kola, bananas, oranges, ground provision, coconut, Sisal hemp, Manilla hemp, tobacco, cigars, cinchona, coffee, peppers, ginger, pimento, rum, logwood, fustic, annatto, castor oil, coconut-oil, cattle and horses, sheep, pigs, poultry, birds, fishes, turtle, bees, carpentey, cabinet-making, basket-work, nets, mats, goldsmiths' and silver work, models of cottage homes, boats, fancy work, &c. Greater researches for minerals are recommended. Gold, silver, and copper have been discovered in the Charing Cross mine, and ten tons of ore have been recently shipped to London. Special arrangements are also suggested for collecting large samples of the various rubber substances to be obtained from a number of trees. From the mineral, vegetable, and animal kingdom, a great variety of raw material could be obtained, some that might locally be manufactured or prepared for consumption, and others useful to the manufacturer abroad. In the different parishes are found limestones, sandstones, flagstones, marbles, road materials, sands, ochres, clays, ornamental and precious stones, gypsum, copper ores, lead, iron, zinc, cobalt, manganese, antimony, gold, and silver. Few countries are better supplied with building-stone, which varies in degree from the finest marbles to coarse but enduring sandstones. Fine marbles of different patterns and colours are found in many parts. There is a great extent of granite rocks.

Jamaica is rich in fibres, and a serious attempt is to be made to utilise them for several purposes. Bamboo and megass (or the sugar-cane after crushing) might become important for paper making. In the even of the Esparto grass failing, as was at one time feared, a substitute becomes very important. I have some excellent specimens of paper stock and writing paper, made some years ago by Mr. Routledge from bamboo and megass. There are many other uses for the fibres found in Jamaica. What is wanted is a good and inexpensive machine for their extraction. The institute of Jamaica has offered a prize of £50 for the best set of machines which may be shown at the Exhibition. I have communicated with the principal English and foreign manufacturers upon the basis of information forwarded by Mr. Morris, of Kew. It might be interesting to quote some extracts:—

"The set of machinery might include a banana machine, as well as others. The banana machine should be portable and simple, adapted for the expression of water from the stem of the banana, to be constructed especially for the use of small plantations, and at a cost so as to be placed within reach of small cultivators.

"The following native and other fibre plants are already found in Jamaica, and machines are desired to clean the leaves or stems of any of them.

I. Aloe Family.—1. American aloe (*Agave americana*). 2. Keratto (*Agave Morrisii*). 3. Sisal hemp or hene

quen (*Agave rigida*). 4. Fœtid aloe or Mauritius hemp (*Furcræa gigantea*). 5. Silk grass (*Furcræa cubensis*). 6. Dagger plant (*Yucca aloifolia*). 7. Bowstring hemp *Sanseviera zeylanica*). 8. Bowstring hemp (*Sanseviera guineensis*).

II. Ananas or Pineapple Family.—1. Pineapple (*Ananassa sativa*). 2. Pinguin (*Bromelia pinguin*). 3. Silk grass (*Karatas Plumieri*).

III. Banana and Plantain Family.—1. Banana (*Musa sapientum*). 2. Plantain (*Musa sapientum*). 3. Manila plantain (*Musa textilis*). 4. Abyssinian plantain (*Musa ensete*).

IV. Nettle Family.—Ramie or rhea (*Boehmeria nivea*).

"As regards the fibre of the plantain and banana, it is estimated that about two million stems of these plants, after bearing fruit, are cut down every year in Jamaica. In the absence of a suitable machine to prepare the fibre, these stems are allowed to rot on the ground, or are converted into manure. A full-grown plantain or banana stem weighs about one hundredweight, and contains only about two pounds of fibre. The bulk of the stem is made up of watery juices and soft pulp. A simple and effective machine of the nature of a wringing or mangling machine is required, through which portions of the banana or plantain might be passed to free them from water. The machine must be portable, and the rollers should be made of hard wood. Iron would soon rust, and also be too heavy. When the stems have been passed through the machine, they could then be easily carried to a more elaborated fibre machine, or taken to the nearest stream and washed and beaten.

"It is well known that banana fibre is not of high value, and probably would not be worth more than one penny or penny half-penny per pound. On the other hand, its production, under present circumstances in Jamaica, would entail very little expenditure, and, with a suitable machine, would bring in a considerable revenue to the cultivators. Even at one penny per pound, Jamaica could produce banana fibre worth about £20,000 per annum."

We also want information as to the latest processes of sugar-making—that is the means of extracting the greatest quantity of juice from the cane, and the greatest quantity of sugar of good quality from the juice. We should like to obtain, for instance, a model of a diffusion plant, now so largely used in Europe in the beet factories. It is possible that the fibres of the cane may prevent the rapid and easy slicing by knives, which is found adapted to the beet-root, and that the process may not be found a good substitute for the old-fashioned system I believe that enterprising planters, both in Demerara and St. Lucia, are making practical experiments, and we hope to be able to obtain for the information of sugar makers in Jamaica a model of the apparatus employed. Rum distillation, too, is important for Jamaica. Rum is a natural product of the sugar-cane, and is an article for which Jamaica has long been famous, the flavour and quality depending not so much upon manufacture as upon soil. The Chancellor of the Exchequer recently asked: "Who drinks rum?" It is evident that a considerable quantity is drunk, and some is no doubt employed in the manufacture of European brandies and whiskies. So long as there is a demand for rum, Jamaica is justified in producing it, and no other country has such natural advantage for its production. A knowledge of the latest improvements in distillation might supersede the somewhat crude and rule-of-thumb method too frequently adopted.

It would be also interesting to obtain models or specimens of machines for preparing the coffee berry for consumption, and others showing the different forms into which cocoa and chocolate are made such attractive articles of food. The preparation of turtle for food, castor-oil for medicine, and the different gum and rubber manufactures, would likewise be desirable for the exhibition.

DISCUSSION.

Mr. Morris said Mr. Eves had stated that the cost of producing cinchona was too great for it to be successfully cultivated in Jamaica, but he thought that was not quite the case. After the cultivation had been carried on for some time, the price fell so low that it was really not worth exporting, and no doubt it would be better for the people to keep their trees for the present, and let the bark become more matured, so that when the price rose they would get a better return. The cinchona trees were more healthy in Jamaica than in many parts of the East Indies, so that he had little doubt about the ultimate success of the industry. As to tea, he thought that in face of the enormous shipments from Ceylon and India, that it would not be wise for the people of Jamaica to take up this matter. The fruit industry was one which had grown very considerably within the last fifteen years, for whereas in 1876 the total value of the fruit exported was only about £10,000, it was now between £300,000 and £400,000. That trade had done a great deal of good to the island generally, though there was no doubt better picking and preparation of the fruit would still further increase its value. The oranges grown in the island were very fine. With regard to fibre industries, he had urged the people to take up this branch, and as the price rose 50 per cent. during the last four years, they might have reaped the full value of the increase. However, it was not yet too late to take up the matter. The Jamaica Institute had offered a prize—£50 for a set of machines to produce fibre in different stages, and he had great hopes of such a machine being brought out. They also wanted a machine for preparing Liberian coffee. Latterly the price of this coffee had increased to such an extent, that in Java it fetched a price equal to that of the best estates coffee, and it could be grown upon the old sugar plantations. With regard to the rum industry, attempts were now being made for the first time to carefully examine the yeast, and trace the real cause of the different qualities of rum produced. There were numerous industries in Jamaica which might be taken up, but the people were so comfortable, and so satisfied with their beautiful climate, that it was very difficult to stir them, and get them to take sufficient trouble to develop fully the resources of the country. He had no doubt that the Exhibition would be a very great success, and that it would be a benefit not merely to Jamaica, but to the whole group of our possessions in the West Indies.

Rev. D. J. East, who had resided for thirty years in Jamaica, said:—The great want of the island with regard to minor products had already been dealt with by Mr. Morris. What was wanted was a better class of machinery, both with reference to fruit and fibre. The people needed instruction as to the gathering of the fruit. He had seen oranges pulled from the trees, thrown into carts, and brought into Kingston in a condition which gave very little promise of their realising a return. He had also seen them hand picked and properly packed, first in paper, and then in suitable barrels for their conveyance, and the difference in the result had been perfectly amazing—the one method as contrasted with the other. Another great want in connection with the fruit industry was better roads in order to bring the produce to the wharves for shipment, and he was glad to know that Sir Henry Blake was giving special attention to this subject. He thought Jamaica might supply the world with fibres. Some of the most valuable fibrous roots would grow on land which was hardly suitable for any other production; but the great want with reference to fibre was suitable machinery. They had not yet had a machine of so simple and effective construction as to be of much use, especially to the peasantry of the country.

Mr. H. Stern said:—Reference had been made by Mr. Morris to the advantages which might have been reaped by cultivating fibre plants, but it was no use doing so unless they had a machine to extract the fibres. Some years ago the Government offered a prize of £50 for any machine which would extract the fibre from the Sisal hemp, and a machine was invented by Mr. Kennedy, but it was found that that would not extract the fibre with sufficient economy to make it marketable He was very glad to see that another prize had been

offered, and he hoped that some good would result therefrom.

Mr. Morris remarked that fibre machines had been at work for eleven years in Yucatan and six years in Mauritius. There was no great difficulty about cleaning Sisal hemp, or the pineapple family; the great difficulty had been with regard to the banana and ramie. He had examined some machines at Paris for dealing with china grass, and it was hoped that M. Favier would send one of his machines to the Exhibition. These machines would prepare one ton per day of the ribbons. The cost of such machines was about £80, while the machines in use at Mauritius cost £25. Full particulars of these machines are given in the *Kew Bulletin* for November, 1889, and May of this year.

Mr. O'Halloran asked what success had attended the efforts of Mr. Morris to cultivate Manilla hemp, which was always marketable, and in very great demand.

Mr. Morris said the Manilla hemp, which was yielded by a kind of banana, was introduced into Ceylon and Jamaica a good many years ago, but unfortunately, they had not been able to get it to flourish; in fact, they had the utmost difficulty even in keeping the plants alive at Kew. He did not believe that the Manilla hemp could be a success in the West Indies. It had been under cultivation in Trinidad, Demerara, Dominica, and at St. Vincent, but they had found that at no spot outside the Philippine Islands would the plant flourish. It would be possible to send the Manilla hemp to any part of the West India Islands, where the conditions were likely to be favourable, but up to the present the results had been most disappointing.

Mr. Scott regretted that more attention had not been devoted in the discussion to the sugar and cocoa industries. He thought, also, great advantages might be derived from the Exhibition in connection with the United States and Canada.

Mr. Morris replied that the cultivation of cocoa in Jamaica was well understood, as was also the preparation of the bean. It was understood they had really been talking that evening of industries which had hitherto lacked success on account of the absence of machinery, or from want of special knowledge. They could not expect to cover the whole of the ground at that meeting, though he was very glad that Mr. Scott had mentioned the subject. They were now dealing with the special difficulties which had hitherto arisen in Jamaica. He believed as land was opened up, and the facilities for transport improved, the cultivation of various industries, both new and old, would be undertaken in the West Indies.

The Chairman said:—I do not know how it may be now, but 50 years ago there were great differences between the coast aspect of Jamaica, and of San Domingo and Cuba. These larger islands are equally beautiful in scenery, but in those days Jamaica alone seemed well cultivated, and to show along the coast line the residence of a population in favourable conditions of life.—*Journal of the Society of Arts*.

EXPERIMENTS WITH MANA-GRASS —ECONOMIC PRODUCTS FOR THE ZAMBESI.

A long letter obligingly written me yesterday by Mr. Ibotson is not very encouraging as to anticipation for success with the present set of experiments for testing the suitability of mana-grass as a board-making material. When my last notes on this topic were written you, my letter stated that it was intended to try the effect of subjecting the boiled grass to the action of edge-runners in the pug mill before passing it into the pulping troughs. It will be as well to give you Mr. Ibotson's own words on this subject, though even his trained opinion must not be accepted as conclusively proving that mana-grass cannot be utilized for the purpose desired, because so much might follow as the result of chemical admixture during the boiling process which is antecedent to those undertaken at the Poyle Mills. Opportunity has not yet occurred for me to learn what the chemical experts may think on this special point, and speculation by myself as to possible remedial treatment had better therefore be omitted, though I can see no insuperable obstacle to its success in anything that Mr. Ibotson has written me. The following are the terms of that gentleman's letter to me:—"Poyle Mills, Colnbrook, Bucks, September 2nd, 1890.—My dear sir,—The treatment of the mana-grass with edge runners certainly improved it a great deal; for whereas we could not at the first trial without edge runners get the stuff to mix with the water at all, on our subsequent trial after being put through the edge runners the fibres mixed with the pulp and worked very well on the cylinder.

"But there was no alteration in the making of the board on the winding cylinder. The fibres or stalks appear to be too hard, and will not felt together into a board. We made two long trials on two separate days—one was of the grass alone, and the other of the grass with boiled starch added, but in neither form could we get a single board that would hang together so as to be taken off the roll. We obtained a few pieces, but that was all; there was no consistency in it to make the board hang together.

"Mr. Stanley and Dr. Evans came down and saw the stuff on the machine. We shall send up to the Syndicate the boards—such as they are—with all pieces that seem likely to throw any light on the subject. But our own opinion is that the grass is a very troublesome material to treat, and that any process that would render it suitable for making into boards would be found a very expensive one to work.—Yours very truly, (Signed) H. P. Ibotson."

Mr. Thomas Christy, F. L. S., who has on so many occasions obliged me with his valuable opinion as to the nature and properties of Ceylon products, has just shipped this week from the London Docks to a Portuguese trading colony on the Zambesi the largest consignment of economic plants which has even left this country to a single order. The plants shipped included coffees, teas, cocoas, peppers, and vanilla, all plants in fact which have formed leading products among yourselves. Mr. Christy selected and packed all the specimens, and he views it as a singular fact that the Portuguese should be compelled to turn thus to the English to assist them in developing the resources of their African territories. What a change this is significant of that has arisen since the Portuguese were the chief colonizing power of the world!—*London Cor.*

LAWES' CHEMICAL MANURE.

The ordinary meeting of this company was held this afternoon at the New Corn Exchange Hotel, Mark-lane.—Mr. W. Colchester, who presided, moved the adoption of the report stating that the net profit for the past year amounted to £25,877, added to which was the balance brought forward, making a total of £33,692 available for distribution. Out of this sum the directors recommended dividends of 7 per cent. on the preference, and of 10s per share on the ordinary shares, carrying £2,500 to the reserve, and writing £5,000 off the land, plant, and goodwill account, leaving £7,739 to be carried forward. During the past year six of the company's acid chambers at Barking had been renewed, and a proportion of the cost charged to revenue. The remainder, amounting to £3,755, the board proposed to write off in equal amounts during the next two

years. The directors had commenced to erect some additional sheds at the works to enable them to store the raw materials required in the manufacture of manure in such a manner as would prevent the necessity of their removal after once being discharged. By this and other means the board hoped to reduce the increase in cost of production caused by the higher wages conceded to their workmen during the past year.—The report was unanimously adopted.—*Globe*, Aug. 29th.

NATIVE PERUVIAN COTTON.

The United States Consular Agent at Payta says that, after five years of drought, the province and State of Payta are naturally depressed in the way of commerce and all kinds of industry. The valley of Chira forms a favourable exception. The production of the valley consists principally of native Peruvian cotton (*Gossypium herbaceum peruvianum*,) an article used very extensively in Europe for the manufacture of woollen goods with which it mixes readily, on account of its rough, strong, and long fibre, is produced abundantly throughout the State after the rainy seasons, which are periodical, and occur generally every seven years, and is cultivated always along the banks of rivers, on lowlands irrigated by the overflow of streams. The plant is arborescent and perennial, and after fully developing continues producing cotton for five or six years in succession, provided there be some moisture in the ground, needing, however, very little of it on account of its deep rooting, thus reaching moisture at great depths. The system of cultivation of this plant is quite primitive, the seeds being planted by making holes in the ground with spades, without tilling or manuring the soil. The plant becomes developed and begins to bear cotton in dry and sandy soil about six months after planting, and about nine months in rich and wet land, continuing to yield at short intervals for five or six more years in succession. The plant may be observed in blossom, with pods, buds, and cotton all at the same time, and giving a continual yield for the time above stated. In certain seasons of the year, about every seven years, the rains are incessant for about two months, both in the interior and on the coast, and water descends in such abundance as almost to inundate the country. Large torrents stream down the mountain side, the valley of the Chira is deluged, flat lands within it are turned into morasses, and morasses into lakes; in fact, the lowland becomes submerged, and the accumulated mass of waters rush with great force down the central valley which forms their only outlet. The valley, however is wide, and the descent very gradual. The extent of the valley through which the water flows is from three to four miles wide, and although it is nearly 200 miles in extent, the valley for the whole distance is almost level. The rains generally cease in March, but it requires from thirty-five to fifty days for the water to disappear and leave the land dry. As soon is that is effected there springs up, from the whole surface of the ground which has been thus submerged most luxurious vegetation. The soil is wonderfully rich, and has been under cultivation by the aborigines from time immemorial, and its fertility is kept up unimpared by the slime which is abundantly deposited during inundation. The cotton is collected, when the pods open, by women and children, who are paid in proportion to the quantity collected, the prevailing rates being about 1s 8d for every 100 pounds. It is taken from the field to the ginning house, where it is cleaned and made up into bales of about 175 pounds each. There are five of such establishments in the province of Payta, one in Querecotillo, on the east side of the river, owned by an Englishman; two in Sullana, a city of about 4,000 inhabitants, on the west side of the river, owned by natives; two at La Huaca, owned by an Englishman and an Italian. A considerable quantity of cotton is annually exported, and seeds are now also exported for oil-making, Europe is the market for both products.—*Manufacturer and Inventor*, Aug. 20th.

RUBBER COLLECTING IN THE AMAZON VALLEY.

A correspondent, signing himself M. C. M., writes to the *Daily News* as follows:—

May I be allowed to speak a word of warning through your columns, to any young men who might be induced by the offer of a high salary to go out to the interior of South America? Last autumn four young men were induced by a wealthy Spaniard, who was visiting Liverpool and Manchester, to go out with him to his estate on one of the tributaries of the Amazon. They found when they arrived there that it was a rubber plantation worked by slave labour, and that two of them were expected to act as overseers. It is not, indeed, slavery in name, for payment is given in the form of a nickel token, with which the labourer buys his rations; but it is compulsory labour, extending to mere infants, and enforced by the cruelties of the lash, and sometimes of the rifle bullet. The English nature of these young men revolted against such a system and they resolved to escape on the first opportunity. Two of them succeeded in doing so, and are now in England, eager to tell their story to save others from being similarly deluded, and if possible to stir up an agitation which may lead to the deliverance of the poor oppressed natives. The third (a near relative of my informant) was drowned by the upsetting of a canoe on his way down the River Madeira. The fourth was unable to accompany his comrades, being ill of fever when they left. I write this in the hope that their fate my deter others from venturing into an unknown region among strangers, unless after searching inquiry they can obtain satisfactory assurance as to the kind of work required, and the character of those who engage them.—*India Rubber Journal.*

SOUTH AFRICAN EXPANSION.

About a month ago Mr. Stanley when referring in laudatory terms to the Anglo-German agreement used these words :—" You have a glorious tableland, and you are in the heart of Africa. So I see now prospects by which British people could breathe in the heart of Africa, whereas before I was very doubtful whether colonists could live there and multiply there as they have multiplied in America; but I see now a possibility, because you will have the whole slopes of Kenia, that magnificent tableland rising to 7,000, 8,000, or 9,000 ft. You have also Mfumbiro, the Mountains of the Moon, and that great escarpment of marl stretching right up to the neighbourhood of the fortress station of Baker. All that territory is fit for colonisation—900 miles in length and 700 miles in breadth." Yet this territory is traversed by the equator. We thus have the great explorer's testimony to the fact that British settlers can be expected to live and multiply under the vertical sun of the line, provided that the country they occupy is at such an altitude above the sea level that the effects of equatorial heat are qualified and neutralised. Heat in a rarefied atmosphere is not only bearable but is compatible with salubrity of climate and vigour of life. This view is corroborated by observation in other equtorial regions—in Peru, in Ceylon, and in the Eastern Archipelago.—*Natal Mercury*, July 30th.

EXPERIMENTS which have lately been made in the Madras Presidency in the treatment of rinderpest with solid cinchona febrifuge, have been encouraging. Out of twenty-two cattle experimented on, fifteen recovered, one was relieved, and only six died. The inspector of cattle diseases says that the drug reduces the temperature very considerably in the first stages, but that in an advanced stage it is of little or no use.—*Indiar Agriculturist.*

THE STEEL ROPE MOTOR: A NEW DEPARTURE.

We call special attention to the following account of the completion and success of the first steel rope motor or conductor of power, utilized in Ceylon. Mr. N. M. Adam, who has seen the Roseneath machinery at work, expressed the opinion to us that the principle is capable of being applied for steel ropes travelling very much longer distances than in this case. There is no reason indeed why steel ropes from a huge turbine, or series of turbines, below St. Clair, Devon or other falls should not be carried to Factories in half-a-dozen directions, for distances up to a mile or so?—We heartily re-echo the regret felt that the respected designer—that able and good man, Mr. John Walker, did not live to see the successful issue of his Roseneath proposal.

(*Communicated.*)

Ceylon is not generally behind other tea-growing countries; but it has been so in the matter of conveying power from a distance by means of a wire rope, and utilizing it for driving purposes. We have had wire shoots and tramways, which have done excellent service; but for this higher work, although much has been written and talked about it, the planters somehow have fought shy and been chary of introducing it. At Darjeeling, as well as at home and elsewhere, it is not uncommon to see the steel rope carrying power from a distant point, and this too in a highly successful way. Here however, a good deal of money will rather be expended in excavating a bad site for a factory so as to bring *it* to the power, than the other way of bringing the power to the factory; and if this can't be done, well an engine is gone in for, which needs constant feeding, and the cheap water motor is sighed over and neglected.

The first introduction to Ceylon of a wire rope arrangement has been made at Roseneath estate, Kandy, and has turned out a complete success. It was during the last visit of the late Mr. John Walker, founder of Messrs. John Walker & Co., that the matter was talked over and arranged for; the details and plans being in the hands of Mr. John Grieve of Messrs. Walker & Grieg. Those who know Mr. John Walker, and have seen how this his last work in Ceylon is as eminently successful as aught else he set his mind to, have considerable regrets that he is not alive today. He would certainly have been satisfied.

Roseneath has no firewood and but a small water supply, so to make the most of what water there is was a necessity. The factory is built on a suitable site at the top of a fall of 70 ft.—the ground, which is very rocky, sloping gradually away from the factory. To utilize this fall the turbine had to be placed a considerable distance from the factory. The turbine is supplied with water from a dam and is regulated at the roller. So that the whole arrangement is well under command and no water need be wasted. The wire rope which transmits the power from the turbine is nearly 400 ft. long, and is carried over a cart road. There was a fear that this might be an objection, as the noise might frighten horses; but so silently does the rope slide along that it can scarcely be heard.

The difficulty of adjusting the rope to suit the change of temperature, and the wear, is got over by means of a very ingenious, efficient, and *automatic* arrangement. Had this been known to the railway engineers at the time they were struggling with the wire shoot at the Blackwater slip, most of their difficulties would have disappeared.

There was one point which caused some fear and trembling. That was the possibility that the rope itself would absorb much of the power. This however has turned out only nominal: so easily is the rope driven that four times more power can be taken out of the water than was formerly developed by a water-wheel. Messrs. Walker & Greig have the credit of erecting the first steel-rope motor in Ceylon; and, as has already been said, they have done this most successfully. Mr. John Grieve, who has seen to the erecting, and generally supervised the work, is fairly justified in feeling not a little proud of it.

TROUT FROM NUWARA ELIYA.

Mr. Le Mesurier's experiment in trout breeding is producing good results when he is able to give out lively good-sized trout to stock other streams. Last week, Mr. Nock of Hakgala got no less than 32 of such trout to carry down and place in the "Sita Ella"—the romantic as well as beautiful stream (a big "burn" in Highland terms) which derives its name from the traditions which fill the neighbourhood with the names of Rama, Ravana and the Queen Sita. Mr. Nock most carefully discharged his duty and was rewarded by seeing all the trout swim away as lively as possible, in the sheltered pool into which he placed them. Anyone who has travelled down the road to Hakgala may have observed that the Sita Ella is, in many respects, the *beau idéal* of a trout stream with its clear pure water, numerous level reaches as well as tumbling cascades. We trust there will be no interference by natives, (there was a rumour of a Sinhalese with dynamite being heard of interfering with streams towards Horton's Plains: should he be caught, severe punishment ought to be awarded); and as the Sita Ella runs along so public a road, travellers should be a check on would-be depredators. We would fain hope that a full measure of success may attend the trout experiment here as well as in all our higher streams. Already trout of several lb. each are spoken of as having been seen in connection with some of the earlier experiments, and a Straits visitor—an eager angler—wrote to us the other day from Singapore that he was never more tempted than by a fine trout he saw in the Nuwara Eliya stream.

COTTON GROWING IN CEYLON.

In answer to Mr. James Robertson's enquiry, the Hon. W. W. Mitchell is good enough to give the following information:—

Mr. Robertson sent us sample pods about a month ago and I reported on them to him. It is just the *kidney* cotton, that so much has been written about, and I really cannot say more than Mr. Robertson says, that "it is the proper kind for Ceylon." I don't think that seed need be imported, for there are trees in many parts of the country, but they are scattered and no quantity can be got anywhere.

I have been supplying Egyptian and New Orleans kinds free to Government and we have plenty of such, but to their requests for kidney kind I have had to say: "Collect it in the villages through headmen—for I have none."

To that part of Mr. Robertson's letter about oil from seed I cannot reply. It could not compete in Europe and would only do for India.

The S. & W. Co. are selling lots of seed of the other kinds at R2 per cwt. and it seems as if the production of it would all be taken off for cattle feeding.

MR. SCOTT BLACKLAW ON BRAZIL.*

PLANTING AND RAILWAYS—MINERAL WATER SPRINGS AT POSSOS DE CALDAS—THE ARGENTINE REVOLUTION.

We cannot leave Campinas without recording that it was here amongst the wealthy coffee planters that the great agitation for railway extension was commenced, and continued. British engineers, working with British capital, showed how railways could be made and managed. The São Paulo Railway was opened in 1862 to São Paulo, and a few years later to Jundiahy, where they stopped. The wealthy coffee estate proprietors saw the advantage of cheap and expeditious transport for their produce to the seaport, and did not flinch from risking their own spare capital. The Paulista Railway Company was formed, and no guarantee of interest was asked for. The object of this local Company was to continue the line westward on the same gauge. Starting where the British Company left off at Jundiahy, they had their first section opened to Campinas at the beginning of 1873 (28 miles) and to Rio Claro in 1876—56 miles further. They made a branch towards the north from Cordeiros, a station south of Rio to Claro, and this they extended until they have now 150 miles opened.

To give traffic for their line they removed several obstructions on the Rio Magyquassú—a river at the terminus of the branch—and put on it steamers of small draught to tow barges which ply for some 100 miles towards the west. The Company has paid an average of 9s.

Campinas continued to be the centre of railway agitation, and it was here that the great Company Moggana was floated and a metre gauge adopted. The first section of forty miles on this narrow gauge—the first which was tried here—was opened in 1875. The writer of these notes was present on that occasion. It was considered so important an undertaking that the Emperor and Empress came from Rio to *do* the opening.

I well remember how surprised I was to see the small American locomotives and the small saloon carriages, long and projecting over the wheels. Little did any one then think, that in a few years the same Company would carry their line far into the northwest of the Province and into Minas and have by the end of 1888—including branches—a length of 500 miles. The Stuana Railway I have already mentioned, as going in a south-westerly direction from Jundiahy. It was commenced and continued about the same time as the Moggana, on a metre gauge, and as already noted has with its branches a length of over 100 miles: the actual length is 113 miles—but it has not paid so well. The districts through which it passes are not so suitable for coffee, but cane and cotton grow well. Both cotton and sugar have fallen considerably in price, and were it not that there is a local demand for the fibre, to supply three or four local cotton factories, the cultivation of cotton would be entirely abandoned. Cane—whose juice is oftener turned into rum than into sugar, pays the cultivator fairly well, but depends for its success on the local demand for inferior sugar, and rum. A great deal of Mascava sugar and molasses rum from the northern ports are imported into Santos for consumption in the Province of São Paulo. There are three large central sugar factories which although worked at a loss first few years are now paying fairly well.

The Sorocabana Railway branches off from the town of São Paulo, goes south-west, through cane and cotton districts, and in the meantime stops at Botucatu, a rising coffee district. It has already opened 233 miles, and is extending some 150 miles southwards towards the river Paranapanema, where in anticipation large blocks of land have been bought up. The river Paranapanema is the division between the province of São Paulo and that of Parana. The country on the sides of this river has not been explored, and consequently there are a good many Indians who may give trouble to first settlers. Notwithstanding this, land-seekers are looking towards it, and Land Company schemes are being organized to buy land from the Government. This soil is said to be good on the high lands for coffee cultivation and there are millions of acres in the plains suitable for pasture. I cannot say that the Sorocabana railway has paid well, there is a sort of mystification between original shares, preference shares, 1st debenture stock, 2nd debenture stock &c., &c., but they always always keep on extending, and with the opening up of the "Wild West" of São Paulo and Parana. I feel certain the shareholders and debentureholders will have a secure investment. I have already mentioned the Braganea Railway striking northward from the São Paulo Railway 30 miles from São Paulo. It goes northwards to coffee districts and measures about 33 miles.

The Paulista Company, which I have already mentioned, had extended to Rio Claro directly west and to the River Magyquassú to the North of Rio Claro, and although they had the preference to extend west preferred to from the latter place. They give their attention more to the opening of the river navigation I have mentioned than to extending the railway beyond Rio Claro westward. The cry of the planters had to be listened to, and the Rio Claro Railway Company was formed to carry a meter gauge line from Rio Claro westward, and with branches this Company now have a length of 165 miles. The line has paid well, and has only a few months ago (June or July 1889) been bought up by a British Company at a handsome profit to the Brazilian shareholders. This line has a bright future before it, for its zone extends also toward the rich *terra rocha* and pasture plains in the west of São Paulo, and to the Province of Mattagrossa. At present the communication between the last-named province and the Capital of the Empire—or even the Capital of São Paulo—is by *sea via* the River Plate. The lands in Mattagrossa are said to be good for coffee, cane, cotton and tobacco and cereals. In the forests are mate, rubber, copaiba, and cinchona, with a host of other industrial and medicinal products. An excellent quality of wheat can be grown, and the high elevation of the great plateau, extending from the Serra de Mar to the foot of the Andes, has a climate which European people can work in and live in.

The following is a list of the railways which have been made since 1873 when the present writer arrived in this province for the first time. At that time only 120 miles were opened, the São Paulo Railway from Santos to Jundiahy 93 miles, Paulista from Jundiahy to Campinas 27 miles. Now there are Rio de Janeiro and São Paulo Railway from Cachoeira to São Paulo starting from the end of Sao Paulo branch of D. Pedro 20...141 miles

"Sorocabana" from São Paulo passing Soracaba	...233	"
"Bragantina" branching off São Paulo Railway	... 33	"
"Stuana" from Jundiahy passing by Stuana	...113	"
"Paulista" from Jundiahy to Rio Claro and branches	...150	"
"Rio Claro" from Rio Claro to Araraguara and branches ...	...165	"
"Mogyana" from Campinas, passing Mogymerim and branches ...	...500	"

* From notes in September 1889, supplemented in July 1890.

Or in round numbers 1,300 miles of railway since the agitation was begun at Campinas sixteen years ago. We all remember the great rise that, about these times, 1873-5, took place in the price of coffee. The leaf-disease had not taken such hold on coffee trees in Ceylon, there were hopes that a cure might be found, or that it might leave in the same mysterious way that it came. Brazil was then looked on as the great rival of Ceylon. In these times your readers seemed incredulous at the figures I gave in estimating coffee crops to be shipped from Rio and Santos, but we were always at one in calculating the great benefit to this country and to your own of railway extension. And how much have all our estimates and calculations been exceeded as regards Brazil in both of these? But, alas! owing to that leaf-disease calamity, Brazil is no more the rival of Ceylon, and the impetus which railway extension has given to coffee production in São Paulo does not interest you since the cultivation of the valuable bean is not your stand-by any longer. In any case looking at the subject from an economical point of view, the same arguments showing that railway extension is the most important factor for the increase in production, can be applied to any country. Let us look at the figures for São Paulo as applied to coffee alone. At the same time *all* of these railways, which I have given you a list of do not depend for traffic on *coffee alone*. In many cases, in particular districts, where little was expected owing to their being out of the coffee zone, large quantities of other things, such as cotton, cane for central factories, Indian corn, beans farinha, lime timber, stones (flags or slates), and a host of things, that no one formerly thought of being transported, have contributed to make receipts exceed expenditure. The same thing would take place in Ceylon, were your colonial authorities to reverse their stick-in-the-mud policy, and spread a net work of railways over your luxuriant island. Leaving out your mountain zone, there is no reason why railways to Mannar, Jaffna, Trincomalee, Batticaloa, and right through Bintenna, could not be made as cheap as in Brazil—£3,000 per mile. Many things which would contribute to give traffic, we do not dream of at present, both from the interior to the seaports and from the seaports to the interior. Given means of transport, a healthy climate, good soil, an energetic class of men to direct, and there is no end to the resources of a new country; and you have all these factors.

But let us return to São Paulo.

In 1860-61 just before the Santos-São Paulo Railway was opened:—

The export of Coffee from Santos was	82,608 sacks
In 1876-77 just as the first metre lines were being extended ..	628,898 „
In 1888-1889 with the mileage I have given above	2,641,706 „

Each sack holds 60 kilograms of coffee, and 1,790 to a ton.

Let us give all honour to the coffee planters around Campinas for seeing the great advantage the railway system was to bring them, in a cheap and expeditious means of sending their produce to market, and for their courage in risking their spare capital in these metre gauge railways. What though these projects were to open up parts which were almost geographically unknown, huntsmen, wandering pedlars and pack-mule men could tell of large blocks of forest at such an elevation above the surrounding grassy plains as to be entirely free from the visitation of frost; and they with beaming eyes would listen to eloquent descriptions of the enormous size of and produce from some few coffee trees, near some native hut in the interior; and then the *terra rocha* was always richer the farther west one went. Wherever a railway was projected, land seekers would flock, land would be bought, forests felled and burned, coffee planted if not with plants or stumps then with seed, enormous crops of Indian corn would be taken off the land while the coffee plants (put in 12' by 12') would be growing, beans, and rice would be grown largely, houses would be built which would be the nucleus of luxuriant palacettes to be. Villages would spring up, churches, post offices, tax-collector's offices, would follow, and soft, hard and dry goods storemen would flock to the centres and build huts in which to vend their wares. So that what a short time ago was a waste wild as the dark continent would soon be turned into a flourishing country-side, so that by the time the railway would be opened traffic would be ready for it.

But what about the working population for the development of all this? Well, we shall see as we get further on. Meanwhile we are embarked—as they have it here—on the great metre gauge railway at Campinas. This Mogyana railway, which has given 14 per cent from the commencement to the shareholders and every year added a large sum to its reserve fund, which by its results owing to economical construction, and good traffic management has enamoured the people of this country with metre gauge railways.

In Brazil after this great success no other gauge is thought of, and only the first made line, the Dom Pedro 2o, and the São Paulo, with the continuation the Paulista, are on a wide 5' 3'' gauge. The extensions of the great Dom Pedro 2o, are now made on a metre gauge, and at the time the Government took this new departure with its own line, it was only after an agitation by the Club of Engineers of Rio de Janeiro that the authorities were prevented from tearing up about 100 miles of broad, and putting down a narrow, gauge. Although I have all the discussion of the Club in my possession I do not care to revive the subject: how often has a discussion of gauges hampered the promotion and delayed construction of useful railway lines!*

But after this long digression, let us continue our journey along the Mogyana railway. Up to Mogymirim, some 45 miles, there is nothing worthy of note; the country is undulating and owing to this the line is very crooked. The exploring engineers seemed loth to lose the side of a small stream when they found one, and unwilling to lead the trace where deep cuttings and heavy embankments would be necessary. As should be in tropical countries the waterways are ample, open culverts being the rule. Bridges were first made of timber, but are now being replaced by iron. In large bridges, which are very few, preference seems to be given to the American truss system. Now and then a ridge higher than the ordinary level of the surrounding country has to be crossed, and there we see coffee fields. The current crop is nearly all picked, (September 1889) and the trees have suffered very much; in fact old coffee trees are left a mass of dry sticks. The late dry season has contributed greatly to this, but the old hand sees it is the result principally of excessive bearing. The dry weather has not prevented the weeds from growing, and although the majority of estates are pretty clean, many are requiring the mamoty. It is astonishing how soon coffee trees planted in *terra rocha* recover vigour after a few showers:

* Better a line on any gauge than none, but the standard gauge will ultimately supersede all others. As we in Ceylon have now over 200 miles of 5' 6' railway made or under construction, our wisdom is not to break gauge.—ED. *T. A.*

drought or heavy bearing does not permanently affect it. All the same on all these coffee estates between Campinas and Mogymirim I prophesy scarcely any crop at all for season 1890-91, that is coming season. Labour seems plentiful enough. The planters hereabout were the first to avail of European colonists—indeed they were in a manner forced to try something, for the exodus of negroes from the cane plantations in the north, or indeed their introduction from any other province was stopped by putting a tax of £100 on every slave entering the province. This was in 1880. Judging by the number of labouring men's houses one sees on all the estates, and the number of European children one sees playing about them, there does not seem to be a scarcity of labour here.

At Jaguary station, 12 miles from Campinas, a branch line of the Mogyana railway goes to Amparo, north-about 20 miles, (31 ks) on the same gauge, to a rich coffee district, and from Mogymirim another branch goes north by a place called Penha to the boundary of Minas Geraes about 35 miles. I may here mention that from the end of this branch a line is under construction which goes along the other side of the Serra Negra, and continues on the west side of the Serra Montiqueira, coming out at Barra de Pirahy on the D. Pedro 2o Railway. It is thought that this new line has a great future before it. It certainly opens up a large extent of agricultural country and will compete largely with other companies for passenger and goods traffic to Rio de Janeiro, the distance being shortened from here to the lastnamed place, some 50 or 60 miles. It will also pass by Caximbu mineral water establishments, the resort of many invalids, and the water springs of Lambary, a sort of Brazilian Seltzer, which is bottled and sent to the large towns.

Mogymirim is a very pretty, clean-looking country town, of some 4,000 inhabitants, and built on rising ground above the level of the railway line. It gave the name to this railway. In these early days of railway construction the Company were doubtful if they could go beyond this district. They soon, however, opened to Casa Branea, making their line 106 miles long from Campinas. On the extension to Casa Branca (*anglice* white house), at 80 miles from Campinas, is the station of Cascavel (*ang.* rattlesnake); from here goes a branch of the same company to Possos de Caldas (wells of Caldas) some 45 miles (77 ks).

Possos de Caldas has been for many years a resort for invalids suffering from various chronic diseases. Sulphurous waters spring out of the ground at a very high temperature. I have for many years had a wish to visit this wells, and you will remember our late lamented friend G. A. C. was to have accompanied me there in 1875, after our shooting excursion to the west, but at this long time I cannot now recall the reasons why we did not go. From where I lived the journey would have taken on mule back four or five days to go; and as long to come back. Now-a-days we have a railway all the way. In the absence of personal observation of this part, I can only give you second-hand information. *Nossa Senhora da saude das aguas de Caldas* (our lady of the health of the waters of Caldas—such is the literal translation) is the name of the village which has of late years sprung up around these thermal springs. The wells have long been known, but being situated in a wild almost inaccessible district, in the south of the Province of Minas Geraes. Few people visited them before the Mogyana Railway was made. Being some 15 miles outside the Province of S. Paulo, it was not within the zone allotted to the Railway Company. That was not the only reason however which delayed the construction of a branch railway to Possos de Caldas. The country is barren, sandy and rocky, and offers very little prospect of traffic, for goods of any description. The soil is not suitable for coffee, and the pastures are not fit for fattening bullocks. The Company got a guarantee from the Government of 6 per cent per annum. The line has not been open for more than a year, and in that year the receipts were some £2,000 less than the expenditure. The Company were thus justified in being reluctant to make this branch sooner. Here are the figures in Brazilian money. You will see that coffee is nowhere and animals are a small item:—

Passengers	..	..R52,398	$43
Parcels and baggage	..	4,708	520
Animals	..	.. 366	340
Carriages	..	... 3	900
Merchandise	..	.. 41,613	440
Telegraphs	..	.. 1,723	620
Store Rents	..	.. 19	000
Accessories	..	.. 354	710
		R101,181	960
Expenditure	..	.. 120,591	450
Deficit	..	..R19,409	$499

The merchandise mentioned, there would be general goods, to supply the local stores, hotels, vendas, &c.

The Company after they saw the line was not paying commenced to run the train once in two days, but a paternal Government, anxious about the health of its people, ordered daily trains, and as Government guarantee 6 per cent of course they are bound to run them. The attractions of the place in these wild hills, at an elevation of some 4 000 feet (1,200 metres) above sea-level, ought to draw many passengers bent on pleasure only, but the unfortunate thing here is that the hot season which ought to send people to the hills is in this country always the rainy one, and the uncomfortableness of these hilly regions in wet weather is in the inverse ratio of their pleasantness in fine. Still enterprizing hotel-keepers offering comfort and luxuries at a fair price, which is rare here, ought to draw many visitors; and I have no doubt when the usefulness of these sulphur baths is better known, tourists and invalids will come from all parts of Brazil and from other countries to test their efficacy. Their history may be summed up as follows:—Some time during the last century when Brazil was a Portuguese colony and very thinly populated, some huntsmen on their chase after tapir, deer and wild boar were led by the accidents of the chase into a small valley surrounded by high hills. At the sides of this valley they discovered some earthslips, and noticed sulphurous warm water oozing through them. It was afterwards found that these springs were almost similar to those at Caldas in Portugal. This gave the name to a town which sprang up some 15 miles to the east, about 1813, and which is now the city of Caldas, and the county town of a large district. The efficacy of these waters in curing rheumatic disorders was known before the year 1815, for in that year a wealthy planter who had been obliged through sickness to experiment on his person their effects, set about purchasing a square Portuguese league of the land (16 square miles Eng.) with the springs in the centre. The Provincial Government laid claim to the land, but the original deed on which they relied, dated 1795, could not be found, only a copy of it. The proprietor found difficulty in retaining quiet possession. In 1865 the rights of the Provincial authorities were again agitated, and to get rid of the annoyance the owner or occupier gave, by deed of gift, some 250 acres (26½ alqueires) in which was included the land on which were the wells and the village, and to settle the question once for all the Pro,

vincial Assembly in 1870 authorized the President to disappropriate the land, declaring it of public benefit.

In three years the Government spent some £3,000 in trying to make the waters useful to the public, but with very poor results, as the money was spent uselessly. Then it was thought they could be better developed by private enterprize, and a concession was given to Dr. José Caetano dos Santos, and he raised a company in Rio de Janeiro in 1873 under the name of Don Pedro 2o Thermal springs. Unfortunately the Company did not succeed, it is said they did nothing at all and in 1880 Dr. José Caetano dos Santos was notified by the President of the province that his contract was rescinded. After public competition the right to make baths, build hotels &c., was given to some private individuals, who after bartering and selling parts of their rights, and speculating, the proprietors are now reduced to poor persons. It is said that up till now there has been spent by the syndicate from first to last some £40,000.

The syndicate had a good deal to do, for they found the springs in almost their primitive condition, a series of holes full of boulders and mud, as the tapir and wild boar had left them. These animals made the same use of them as your buffalos make of a muddy hole or wet paddy field. The first thing to do was to build cisterns for enclosing the springs. There was little difficulty in doing this, as the pudding-stone rock, through which the water comes, was reached at from 3 to 4 feet from the surface. The names of the first three so enclosed are *Pedro Botilho*, *Chiquinha*, and *Mariquinha*. There was greater difficulty in the canalization, for the water could not be taken far without losing heat on the way to the baths. This was successfully effected: the water of these three springs was united and conducted in pipes to the bathing establishment by gravitation. This was in 1882. The temperature of these three is from 44° to 45° (Centigrade 112° to 113° Fahr): at the springs and baths can be taken at the establishment at 37° Cent. (98° Fahr.), which is blood heat. There is another fountains some 600 metres further away named *Macacos*. The baths from it are taken at 35° Cent. (or 95° Fahr.). At the funt this one has a temperature of 42° Cent. (107° Fahr.) It is of this one that water can be *drunk* if so ordered. The rule seems to be to take a bath at the general baths during the day and in the cool evening take a walk to *Macacos*, to have a drink, the distance from the bath-rooms to Macacos being 600 metres—about a third of a mile; but as I said above the water from Macacos is also canalized and brought to the bathing establishment losing some of its heat on the way. The two cisterns of Macacos water at the bath-house hold 4,500 gallons each.

Residual analysis.

Sulphuric acid	...0·0566
Silica	...0·0200
Carbonic acid	.. 0·2293
Chlorine	...0·0042
Lime	...0·0110
Potash	...0·0165
Soda	...0·2973
Organic matter and stones	...0·0191
Magnesia and iron traces	...
Total	...0·6540

As to gases 10 *cc*, 6 were encountered per litre being the same at all the fonts. (sulph hydric acid) nitrogen and sulphurated hydrogen in equal portions.

Interpretive analysis of 1 kilogramme of water

	Grammes
Sulphate of potash	...0·0305
Sulphate of soda	...0·0756
Chlorurete of soda	...0·0069
Carbonate of lime	...0·0195
Carbonate of soda	..0·4450
Silica	...0·0200
Sulph hydric acid	...0·0027
Nitrogen	...0·0013
Organic mater and stones	...0·0191
Carbonate of magnesia traces	...
Carbonate of iron traces	
Total	...0·6206

The complaints the waters are said to cure, or to assist medical treatment, are scrofula, chronic rheumatism in all its forms, chronic bronchitis, catarrh of the lungs, asthma, diabetes, functional paralysis, female complaints, and effects of mercury in the system.

The visitors to Caldas are not confined to those suffering from the above, but it is beginning to be looked on as a sort of resort for people who feel seedy, and for families going to spend a month or six weeks for a change of air. There are nice views from the tops of the hills which surround the little town, and being 4,000 feet above sea level, the climate in the hottest part of the year (barring the rain) is very agreeable.

Visitors from Rio if they go by rail spend one night in S. Paulo and next afternoon they are at the wells. Return tickets are given which extend for a month, these would not exceed £7 for first class: the hotel and bath charges would be about 12 shillings per day.

I have mentioned that the rock through which these waters come is a conglomerate, or pudding-stone, composed of gravel and stones of various sizes with a binding matter of hydrosilicate of lime. The geological formation is no doubt volcanic.

But let us return to our journey and our old friend coffee whom we seem to have lost sight of. From Moygmirim to Casabranca at which place we arrive after a run of some 27 miles from Cascavel (where the junction of the Caldas branch is); very little coffee is to be seen. The land is what is called campo, undulating, and covered with illuk grass. These campos are burned every year whether it be the owner's wish or not, if he do not set fire to them, some mischievous person does. These fires are dangerous things, for often forest land and dwelling-houses get involved in them, and there is no way of finding out who the fire raiser is. Of course one may expect that this keeps the ground in a dry baked state, and not fit to grow any kind of crop. The young herbage which shoots out from the roots of the burnt grass is very sweet and is greedily eaten by cattle, horses and sheep. I should say that nine-tenths of the land one sees along the line from Mogy to Casabranca is of this class.

At Casabranca commences the new districts for coffee which were begun to be cultivated after the railway agitation mentioned above. The great pioneers here were the family of Prado. Antonio Prado who was for some time Minister of Agriculture and Martinho Prado, junior, who was Provincial Deputy, did so much to encourage immigration of Europeans, and was the means of effectually putting an end to buying and selling slaves, being the agitator for levying a heavy tax on all slaves entering from other provinces. These two and their father Martinho Prado, senr. were amongst the first to give unconditional liberty to their slaves before the emancipation law was passed, and finally they were the foremost advocates for unconditional liberty being given at once to all which I have already noted. But as this letter has run out to a length which may try your patience I must leave what more I have to say for another occasion.

Rio, July 28th, 1980.

P. S.—I intended to have given you some notes on our political situation, but the ' John Elder" has come in, and goes away sooner than I expected. The Republic of Brazil is doing well. I have some notes and translation in pencil on the constitution, which will be revised by the constituent assembly in November next, but I shall write them out for the New Zealand steamer on 31st.

Our Financial Minister, in spite of great opposition from all commercial classes, is adhering to his decree of obliging 20 per cent of import and export duties to be paid in gold at 27d per *milreis*, while paper is valued at 22½d at present. It is calculated that each farthing up or down of exchange counts 1 per cent more or less of duty. This will make up as total tax *ad valorem* on imports of some 50 per cent on most European goods, —unless agricultural machinery, which has to pay 6 per cent emancipation tax.

A fearful revolution has broken out in our neighbouring republic, the Argentine, brought on principally through financial mismanagement and robbery by the governing powers—so says the *Proclamation of the Provisional Government* as the insurgents call themselves. At present the *Telegraph* says they are killing each other in the streets at Buenos Ayres—some 300 having been killed yesterday. At present the fighting is confined to the military, but it is expected the people will take the side of the insurgents, who have some battalions of the army and the part of the navy on their side. The *Proclamation of the provisional Government* accuses the president *de jure* of great irregularities, of robbery, bribery, and interference with the liberty of the subject, and the rights of property. Their paper money is at 310 per cent. That is to say for a 100 gold dols: one must pay 310 in paper, and duties have to be paid half in gold. The late President is blamed for the depreciation of the currency. President Juarez elman entered into office poor, and is now said now to be a millionaire: the same with other members of his Government. The head of the revolution is General Campos, who has already proved himself a brave officer in the wars, but Leonardo Allem is put forward as President, a respectable citizen and honest.

THE CEYLON HANDBOOK AND DIRECTORY FOR 1890-91.

(From the *Aberdeen Free Press*, Aug. 23rd.)

"The Ceylon Handbook and Directory," compiled and edited by Messrs. A. M. & J. Ferguson, editors of the *Ceylon Observer*, has been mentioned in our columns before now. In a supplementary sheet issued with the overland edition of the *Observer* of 28th July, the preface to the edition of the Handbook and Directory for 1890-91 is printed in full. And in it a very hopeful view of the condition and prospects of our leading Crown colony is given. The knowledge and experience gained in collecting information and making all the needed investigations "justifies us," say the editors, "in repeating the expression of the sanguine hope that, during the term of office—1890-5—of Governor Sir Arthur Havelock, Ceylon will have fully regained (through the great tea enterprise) that planting prosperity which was lost through the dire effects of the coffee-leaf fungus in the time of his predecessors; and we further see the promise in our other new industries, together with the continued extension of palm as well as grain cultivation, of a degree of stable comfort and even wealth for the people such as could not be imagined when Ceylon was at the very height of its ancient glory in the days of the great king Parakrama, the creator of 'the Inland Sea.'"

Of the social and intellectual condition of the "Spicy Isle," the editors say:—"We cannot regard with satisfaction the fact that twice as much is annually spent on 'intoxicating drink' in Ceylon as on 'education and the teaching of Christianity'; the proportion being, according to our estimate, between four and five millions of rupees, say £450,000, on the former, and not quite £230,000 on the latter, or less than twopence per head of the population!

"Nevertheless, as compared with India, in public instruction, Ceylon is far in advance, having 1 out of 26 of her population in school, against 1 in every 150 in India; while in England the proportion is now, we suppose, 1 in every 4 or 5. Education is very cheap in Ceylon, and in respect of teaching in the vernaculars especially, a small amount goes a long way; but it is an 'English' education that the natives—both Sinhalese and Tamil—crave after, and it is evident that, *nolens volens*, our educators, whether missionary or Government schoolmasters, cannot help themselves until in a comparatively short time, perhaps before another century dawns, from Dondra Head to Point Pedro, English will practically be found to be the language chiefly used by the people of Ceylon."

THE PROSPERITY OF CEYLON.

Says the London correspondent of the *Glasgow Herald*—a copy of which has been sent to us by a Ceylon colonist:—

One of the most striking economical incidents in recent British colonial history is the prosperity of Ceylon. Fifteen years ago "coffee was king," as the saying ran in that island; Ceylon depended on coffee as absolutely as Guatemala does now; coffee built railways and made roads, paid the taxes and kept up many an establishment at home. Then came the failure, caused largely by the growth of the South American produce and the fall in prices, and for several years Ceylon was on the verge of bankruptcy, and many of the principal planters went down never to rise again. After a short time, tea was tried, with the now well-known result. I have lately seen a return from Ceylon which shows that tea plantations now cover a larger area than those of coffee did in the palmiest days. Tea flourishes where coffee failed. In whole provinces where coffee was tried over and over again with no result, tea plantations now flourish. Tea, again, grows luxuriantly where coffee languished, for it is hardier, and will grow at higher altitudes. "As a general rule, wherever coffee has succeeded best, there also tea has yielded good results. Hence it follows that tea dominates over all the old coffee region, and a vast territory besides where coffee failed." The consequence is that Ceylon has for several years past enjoyed even more than its old abounding prosperity; its revenue shows a good surplus, public works are being steadily continued, and planting is once more profitable. But this time it is under the reign of King Tea.

AN EXCHANGE DIFFICULTY.

To the Editor of the "Pioneer."

Sir,—Now that exchange has taken an upward course which it is likely to maintain, I, in common with others of your readers, am somewhat at a loss to know why it has not already gone higher. For two or three weeks past the American Government have been buying silver at 119½ to 119⅝ cents the ounce, which unless the American dollar has gone down in European exchanges, is within a small fraction of a penny of the rate at which silver sold in the years before 1873, when the bimetallic ratio of the Latin Union was in force and the rupee was at or about two shillings: yet the rupee is at present worth only 1s. 8½d. Can you explain the discrepancy or rather can you explain how the rupee ever came to be worth two shillings? An ounce of fine gold, I understand, exchanges at the English mint for £3 17s. 6d., and that the old bimetallic ratio of 15½ to 1 makes the price of fine silver 60d., which was practically the rate at which that metal sold for many years prior to 1873. Now a rupee weighs 180 grains and contains about 165 grains of fine silver, which at the above price makes its intrinsic value (neglecting alloy) 1s. 8⅝d. How did it ever come to be worth two shillings? TYRO.

[Our correspondent has overlooked certain factors in the value of the rupee. The silver in the coin was never worth two shillings sterling: for its value is enhanced over that of bullion by the seignorage of 2·25 per cent which is charged by the Government of India for coinage. One has to add also the cost of transport to India, freightage and insurance, and the loss of interest on the money while it is passing through the mint, a process which generally occupies about 14 days. These expenses are generally taken to add about 3⅓ per cent to the intrinsic value of the Indian standard coinage. At this rate we get the following table of equivalents, which may be useful to our readers:—

Price of silver per ounce.	*Value of the rupee.*		*Price of silver per ounce*	*Value of the rupee.*	
d.	*s.*	*d.*	*d.*	*s.*	*d.*
45	1	5·27	50½	1	7·40
45½	1	5·47	51	1	7·59
46	1	5·66	51½	1	7·79
46½	1	5·84	52	1	7·98
47	1	6·04	52½	1	8·18
47½	1	6 24	53	1	8·37
48	1	6·43	53½	1	8·56
48½	1	6·62	54	1	8·75
49	1	6·81	4½	1	8 95
49½	1	7·01	50	1	9·14
50	1	7·20	65	1	11·7]

Pioneer, Sept. 10th.

NUTMEGS AND WEATHER.

North of Kandy, Sept. 26th.

Some of the nutmegs we have put out show already a growth which has surprised me, knowing as I do the deliberate nature of the nutmegs' advance. On the whole I was more than satisfied with the clearing.

The weather for tea has of late been of a very rough nature. Cold winds taking the tea bush by the throat and demanding that it should deliver. No good got that way. It has been an abominable bad quarter this, but the weather is now turned genial; so we trust to make up later for the backwardness of the past.

THE MADRAS REPORT ON CINCHONAS.

A copy of Mr. Lawson's report has now reached us from the Madras Government. We have already quoted the report from the *Madras Times*, but we now give Mr. Hooper's analyses of the soils:—

From the Government Quinologist, to the Government Botanist and Director of Government Cinchona Plantations, Nilgiris, dated Ootacamund, 8th April 1890.

I have made an analysis of four samples of sub-soil taken from different parts of the Wynaad and representative of that in which the cinchona plants are grown.

The four samples were labelled, respectively—

1 Pallacoon.	3 Carpencolli.
2 Glenmary.	4 Alexandra.

Separated from the few stones present, powdered and sifted, the samples had the following appearance:—

1 Bright reddish brown.	3 Reddish brown.
2 Dull reddish brown.	4 Brown.

The soils were very similar in mechanical composition. They were ferruginous earths with variable amounts of quartz sand. Nos. 2 and 4 contained micaceous schist. They might be catalogued as light sandy soils, except No. 3, which contained an appreciable quantity of clay, and was, therefore, a sandy loam.

A chemical analysis revealed the presence and amount of the following constituents:—

	1	2	3	4
Moisture	3·64	2 92	2·58	3·24
Organic matter and combined water	11·61	9·24	4·69	6·85
Soluble salts	·11	·13	·10	·02
Alkaline chlorides	·26	·46	·14	·27
Iron oxides and alumina ...	15·77	11·03	7 90	14·11
Lime	·26	·21	·14	·17
Phosphoric acid	·23	·16	·11	·21
Silicates and quartz sand ...	71·53	77·62	85·20	72·87

In comparing these figures with those obtained by the analysis of Nilgiri soils, it is observed that, with regard to the mineral matter, there is a full proportion and there is a fair amount of lime, phosphoric acid and alkalies (potash and soda). The soluble salts are small and they consisted of chlorides and sulphates of the alkalies and alkaline earths. The chief feature in the chemical composition of the soils is the small amount of organic material and the consequently small quantity of nitrogen present. In soils, which I have analysed from the Nilgiris, Gudalur and other places acknowledged to be good for the cultivation of cinchonas, more than double the amount of organic matter and combined water is usually met with. As the greater part of the samples was made up of rocks in a state of incipient decomposition, this will account for the absence of much nitrogenous and carbonaceous substances and the high proportion of silicates and sandy matter.

The results obtained by Mr. Hooper clearly indicate the application of stable manure, or of rotted straw, grass or weeds with some form of ammonia. But at present we fear manuring cinchonas will not pay.

CHIEF INDUSTRIES OF THE MADRAS PRESIDENCY DURING THE YEAR 1889.

[The following summary affords hints of importance as to industries that might be established in Ceylon.—ED. *T. A.*]

Of the important industries carried on in the Madras Presidency during the year 1889, there were six bone-crushing factories, two in the Coimbatore district, one in South Canara, and three in Malabar. Of these four were not worked, viz. Messrs, Pierce, Leslie & Co's in Coimbatore, Messrs Volkart Brothers' and Ouchterlony & Co's at Calicut, and Alston, Low & Co's at Kottayam. Messrs. Stanes & Co's factory in Coimbatore crushed 63 tons of bones valued at R3,162 and the Boloor Works in South Canara, 97 tons valued at R4,075. The Cement Manufactory of Messrs Arbuthnot & Co. at Madras turned out 60,000 cwt of cement, valued at R1,20,000. This factory also makes tiles and carries on the industry of lime-burning. 60,000 tiles, valued at R3,600, were made during the year, and 1,600,000 measures of lime, valued at R11,040. Of Coffee curing works twenty-three are returned viz., two in Coimbatore, five in South Canara, ten in Malabar and six in Madura. The most important is Messrs. Volkart Brothers' Works at Kottayam which turned out 4,724,720 lb. valued at R20,82,294, followed by Messrs. Pierce Leslie & Co.'s works at Calicut, which produced about R12,97,949 and Messrs. Arbuthnot & Co.'s Plantation House Works showing an out-turn of R9,00,000 for Coffee and R1,07,711 for Cinchona. The three works in Coimbatore—Messrs. Stanes & Co's, Messrs. Pierce, Leslie & Co.'s and the Jeppu Coffee Works—are worked by steam power. The works of Hinde & Co. and Pierce, Leslie & Co. at Kottayam show a falling off in the out-turn as compared with last year owing to the fact that coffee-producing districts (Coorg) on which Tellicherry mainly depends for its supply of coffee suffered much from the leaf-disease, which seriously affected the produce. Of cotton presses and cotton weaving establishments other than mills there were forty-three viz. three in the Kistna District, two in Cuddapah, three in Anantapur, seven in Bellary, one in Trichinopoly, ten in Tinnevelly, eight in Coimbatore, four in Malabar, and five in South Canara. The most important works were those of Milligan & Co. in Tinnevelly, with an outturn of 1029,7,000 lb. of Cotton, valued at R27,60,190, besides 329,700 lb. of cinchona, valued at R61,819. and 151,400 lb. of senna, valued at R7,550; the Fort Press, Tuticorin, with an out-turn of 7,874,000 lb. of cotton valued at R21,57,476, besides 546, 800 lb. of senna valued at R43,744; the Tuticorin Cotton Press Company, Limited, out-turn 5,929,500 lb. valued at R15 17,952; Dymes & Co.'s. Press at Adoni, out-turn 6,008,606 lb. valued at R13,96,532; and the New Berar Company (Limited) in Tinnevelly, out-turn

4,760,000 lb. valued at R13,18,400. Messrs. Groves & Co. had a flour mill and bakery on the Nilgiris, the annual out-turn of which was R15,000. There were only two Ice Factories, those in operation in the Presidency town. The Madras Ice Manufacturing Company turned out 606 tons valued at R33,855 and the South Indian Ice Company, 268 tons valued at R12,504. As regards the manufacture of Indigo there were 44 factories in Salem and six in Ganjam. Forty-nine vats in Vizagapatam, 40 in Godavari, 1,408 in Kistna, 1,465 in Nellore, 1,021 in Cuddapah, 203 in Anautapur, 23 in Bellary, 794 in Kurnool, 272 in Chinglepnt, 569 in North Arcot, 465 in South Arcot and 40 in Trichinopoly. There were six iron and brass foundries, viz. one on the Nilgiris, two in Madras, one in South Canara, one in Trichinopoly and one in Godavari. The number of mineral and Aerated Water Manufactories are returned at 32. One Indian Condiment factory alone is returned for Madras, that of Messrs. P. Vencatachellum & Co. Messrs. Stanes & Co., have an Oil-cake press at Coimbatore and Messrs. Alston & Co., in Malabar. There are sixteen lamp-oil manufactories in the Godavari district with an aggregate out-turn of 9,903,037lb. valued at R10,06,398. Only one Rice-Mill is returned, belonging to the Coringa Rice Mill Company (Limited). There were 5 Coir Works, four in Malabar and one in South Canara. The Mylitta Silk Mills Company (Limited) carries on work in Madras and Coimbatore; the out-turn was 1,920lb. of tassar silk thread, valued at R21,120. Five Sugar Factories are returned, one at Aska and four in South Arcot. The Aska Factory turned out 26,896 cwt. of sugar, valued at R3,58,620. Of tanneries conducted on the European system thirty were at work, viz., three in Madras, one in Bellary, 14 in Madura, three in Coimbatore and two in Trichinopoly. There were 11 Tile Manufactories in South Canara, two in Malabar and one in Madras. Messrs. Groves & Co., possess timber mills on the Nilgiris, and the Basel Mission has carpentering works in Malabar. Thirty-two Cigar Manufactories are returned, viz., 18 in Trichinopoly, four in Madura, nine in Godavari and one in Malabar. Of these the most important are John Heimpel's Cigar Factory, Dindigul, with an out-turn of 5,000,000 valued at R75,000 Spencer & Co's., T. B. Arumuga Mudaliar's and Ibrahim Khan's of Trichinopoly, the out-turn of each firm being returned at R75,000.—*Madras Times.*

BOOK NOTICES.

GEMS AND PRECIOUS STONES OF NORTH AMERICA. By Geo. F. Kunz; illustrated, 336 pages, size $7\frac{1}{2} \times 11$ inches. Ornamental cloth cover. The Scientific Publishing Co. Price, $10.

Two years ago popular interest was awakened in the subject of the precious stones of this country by an illustrated article in *Harper's Magazine*, by Geo. F. Kunz, gem expert, with Tiffany & Co. Last year Mr. Kunz was in charge of the exhibit of precious and semi-precious stones sent by Tiffany & Co. to the Paris Exposition, part of which is now in the Museum of Natural History in this city. The exhibition attracted world-wide attention and won for Mr. Kunz a gold medal and high honors. An indefatigable student, he stands foremost in his line; Special Agent of the United States Geological Survey, member of the Mineralogical Society of Great Britain and Ireland, the Imperial Mineralogical Society of St. Petersburg, the Societie Francaise de Mineralogie and other scientific bodies.

The Harper article and the exhibit paved the way for the appearance of a sumptuous volume, an *edition de luxe*, illustrated with eight colored plates, each one of them a revelation of the wonderful skill of the drinters in color, and attesting the great advance made in that art since the days when the country went wild over the now much despised chromo. The work is a popular description of the gems and precious stones of North America, of their occurrence, value, history and archæology. It also contains a history of the collections in which they exist, a chapter on pearls and remarkable foreign gems owned in the United States. We recall no work in which the subject of precious stones, mineralogy and archæology have been so closely associated.

Thus far, scarching for gems has not figured, in American industrics, save in two States—Maine and North Carolina; and yet, Mr. Kunz tells us, nearly all the known varieties of precious stones are found in the United States. The eight plates in colour furnish fac-similies of many of the gems found in this country. One lingers in admiration over the illustrations which have a depth and brilliancy and fidelity to the originals that is remarkable. Plate 7 is a reproduction of drawings—A., Rutile in quartz cut heart shape (Venus hair stone, Fleche d'Amour, Sagenite) found in Alexander County, North Carolina. B. Smoky quartz, from the same locality. C. Rutile in quartz, West Hartford, Conn. This latter is a superb bit of work, the smoky, almost clove-brown color being closely copied, while the crystals of varying size, from the fineness of a hair up to one-quarter inch in diameter, and which cross and intersect each other in all directions, and of a reddish brown lustrous color, are reproduced with surprising fidelity.

Plate 6 is a study in color that will charm the most critical. It represents a cut amethyst from Maine and a group of amethyst crystals from Pennsylvania. The gradations of color in this plate, and the prismatic effects and the play of light on the cut gems give them an approach to the brilliancy of the stones themselves, which is a revelation of the printer's skill.

Plate 5: This is a double-page illustration showing five gems. A large crystal of emerald found in North Carolina; an Amazon stone (Microline) from Colorado; a cut Aquamarine from Maine; Azurite and Malachite in concentric bands from Arizona, all evidence of rare skill and fidelity in color illustration.

In plate 4 attention will be arrested by illustrations showing different varieties of tourmaline and a section of a crystal of tourmaline from Maine, showing dark blue and pink centre with white exterior. A close approach to the original is found on plate 3 in a representation of chlorastrolite from Lake Superior and an almandite garnet crystal from Alaska.

Plate 2 shows the holy toad of the Zuni Indians, a clam shell incrusted with turquoise and shell. Also a specimen of cyanite from North Carolina and a bit of turquoise in rock from new Mexico, all three rare bits of coloring.

While the volume is artistically of great value its practical worth is immeasurable. The identification of specimens can readily be made from the plates, thus giving the miner and prospector the advantages that hitherto have been enjoyed by the expert, collector, mineralogist and geologist. It is a guide for the dealer and the jeweller. The volume should find its way into every school library, for here we have the history of gems and precious stones. The chapter on pearls is of intense interest. The most important pearl fishery on the American coast is that of lower California where the true pearl oysters are found. This and other fisheries on the west coast extending for 3,500 miles have been confirmed to the Pearl Shell Co., of San Francisco, by special franchise from the Mexican Government.

In 1857 a pearl of fine lustre, weighing 93 grains, was found at Notch Brook, near Peterson, N. J. It became known as the "Queen Pearl," and was sold by Tiffany & Co. to the empress Eugenie, of France, for 62,500; it is to-day worth four times that amount. In the same locality was found a large round pearl weighing 400 grains, which would doubtless have been the finest pearl of modern times if it had not been ruined by boiling open the shell. Within one year pearls were sent to the New York market from nearly every State. Kentucky, Tennessee and Texas are the principal pearl-producing States.

We have in this work an account of seventy-four different collections of precious stones, including those of the United States National Museum, New York State Museum, Metropolitan Museum of Art, those in different colleges and in the hands of private

collectors. The finest known collection of precious stones, and the finest collection of those found in the United States, is the one presented by Mr. J. Pierpont Morgan to the American Museum or Natural History, Central Park, New York. It contains over 1,000 specimens.

We recommend this magnificent volume to all our readers, particularly those who reside in New Mexico, Arizona, California, Oregon, Washington and the Southern States. Each important gem is described and a series of analyses given, indicating the composition of each precious stone. There are many illustrations other than the colored plates, the work of Messrs. L. Prang & Co., of Boston. Orders can be filled at the subscription price direct from this office.—*American Grocer.*

THE NEEDLE-AND-THREAD TREE.

Imagine the luxury of such a tree, and the delight of going out to your needle-and-thread orchard and picking a needle threaded and already for business. Odd as it may seem to us, there is, on the Mexican plains, just such a forest growth. The tree partakes of the nature of a gigantic asparagus, and has large, thick, fleshy leaves, reminding one of the cactus, the one popularly known as the "prickly pear." The "needles" of the needle and-thread tree are set along the edges of these thick leaves. In order to get one equipped for sewing, it is only necessary to push the thorn or "needle" gently backward into its fleshy sheath, this to loosen it from the tough outside covering of the leaf and then pull it from the socket. A hundred fine fibres adhere to the thorn like spider webs.

By twisting tho "needle" during the drawing operation this fibre can be draw out to an almost indefinite length. The action of the atmosphere toughens these minute threads amazingly, to such a degree as to make a thread twisted from it, not larger than common No. 40, capable of sustaining a weight of five pounds, about three times the tensile strength of common six-cord thread. The scientific name of this forest wonder is *Tensyana mucadina.*—*St. Louis Republic.*

AN ENTERPRISING GROCER at Petersburg, Virginia, has hit upon a somewhat novel plan for taking orders from his customers. He sends to different residences each morning tame carrier pigeons. Small order slips with a loop on the end of them are furnished the customers, and on one of these is written the order. The loop is thrown over the bird's neck and it sails back to its owner. After all the birds have returned the orders are at once filled by delivery wagons. The scheme works admirably.—*Farm Journal.*

AFRICAN FEVER AND THE BLUE GUM TREE.—Dr. J. Croumbie Brown, with his customary zeal, has compiled some particulars relating to the culture of the Eucalyptus in Italy, and its effects in ameliorating the climate. The results obtained are such as to warrant the culture on a large scale of the Eucalyptus in the malarious parts of tropical Africa. From experiments made and calculations based on them it is shown that the leaves of these plants evaporate double or treble their weight of water, and even a much larger quantity. The trappist monks who formerly could not sleep without risk of life in their monastory in the Pontine Marshes, but betook themselves every evening to a convent in Rome, can now remain at their monastery of Tre Fontanes, with little risk, and the peasantry who were formerly obliged to migrate to the mountains in summer now reside on the Campagna all the year round. This improvement has followed upon the extensive plantation by the monks of various species of Eucalyptus.—*Gardeners' Chronicle*, Sept. 6th.

TROPICAL PRODUCTS IN BRITISH NORTH BORNEO.—The information given by Mr. W. D. Gibbon in his letter elsewhere regarding the cost of and profit from a Liberian coffee estate in British North Borneo is interesting, but we fear of no practical value to Ceylon planters,—Liberian coffee being now little more than a name in our island. The pamphlet which accompanies the letter consists largely of extracts from letters and reports that have appeared in the *B. N. B. Herald*, and which we have extracted from time to time; to which are added land regulations and rainfall and other tables.

HOP TEA: A NEW INDUSTRY IN KENT.—There is at last some hope for the unfortunate hop growers who for so many years past have been carrying on their business with the figures on the wrong side of the ledger. Hitherto they have only had one outlet for their produce, but in future they will have a choice between the brewers' mash tun and the British housewife's teapot. A company has been floated for the manufacture of the hop tea, to be blended with some of the stronger qualities of the Assam and kindred sorts. In view of the approaching hop-picking season, the company have acquired the large riverside premises belonging to Mr. E. S. Tapply, near Maidstone Bridge, where the work of drying and preparing the hops for conversion into tea will be carried on. Already 700 casks of the mixture have been disposed of in the tea trade, and the "brew" is highly spoken of by those who have tried it. A Maidstone grocer has, it is stated, given an order for a ton of the hop tea, and it is expected that the commodity will command a ready sale on the market. The premises are, we are informed, being fitted with the necessary enginery by a local firm of engineers, and in the course of a few week it is hoped that the new industry will be in full operation, and thus add another important branch to the commerce of the county town.—*Sussex Express*, Aug. 26th.

OPIUM-DRINKING IN ENGLAND.—The use of opium is alluded to after a rather too trifling fashion in the story (fictitious of course) reproduced in our *Household Register* today. Our readers are aware how serious an evil the addiction to opium in the shape of laudanum drinking, has become in the Fen districts of England, and about Gravesend and other low-lying parts. We have shown how great a boon quinine ought to be in these cases: that is for example, if every clergyman and philanthropist in the Fen districts got the people suffering from ague, to try quinine in place of laudanum. The opium practice we refer to is of long standing and it may be worth reproducing the paragraph in which (in Charles Kingsley's "Alton Locke") "Varmer Porter" enlightens Alton, during their drive to Cambridge, on the meaning of "a penn'orth of elevation":—

Varmer Porter:—'Love ye then! they as dinnot tak' spirits down thor, take their pennord o' elevation, then—women-folk especial.'

'What's e levation?'

'Oh! ho! ho!—You goo into druggist's shop o' market-day, into Cambridge, and you'll see the little boxes, dozens and dozens, a'ready on the counter; and never a ven'man's wife goo by, but what calls in for her pennord o' elevation, to last her out the week. Oh! ho! ho! Well, it keeps women-folk quiet, it do and it's mortal good agin *ago* pains!

'But what is it?'

'Opium, bor alive, opium!'

'But doesn't it ruin their health? I should think it the very worst sort of drunkenness.'

'Ow, well, yow moy say that—mak'th 'em cruel thin hen, it do; but what can bodies do i' th' *ago*? Bot it's a bad thing, it is.'

CEYLON TAMIL COOLY MISSION.

Many who have supported this Mission seem to be growing weary of doing so, and many more wholly decline to help at all, giving as a reason that we are doing no good. I am far from endorsing this statement; but I am as far from satisfaction concerning results as any real friend of the Mission who desires to see souls converted to Christ and His Kingdom extended. I realise more and more that the best efforts of man will accomplish nothing apart from the immediate presence of the Lord Jesus and the power of the Holy Spirit. But I think with many others that the time has come for making some new plans to bring the Gospel message to the coolies. For this purpose I am about to start an associated band of Evangelists, whose aim will be to carry the good news to as many as can possibly be reached. They will visit estates, preaching and teaching in the lines, and holding meetings wherever they are invited or permitted to go. They will also conduct prayer and revival meetings amongst the Tamil Christians. The great object of these meetings will be to show to the nominal Christians as well as to the Heathen that Jesus is a Saviour who is able to save, and that when He saves, righteousness, truth, love and purity are the result. We believe that Jesus does this, and that He will do it. Therefore we confidently appeal for help. I have two or three men into whose hearts God has put a loving strong desire to preach a full Gospel to their fellow-countrymen and women. I need special funds for supporting them. I need also help to build a commodious house for the associated workers to come to for rest as a centre. This must be near to myself at Lochiel, so that I may meet them as often as possible. We have a good school at Wootton where they may work whilst resting. I purpose building their house on to the School room which also needs rebuilding. A few musical instruments are a great help in itinerating preaching—these must be bought. I am not without hope that God will give me one or two young Englishmen whose hearts He has kindled with love to the Saviour, who will lead and work with these Native brethren under my general direction. I myself am too old to be the leader in the field, but as far as duties and strength allow, I hope not only to say to them go, but also to say come. God is enabling me to believe that He will do greater things than we have seen of late years. We will put no confidence in an arm of flesh, our trust is in the Lord; He is the God of Salvation. We believe we shall yet join in singing the 98th Psalm. Any help for this new effort, independent of that given to the General Funds of the Mission, will be thankfully received.

J. D. SIMMONS.

Lochiel, 15th September 1890.

DANGER IN WATER FILTERS.—The old charcoal and gravel filters, which once had the entire confidence of families and physicians as entirely efficacious in purifying drinking water, have been recently found to be not only of dubious character, but even in cases to aggravate the danger which they were expected to allay. The investigation of the Rhode Island Medical Society seems to show conclusively that the meshes and interstices of the filtering matter become clogged with the deleterious organisms of the water, and that these increase in number when the filter is not in use, standing in the warm air of the kitchen. In one examination by this Society unfiltered water containing thirty-six colonies of organic growth increased to 10,000 after filtration. The danger of the filter seems to lie in the impossibility of cleansing it. A simple way of purifying the water is to boil it freely for ten minutes. Then pour it into a broad earthen dish, in the open air, where it can cool away from any chance of contamination. The water thus prepared may be kept in a stone jar in a cool cellar for four or five hours at a time, and when cooled with pure ice is a good substitute for spring water where spring water cannot be obtained, and it is probably as harmless as this gift of bounteous nature can be rendered in the restrictive environments of a large city.—*New York Tribune.*

CINNAMON AND COCONUTS.—Kadirana, Oct. 3rd.—There is a change in the weather, and light showers have fallen during the last few days, yesterday's fall being 0·53 of an inch; till more comes this will at least cause the grass to grow and give food to the half-starved cattle.

TEAMEN will be interested in the following telegram:—"Chicago, 29th July.—Ernest Theodore, a prominent tea exporter from Hankow, China, is in this city. In speaking of the tea commerce Theodore said: 'The recent passage of the Silver Bill raised the price of tea 10 per cent. We make all our payments in silver out there, little gold being used. The purchase of 4,500,000 ounces of silver a month by our Government is equivalent to taking out of the market just so much that was hitherto available. The eastern markets have felt this influence, and silver in London has risen in price. The tea crop in China is heavy this year and of prime quality.'"—*N.-C. Herald*, Sept. 5th.

CULTIVATION OF TOMATOES IN ENGLAND.—At a conference of the British Fruit Growers' Association, held at Brighton yesterday, it was stated by one of the members that from the two stations of Worthing and Lancing, during the three summer months, 35 tons of fruit were despatched by rail weekly, and for the remainder of the year six tons per week, making 663 tons of fruit during the year. Of this amount, 350 tons were tomatoes, the remainder being grapes, cucumbers, apples, &c. The value of the tomatoes at 5d. per pound was estimated at £20,000, and the other fruit at £14,000, making a grand total of £34,000 from the Worthing district alone. Other speakers maintained that the industry was not fully developed, and that for a long time to come the supply of English tomatoes would not exceed the demand.—*Globe.*

DARJEELING.—Tea is, of course, going on in the even tenor of its way, and it appears as if, although the nights are getting markedly colder plucking would be kept on until about the middle of November—on a small scale of course. Taking into consideration the long drought at the beginning of the year tea gardens in the hills do not seem to have done so badly after all in the hills, and the rise in prices has been decidedly encouraging to planters generally. What effect the improved exchange will have on Calcutta prices of course remains to be seen. I have always been given to understand that a low rate of exchange always meant good prices for Indian productions of all kinds. Here is another problem which will need solving later on. What effect will the gold finds in the centre of India have on tea prices in the future? This is a question which I leave others to solve, as it is quite beyond me.—*Indian Planters' Gazette*, Sept. 16th.

WHOLESALE DESTRUCTION OF FISH.—Colonel Campbell Walker, Conservator of Forests, Southern Circle, Madras, recently brought to the notice of his Government the wholesale destruction of fish in rivers. In the Bhavani river the main and subsidiary streams are dammed up and the fish destroyed by dynamite, or the water baled out and fish, both large and small, taken and sent into Mettupalayam in bullock and cart loads; and as a similar practice is followed in almost all rivers, it would ultimately tend to the extermination of fish in the rivers of southern India, as by the above system both fish and fry are destroyed. It is under contemplation to alter the rule in the Madras Forest Act which permits "the catching of fish by the damming or baling of water" by a proviso that "the Collector may attach such conditions to the issue of the permit as he may consider necessary." This would only affect fishes in rivers running through reserved forests, and it is incumbent on Government to adopt some legal measures to regulate the wanton destruction of fish and fry, such as their capture only by the net and rod, the meshes of the former being regulated to such a size that fry may not be taken.—*Pioneer*, Sept. 18th.

CINNAMON, CINCHONA BARK AND CITRONELLA OIL AT THE LONDON DRUG STORES.

In the *Chemist and Druggist* of 26th July is an interesting paper entitled "Through the Drug Show-rooms," in which a description is given of the new drug show-room at the Crutched Friars warehouses, where the sales are now held. We extract the following portions, which relate to Ceylon productions:—

CINNAMON AND SPICES.

At the London and St. Katharine Docks huge supplies of drugs and gums are stored amid still larger quantities of wool, coffee, wheat, wine, and other commodities. The first warehouse which appeals particularly to druggists is "No. 6," situated immediately to the right of one of the principal entrances. Two floors of this huge building are devoted to the storage of spices—one contains cinnamon, and at the top floor immense quantities of cinchona bark may be seen. There are very rarely any "shows" of drugs or spices at these warehouses. They are situated too far to the east of Aldgate Pump—that Ultima Thule of London City—to be easily accessible to the busy City man, and when, some time before the closing of Fenchurch Street warehouse, it was suggested in an unofficial sort of way that the drugs might in future be shown at the Docks, the opposition threatened to this project on the part of the druggists was strong enough to cause the Dock Company to relinquish the idea—if they had ever entertained it seriously—pretty promptly. The cinnamon floor of "No. 6" warehouse is a much less interesting place now than it was before the cinnamon trade entered upon its present period of decline. Cinnamon is imported from Ceylon in canvas-covered bales about four feet in height, and packed with considerable care. Exceedingly thin quills of the spice are placed one within the other until they form a long and compact, though brittle reed or stick. A large number of these sticks are packed together in a roll, or bale, and upon their arrival in the warehouse they are sorted, re-packed, and classified in four different grades, according to thickness, the thinnest bark being the best. Besides these four varieties of whole sticks, the broken sticks are sold separately—mostly to druggists. Cinnamon "chips"—which, are, or were, exported separately from Ceylon in large quantities—are the small shoots removed from the long quill bark when it has been stripped of its leaves. They are very largely used for the distillation of essential oil, but the recent combination of cinnamon growers in Ceylon has placed a veto upon their export, on the ground that their extensive sale spoils the European market for the more valuable product. In the spice floors Zanzibar cloves take up an immense amount of room, the stock of that article being at present very large. The Zanzibar cloves are imported in fibre-plaited mats or bales known sometimes as "gonjes," of about 140 lb. weight. They are much darker and smaller than the cloves imported from Penang and Amboyna, but so far as commercial importance goes, the latter are now-a-days very insignificant. Nutmegs, mace, cassia, and cassia buds are also stored in considerable quantities in this warehouse, and on certain days the air is heavy with the odour of the spices which are being repacked, sorted, and sifted to render them suitable for the European market.

CINCHONA.

The bark floor is now mainly occupied by Ceylon and East Indian barks, which are usually packed in oblong canvas bales, weighing from 200 lb. to 300 lb. into which the small chips or shavings—in which the bark is now almost always sent over—are tightly packed by hydraulic pressure. The bales usually bear on the outside the name of the plantation and some mark indicating the species of the bark and the character of the contents, whether in shavings or chips, original or renewed. The barks intended for "pharmaceutical use," as distinguished from those more particularly adapted for use by the quinine manufacturers, are sent over in cases of varying weights, that mode of packing being resorted to the better to shield the quills against breakage, and to prevent the moss with which they are frequently overgrown, and which adds to the value in the eyes of many purchasers, from being crushed or torn off. The South American "seron" of bark is not so often seen now as formerly, but it is the most characteristic form of package. The hide serons are usually light—from 1 to 1¼ cwt. being the general range—and consist of undressed cowhide. The serons are usually provided with handles made of small strips of hide, by which the packages are slung across the backs of the mules, which are the chief if not the only, means of transport across the rough paths of the Andes. Some of the South American quill barks frequently flavoured strongly of the smoke of the fire over which in their rude way the "cascarilleros" were wont to dry them. Other quills again possessed an earthy flavour which they acquired from the soil upon which they were roughly thrown to be dried by the heat of the sun. The original flattered bark from the South American forests, the "Cortex China Regia," is now very seldom met with in commerce. It was mostly bought by French firms, and is generally thought to have been employed principally as an ingredient in a remedy against drunkenness, and in tooth-powders. There is still in the warehouses a large supply of the Cuprea, Pitayo, and soft Columbia barks, which were imported in huge quantities some ten or twelve years ago, and in making his way out of the building the visitor passes through alleys between immense piles of packages of cinchona of all varieties.

ESSENTIAL OILS.

East Indian sandal-wood oil arrives here in huge copper pots, protected by a strong netting of rope-work. A pot usually contains about twenty gallons of very turbid oil. The oil is therefore emptied from the pot into large copper "jacks," or vats, about 5 feet high and quite 3 feet in diameter, and left to settle. The "jack" is provided with two taps—one, about 12 inches from the bottom, being used to draw off the clarified oil, while the lower tap allows the thick dregs to run out. The latter are sold separately. Indian rose-oil is treated in the same manner, and so, in fact, are many other essential oils stored at this warehouse. Rose-oil is imported in metal drums provided with a handle and a bunghole at the top. These tins—usually old kerosine tins—are used for packing quite a large number of Eastern drugs which come into this market. In close proximity to the oils is found East Indian nutmeg-paste, in tins weighing about ½ cwt. each, four or six of which make up an original case. Cinnamon sawdust is often used for stuffing between the bottles or other breakable packages in the cases of essential oils. Citronella and lemongrass oils were formerly imported almost exclusively in bottles of about 21 oz. each, 24 or 36 in a case. Under this mode of packing they were liable to considerable damage, and recently an innovation has been introduced by the importation of these important articles in 5-lb. tins. Quite lately the oils have been shipped in so-called "tanks"—heavy iron casks protected and kept from rolling about by a strong wooden crate. The tanks have evidently been sent to Ceylon as containers for a different liquid, and are returned to us filled with oils.

COFFEE GALORE!

Who says coffee is dead in Ceylon? Up and down in Uva this year, there is an experience of blossom and a promise of crop sufficient to prove the contrary. The way in which native coffee is bearing and blossoming in the Principality astonished Dr. Trimen we learn, and we ourselves saw most satisfactory evidence of good crops to come all along our route, more especially in Haputale where we were just too late to see a whole countryside white with blossom. But there is also crop on the trees nearly ready for picking, and we have brought back from New Galway, a couple of primaries as a specimen of crop on Mr. Kellow's fine little Albion property, which ought to be a cure for the "sore eyes" of the V. A., whose sight got

damaged trying to see and estimate any coffee berries for his employers! On one of these branches no less than 954 coffee berries have today been counted. Mr. Kellow and some of his neighbours are believers in the old Uva system of cultivation *without pruning*, and certainly the result in the case of Albion seems satisfactory. Of course there is liberal cultivation otherwise; and indeed if coffee planters anywhere in Ceylon expect crops in these days, there must be a liberal reliance on manure as well as on Providence.

UVA AND HAKGALA GARDENS, &c.

The Director of Botanic Gardens (Dr. Trimen) accompanied by Mr. Nock of Hakgala, has been on a visit of inspection to the Badulla Garden, which we can testify to be a very pleasing addition to the amenities of the capital of Uva, and in itself—considering the soil and situation—a wonderful success reflecting credit on the Department. Dr. Trimen returned via Haputale and Horton Plains where the successful growth of plants put out there was noted—and others are to be sent. Some new or rare plants were collected by Dr. Trimen and Mr. Nock during the Horton Plains expedition; and the former has been much pleased with the progress made in the various experiments at Hakgala Gardens, where the new vegetables, fruit bushes and trees are giving satisfaction. Apples and pears have been produced with a flavour far superior to that of any yet grown in Ceylon. All the fruit trees are for the present, "resting." As for potatoes, we have some specimens of the "fourth generation" from the seed brought by Mr. Nock from England, and they weigh up to over 1 lb. each, and are perfectly healthy. To other features of the Gardens we must refer later on. Dr. Trimen returned to Peradeniya on the 19th instant. It would be well if every province, and indeed revenue district, had its Experimental Garden, subject to the oversight and inspection of the Director and his Assistants.

THE LATE EXPERIMENTS WITH MANA GRASS FAILURES.

During the week it has been possible for me to read over the reports made by Messrs. Ibotson and Dr. Evans relative to the late trials made of mana grass, respecting the progress of which you have been kept fully informed by me. That by Messrs. Ibotson is certainly very discouraging, all the attempts made by them having been failures. There are, however, very curious facts relative to the trials made which lead us to the conclusion that very probably a mistake has been made somewhere or other which would sufficiently account for the disappointing results as yet reported. Dr. Evans, after personally witnessing the later trials made by Messrs. Ibotson, took away with him some of the grass which had formed the basis of those trials. This he tested in his own laboratory, and found that the product of his endeavours differed wholly and entirely in its character from that he obtained when testing the first lot of mana grass. You will recollect that the sample sent you by me of the result to that first testing—and as to which Dr. Evans reported most enthusiastically—was an eminently strong and fibrous paper. The outcome of the trial made by that gentleman with the second lot of grass received was identical in character with what was obtained by Messrs. Ibotson, namely a dusty weak paper which would scarcely bear handling in pieces of only a few inches square. Indeed the specimens produced of this broke with their own weight and were absolutely worthless. Now the question consequently arises, What can account for the vast difference between the results to the two trials?

Dr. Evans inclines evidently to the view that the two lots of the grass obtained, differed altogether in character. Whether this difference be due to the different localities in which the grass was grown, or whether it may be owing to the different conditions of age or ripeness at which it was plucked, the expert professes himself unable to say; but he suggests both explanations of the very striking contrast between the results obtained. To my own mind it occurs as possible that the second lot of grass received was not mana grass at all, but citronella grass. To a great extent, this possibility is based upon a fact mentioned by Dr. Evans in his report that, during the boiling operation, the grass gave out a very powerful odour of citronella. Whether that oil may be to some extent contained in mana grass is not known to any of us. At all events, that the reputed mana should give out such a scent is a circumstance worthy of every consideration in estimating the gravity of the conclusions to which we have been forced by the ill-success which has attended the working of the shipment of grass specially sent home for these trials. The first lot of the grass dealt with was but a small parcel, and was obtained from Mr. J. L. Shand. The second—in quantity some fourteen hundredweights—was obtained by Mr. Kelly in Dikoya, but I am as yet uninformed whence Mr. Shand obtained his supply. Anyway, there is a radical difference between the two lots of the raw material which have hitherto been tested. Of the first Dr. Evans spoke in terms even more highly commendatory than he permitted himself to use in his written report, and no one is more astonished and disappointed than himself at the result to the larger scale trials lately undertaken. As yet there has not been sufficient time for the Stanley-Wrightson Syndicate to determine what the next steps to be undertaken by it shall be. Probably the endeavour will be made to obtain the judgment of expert botanists upon the character of the two lots of grass. That such great diversity should be found as the result of the treatment of these is most perplexing, and certainly lends colour to the idea that they must have been radically different in character. If the examination by competent botanical knowledge should decide that such difference is marked, it will be vital to future success that a larger quantity of grass, plucked at different stages of growth and from different soils, should be obtained from Ceylon. I hope when writing next to have learned more conclusively what has been done, or is in contemplation, with respect to this matter.—*London Cor.*

NOTES ON PRODUCE AND FINANCE.

ARE THE CHINESE LIKELY TO ADOPT NEWER METHODS IN TEA CULTIVATION.—As the Chinese will have to take rigorous action of some kind if they are to retain a tea trade of any importance, the question arises, will they cultivate with more care and adopt newer methods of manipulation in manufacture? The British Consul at Canton hints at this in a recent report when he says: "From observation of the tea plantations in the immediate neighbourhood, the quality of the teas might be considerably improved if a little more care was devoted to the cultivation of the bushes, and if foreign appliances for drying the leaf immediately it is plucked were introduced, for the plantations seem utterly neglected, and much leaf is ruined while on its way to Canton to be fired when it chances to be rainy weather." But he also says, and this adds to the hopelessness of the outlook for the Chinese,

"The weight of taxation to which they are exposed, and which there seems little possibility of hope of reduction, renders it impossible for them to compete with Indian and Ceylon teas in their chief recommendation—cheapness."

COTTON CULTIVATION IN CENTRAL ASIA.—In order to develop the cultivation of cotton in Central Asia, the Russian Minister of Finance has ratified the project of leasing 60,000 deciatines of land (about 162,000 acres) in Turkestan to the Commercial and Industrial Company of Central Asia in order that it may form plantations of cotton there. The *Journal de la Chambre de Commerce de Constantinople* states that the lease is for ninety years. The company has the privilege of growing, besides cotton, all other plants; it is exempt from any rent during the first fifteen years of working. After that period it will have to pay a rent which will be equal to the land tax collected on Turkestan territory.

A NEW COFFEE SIZE.—The Americans are using a mixture for sizing coffee which may be effective but it is not nice. According to the *Grocer*, its active ingredients consist of common or condensed milk, ground or powdered glue, glycerine, refined lard, and in some cases, bicarbonate of soda, fine table salt and vinegar. The latter only affects the gloss or polish of the roasted coffee in keeping down too high a polish. The action of the bicarbonate of soda is said to keep all these heterogeneous ingredients "sweet." In preparing the coffee for the "size" it is first roasted dry, and allowed to cool somewhat; the mixture is then added in such proportion and in such a manner that each berry gets a thin coating of varnish. It is claimed that by this process the berry is hermetically sealed and the pores completely closed up, thus preventing the aroma from escaping, and so preserving the full strength of the coffee. No moisture can penetrate through the varnish. Further, when the coffee is being made in the pot the "size," it is claimed, acts in such a way that the "grounds" are caused to settle rapidly, so nothing is needed to be added to the liquor to "clear" it. The natural flavour is not modified, and it is stated that the caffeine or active principle of the coffee is reserved to the fullest extent.

THE TEA DUTY IN AMERICA.—We learn by cable from New York that the majority of leading American tea dealers have forwarded to Washington a protest against the section in the McKinley Tariff Bill which provides for a ten per cent. *ad valorem* duty on teas, the produce or growth of countries east of the Cape of Good Hope, when imported to America from places west of the Cape of Good Hope. The protest declares that the section is avowedly intended to retaliate against Canada, but is in reality aimed at the London markets, on which the United States depend for Indian and Ceylon teas, England being the only convenient halting place between the East and the States. It is further stated that the section is really the scheme of a few big dealers to monopolise the United States market.

THE PRODUCE CLEARING HOUSE AND INDIAN TEA.—As mentioned by our Special Commissioner last week, it was resolved, at a recent meeting of the Produce Clearing House Tea Committee to definitely commence business in Indian teas on January 1st, 1891, and, as soon as the experts have been appointed, the types of quality will be chosen and circulated amongst the trade.

ALCOHOL AND TEA.—The following interesting paragraph is going the rounds of the papers. It is not a new form of conundrum, although it reads very much like it:—"A series of physiological experiments is being made by Dr. Kraeplin as to the respective effects upon the mental powers ("psychical reaction") of alcohol and tea. By this finding alcohol diminishes ideas and strengthens the verbal association of words and the association of auditory impressions. But as to tea, he finds that it favours the association of ideas and intellectual work, while embarrassing the association of words."

PLANTING IN JAVA.—The financial statement for Java will shortly be submitted to the Dutch Chamber. It is expected to show a large deficit, the amount being named as twenty millions of guilders. Last year the crops in Java were very poor. Most of them suffered from blight, and the yield was much below an average amount. Many planters came out well owing to the comparatively high prices of sugar and coffee. Others suffered severely, however, and the rice crop was not more than "middling." The native population in Java is undoubted very poor, and it is burdened with heavy taxation. This is the real trouble in Java, and nothing but very good crops can make the people at all prosperous.—*H. and C. Mail.*

SIR CHARLES BRUCE ON INDIAN LABOUR EMIGRATION.

Sir Charles Bruce (in the *New Review*) gives an able and interesting history of the emigration of labour from India, specially to the West Indian colonies and Demerara, since the period when the abolition of slavery rendered necessary supplies of men able and willing to work *regularly*. Sir Bartle Frere is quoted as stating in 1873 that

"The Bengal labourer with wages at 1½d or 2d a day, and no roads or canals to bring him food, is always terribly near the brink of starvation"; and again, "Though I believe the existing population of India is, as a mass, better fed than it was forty years ago, still there are large masses, especially in Bengal, living on the limits of starvation."

The testimony of Mr. Grierson, an officer deputed by the Government of India to inquire into the system prior to the passing of the Indian Emigration Act of 1883, is as follows:—

"The Colonies importing Indian labour are in the belt of the Tropics. The only exception is Natal, which is sub-tropical. The conditions of life in these Colonies are much the same, viz, an equable climate, free from sudden or extreme variations, and an amazing fertility. The original natives of these countries, living for generations where life without labour was easy and pleasant, have developed into a type of human beings peculiarly unfitted for the higher forms of cultivation of the soil. When, therefore, European enterprise attacked these countries with the hope of carrying off the richer products of the earth, the indigenous natives were found unsuited for aiding them in the work. Coolie labour had accordingly to be introduced; and the only places where suitable labour was found to be available were India and China. Both these countries are subtropical, the greater portion being outside the tropical belt. Here the conditions of life are very different. The climate is anything but equable, and is subject to sudden and extreme variations. At one time the country is deluged by rain, at another parched for months together. Here life is impossible without labour. The most elaborate precautions have to be taken to obtain even a probable chance of raising a moderate crop; and the result is that the inhabitants of India and China have, in the course of generations, developed into human beings possessing considerable agricultural skill and a wonderful capacity for continuous hard work. The Indian's whole life is one long labour—he never has a moment's rest. . . . When an Indian coolie is transported to a tropical Colony, he finds himself in a place quite beyond his experience. He finds a soil capable of yielding good crops with hardly any cultivation, and he naturally applies to it all the labour and all the skill and industry inherent in him. The result is an out-turn such as would be impossible in India, and such as he had never even dreamed of before. Subsequent experience confirms his first impressions, and he rightly considers that he has found a place free from cholera and famine of a warm equable climate, where his natural industry, if rightly applied, make its possessor in a few years the owner of a large fortune."

This is the sensible view of the case; and what remained for the Indian Government to do was to secure the well-being of their subjects *en route* to and while employed in the scenes

where they sold their labour for wages, but did not sell themselves into slavery, as some of the former slaveholders, especially those in the French Colonies, were too apt to think they had done. Sir Charles Bruce states :—

It was only after long experience and many years of tentative experiments in the passing of regulations that the Home and Indian Governments were satisfied that the introduction of Indian labourers into our Colonies conduces as much to the welfare of the emigrants as to the general prosperity and commercial wealth of the Colonies.

Many of our readers will recollect the Commission of Inquiry which was sent to the very Colony from which Sir Charles Bruce now writes, of the results of which Mr. Jenkins, the author of "Ginx's Baby," gave so fair an account. Emigration to British Colonies was not only continued but encouraged, while the persistent cruelty and injustice of the planters in French Colonies deprived them of the benefits of this form of labour. After showing that the conditions of emigration to the Straits and Ceylon are essentially different to those applying to the more distant Colonies, the writer proceeds to give a summary of the conditions which apply to the latter. We quote a passage which shows that the cooly who earns wealth in one of those *eldorados* is not permitted its free enjoyment in his own country :—

The wealth of the returned emigrant often excites the cupidity of his neighbours, and unless he can soon find a good investment, the attempts to get money from him under various pretexts, such as caste dinners, &c., and even by theft, become burdensome, and so many re-emigrate, after a few months, fairly disillusioned with Hindustan.

The conditions under which Indian emigrants are generally employed are thus summarized :—

Generally the period of indenture is five years. In some Colonies coolies are allowed to reindenture, in others their industrial residence, as it is termed, terminates at the end of the original period of indenture. Everywhere the coolie is entitled to a free dwelling and garden ground, and it is the constant care of the Government that all needful requirements of accommodation, ventilation, and sanitation shall be observed in the construction and maintenance of his dwelling at the cost of the employer. The rate of wages varies according to the nature of the work, which includes the cultivation of the soil and the manufactures of the mill. The minimum daily wage for able-bodied adult males is generally about one shilling. There are many kinds of work at which larger wages can be easily earned when the immigrant has had practice and experience. In some Colonies wages are partly paid in rations, and in all arrangements are made for the rationing of coolies in certain circumstances. The hours of work vary generally from five to ten hours, according as the work is in the field or in the factory buildings. Where task work is set, an able-bodied adult can earn the minimum wage well under eight hours. The indentured coolie is always entitled to medical care and maintenance during sickness. The hospitals provided in the Colonies for the accommodation of the coolies place them in times of sickness in a position of singular advantage as compared with agricultural or urban labourers in Europe. Return passages, when claimable, are given generally after a continuous residence of ten years, five years having been passed under indenture. Such passages are claimable in the case of all the more distant Colonies, but a comparatively small proportion are claimed. As the Indian population in a Colony grows, as children are born and families become bound to the Colony by new ties, each succeeding generation becomes more and more firmly rooted in the soil. Of those who do return to India, a large number bring back their friends and relations to the land of their adoption

Sir Charles Bruce proceeds :—

The Imperial interests concerned in the system were broadly stated by Lord Salisbury in a despatch to the Government of India of the 24th of March, 1875, in which he said: "Having regard to the greatness of our Indian population, and to the probability that under the protection which the British Government affords from depopulation by war, and, as far as possible from famine and other evils, that population must continue very greatly to increase—especially in the healthier and more densely populated parts of the country, where the numbers already press on the means of subsistence, and the lowest classes are at all times little removed from want—it appears to me that, from an Indian point of view, it is desirable to afford an outlet from these redundant regions into the tropical and sub-tropical dominions of her Majesty, where people who hardly earn a decent subsistence in their own country may obtain more lucrative employment and better homes. While, therefore, from an Indian point of view, emigration properly regulated and accompanied by sufficient assurance of profitable employment and fair treatment seems a thing to be encouraged on grounds of humanity, with a view to promote the well-being of the poorer classes, we may also consider from an Imperial point of view the great advantage which must result from peopling the warmer British possessions, which are rich in natural resources and only want population, by an intelligent and industrious race to whom the climate of these countries is well suited, and to whom the culture of the staples suited to the soil and the modes of settlement and labour are adapted. In this view also it seems proper to encourage emigration from India to Colonies well fitted for an Indian population. Under extraordinary circumstances—such as famine, flood, or other great calamities, when large numbers of the poorer classes are deprived of the means of subsistence, or are left without house and home—the Government officers might themselves engage emigrants for those Colonies which have agreed to receive people recruited under such circumstances."

Lord Salisbury deserves all credit for his large and statesmanlike views of what is best for the Indian Empire, for the British Colonies and for the Indian labouring classes, who are in their own country multiplying beyond the means of existence. As Mr. Grierson wrote :—

"Surely emigration may be looked upon as an engine of immense power for good to India. The more safety valves there are for a pent-up population in time of famine the greater chance there will be of saving life; and, if I may venture to offer an opinion on such a point, I maintain strongly that it is Government's imperative duty to actively encourage emigration by every legitimate means in its power, and to let it be known far and wide that the Emigration Department is a Government one."

Sir Charles Bruce adds :—

It may be said that up to the time of the passing of the Emigration Act of 1883 the Government of India tolerated the system as a favour to the Colonies, while from that date it has actively encouraged it as a power for good to India.

And now comes the portion of Sir Charles Bruce's paper which will be read with most local interest, from the frank testimony he bears to the courage and enterprise of the Ceylon planters. We are also grateful for the terms in which he recognizes our own efforts to help forward the enterprise on which the prosperity and progress of the Colony depend and which has rendered it famous wherever "the cups that cheer but not inebriate" are prized.

As a homely but none the less important illustration of the Imperial interests concerned in the successful conduct and expansion of emigration from India, may be pointed out its effect upon the cheapness and abundance of the commodities of the breakfast table. So far as the production of these commodities in British possessions is concerned, it may be said that the possibility of their remunerative cultivation depends upon immigrant labour. In the year 1878, when I became officially connected with the Island of Ceylon, the export of tea amounted to some 400 lb. ; the export of the present

year is estimated at 40,000,000 lb. The growth of the tea industry in Ceylon has been justly described as one of the wonders of the modern world, and to the courage and enterprise of its planters, supported by the intelligent force of the Ceylon *Observer*, infinite credit is due for results which nevertheless could not have been accomplished but for the cheap and efficient labour of emigrants from India. In the far distant province of the Empire with which I am at present connected—in British Guiana—the fortunes of the sugar industry have been no less dependent on emigration from India. Without this resource no capital would have been attracted to the Colony, no estates would have been maintained, and no sugar made.

The Indian labourers return not only with wealth but with expanded ideas and independent self-respect. Sir Charles Bruce adds:—

In a recent return furnished by the Emigration Agent-General in Calcutta for British Guiana, it is shown that since the year 1854 the number of emigrants who have returned from that Colony to India has been 30,433 (inclusive of a large number of children) who have taken with them remittances to the amount of £457,243. They have also taken with them jewellery of the estimated value of £55,000 since the year 1875, prior to which no returns of jewellery were collected. The amount standing to the credit of the Indian emigrants in the savings banks of the Colony exceeds £100,000. This represents but a small proportion of their savings, for the coolie is an astute money-lender, and his ideas of a fair rate of interest are based on the principle that a bag of rice borrowed at seed-time should be repaid by two at the time of harvest. I regret that I am unable to give an estimate of the value of property held in the Colony by coolies, but in 1871 the value of their cattle alone was shown by the Report of the Commissioners to exceed £130,000. They are rapidly acquiring substantial territorial interests. In British Guiana, and I believe also in Trinidad, there are among them prominent owners of racehorses.

We have quoted very largely, but we must add the conclusion of this able and interesting paper, in which it will be seen that Sir Charles Bruce contemplates not only the beneficial continuance of Indian emigration to such Colonies as that in the administration of which he holds so high a position, but also its extension to the vast new empire which Britain has acquired in Africa:—

In dealing with the subject of Indian coolie emigration in its bearing on the interests of the Government and people of India, and on the development of the territorial and commercial resources of the Empire, it must not be thought that I overlook the question of the influence of emigration from India on the resident labouring population of the Colonies. With this question it is impossible for me to deal within the limits of the present paper. I desire, therefore, that what I have said may be understood as referring to the emigration of Indian coolies to British possessions in which the population is admittedly inadequate to the development of their resources. For instance, the area of British Guiana considerably exceeds 100,000 square miles, and, when its limits are determined, will probably be found to be about equal to the area of the British Isles. Of this area only about 150 square miles, the area of the Isle of Wight, is beneficially occupied. The population is under 300,000. In countries thus or similarly circumstanced, it would be a waste of time to argue that the development of their natural resources, which, without immigration, is impossible, is for the interest of all. The late Sir Philip Wodehouse, when Governor of British Guiana, said that "Since he had come to the Colony he had endeavoured to continue immigration on such a footing as would do more good to all. His reason for so doing was simply because he believed that there was not a single class of the population of the Colony that was not vitally concerned in the continuance of immigration. It might be that every class did not derive equal benefit from the introduction of immigrants into the Colony, but it was clear that all derived benefit. He believed that the estates could not be maintained if immigration ceased. The mercantile community, if the estates were abandoned, would find a cessation of trade; the public funds of the Colony would be distressed, and public officers would lose their salaries and their occupation in life; the mass of the population of the Colony would also suffer, inasmuch as the necessary consequence would be the loss of all those social, political, and civil institutions which, in point of fact, constitute civilisation."

Apart from all consideration of the direct advantages which coolie immigration has brought to British Guiana, an ethnic and historic interest attaches to the transfer of the population of Asia to the continent of South America. The adjustment of the balance of area and population is a question worthy of the statesmen of the greatest Colonial Empire the world has ever seen; and now that the Government has accepted the policy of an active encouragement of emigration, and that experience has indicated the principles on which emigration can be conducted consistently with an equal regard for the interests of capital and labour, it may be conceded that the time has come for the Government of India, together with the promoters of the great commercial enterprises recently undertaken, to consider whether a field for the organisation of Asiatic emigration on a scale of magnitude is not open in the sphere of British influence in tropical Africa.

OUR STAPLE EXPORTS AND THE CLOSE OF THE COMMERCIAL SEASON.

Although the Chamber of Commerce no longer lay themselves out for making up the export returns for our staples to 30th September—their season having been altered to suit the calendar year;—yet it is of interest to see how the actual shipments in the twelve months expiring today and the estimates framed a year ago compare. We cannot pretend to give exact results; for the latest Chamber of Commerce return is only made up to the 25th and the last statement for 1889 very probably overlaps a little with the fresh one begun from 1st January. But supposing that these two elements of error about balance each other we should get figures somewhat like the following for the total exports in Season 1889 90:—

From 1st Oct. 1889 to say 30th Sept.

Tea	...	...	43,067,101 lb.
Coffee	...	...	90,263 cwt.
Cinchona Bark		...	8,694,452 lb.
Cocoa	...	...	16,842 cwt.
Cardamoms	...	...	320,994 lb.

If this result prove to be fairly correct as regards tea, Messrs. Rutherford and Scovell will deserve credit for coming so near the mark as 43 million lb. a year ago. But there may be one qualification to that remark in the fact that but for the temporary stoppage of immigration and the derangement of labour in mid-season, the tea exports would probably have been larger. But there is always some unforeseen contingency to take into account, and we think the tea result may be fairly compared with the following estimates:—

Tea Exports for Season 1889 90:			Estimates:
Mr. Rutherford and Mr. Scovell		...	43,000,000 lb.
Messrs. Somerville & Co.	...	...	42 650,000 lb.
Ceylon Observer ...	...	...	42,000,000 lb.
Messrs. Forbes & Walker	...	...	40,000,000 lb.

Then in respect of the minor staples, we are gratified to see how nearly our own estimates published on October 9th, 1889, have worked out. Here are the comparisons:—

		"Observer" Estimate.	Actual Shipment as above
Coffee ...	...	90 000 cwt.	90,263 cwt.
Cocoa ...	...	16,000 cwt.	16,842 cwt.
Cardamoms	...	300,000 lb.	320,994 lb.
Cinchona Bark...		7,500,000 lb.	8,694,452 lb.

A difference of 1,194,000 lb in bark may be considered very large; but we have the satisfaction of believing that our estimate was nearest the mark—in fact the highest framed so far we know—our contemporary of the "Times" for instance keeping to 6½ million lb., while he was also below us in coffee and cocoa.

As regards the leading native export staples we may mention the following— :

	"*Observer*" *Estimate.*	*Actual Shipments about.*
Coconut Oil ...	350,000 cwt.	307,349 cwt.
Plumbago ...	350,000 „	405,429 „
Cinnamon (Quills & Chips)	2,000,000 lb.	2,266,837 lb

We do not pretend that the figures for shipments are quite correct; but they are near as can be worked out from the Chamber's returns at present and must be fair approximations.

Above, we give an approximate reckoning of the total amount of our Staple Experts to the end of the season—which is now abandoned in favour of the calendar year,—as compared with the estimates put forth a year ago. The result is singularly close in the case of tea to the estimates framed by Messrs. H. K. Rutherford and A. E. Scovell, quite independently the one of the other. Our own estimates were not far behind, while in the case of coffee, cocoa, &c., they were as near as could be desired.

In regard to the season we are now entering on, although we reserve our more careful investigation and estimates for the calendar year, yet it may be of some interest to indicate roughly, to what extent we anticipate shipments between Oct. 1st, 1890, and 30th Sept. 1891. Here then are the figures for,—

"*Ceylon Observer*" *Estimates*:

TEA	51,000,000 lb.
COFFEE	80,000 cwt.
COCOA	17,500 „
CARDAMOMS	320,000 lb.
CINCHONA BARK ...	6,500,000 „
CINNAMON ...	2,200,000 „
COCONUT OIL ...	320,000 cwt.
PLUMBAGO ...	400,000 „

The way in which Tea exports have increased may be seen from the following return going back only 5 years:—

Season 1885 6 ...	7,170,329 lb.
„ 1886-7 ...	12,013,686 „
„ 1887-8 ...	20,755,779 „
„ 1888-9 ...	32 516 682 „
„ 1889 90 (about)	43,067,101 „
„ 1890-91 (Est.)	51,000,000 „

It will be observed that we have diminished the estimated annual increase this time, but this is in correspondence with a falling-off in the extent planted after 1886.

In regard to Coffee the figures run very sadly the other way:—

1885-6 ...	223 693 cwt.
1886-7 ...	180 429 „
1887 8 ...	136,295 „
1888-9 ...	86,440 „
1889 90 (about)...	90,?63 „
1890-91 (Est.) ...	80,000 „

Last year our estimate proved exactly correct. This season Haputale and some other parts of Uva are to have good crops, but we fear this will be counterbalanced by a falling-off on this side of Nuwara Eliya, and we doubt if our declining staple will even reach 80,000 cwt.

For Cocoa, the return is:—

	cwt.
1885-6	13,347
1886-7	16,638
1887 8	12,611
1888-9	14,461
1889-90 (about) ...	16,842
1890-91 (Est.) ...	17,500

The cocoa crop is a very difficult one to estimate although our last year's prognostication was exactly fulfilled, and we trust the moderate increase we specify will be realized.

Of Cardamoms, the shipments have been:

1885 6 ...	236,056 lb.
1886-7 ...	321,560 „
1887-8 ...	310,685 „
1888-9 ...	301,706 „
1889 90 (about)...	320 994 „
1890-91 (Est.) ...	320,000 „

Then as regards Cinchona Bark, although our estimate a year ago for season 1889-90, was the highest published, yet we were found fault with in several quarters for venturing so high; but the actual shipments give nearly 1,200,000 lb. in excess of our estimate! Our reckoning for the current season is based on the annual fall already experienced, more than on a vain attempt to judge of what bark is available for shipment, such depending almost entirely on the prices that may be offered. Here are the figures for shipments and estimate:—

	lb.
1885-6	15,364,912
1886 7	14,389,184
1887-8	11 704,932
1888-9	10,498,487
1889-90 (about) ...	8,694,452
1890-91 (Est.) ...	6,500,000

The low prices prevailing give no encouragement to cultivate cinchona, and unfortunately as Ceylon decreases her exports, those from Java are on the rise, so preventing the natural result of a lessened supply from this island.

In respect of Cinnamon, it was hoped that a great difference in the shipment of "chips" would be witnessed by this time, but such is scarcely the case, although for some years there has been a gradual decline: we trust the falling-off may be much more apparent by and bye. Here is the return:—

	lb.	lb.
1885-6 ...	1,629,548 *bales*; ...	548,037 *chips.*
1886-7 ...	1,793,893 „ ...	505,951 „
1887-8 ..	1,657,424 „ ...	496,887 „
1888-89 ...	1,857,865 „ ...	466,401 „
1889-90 about	1,830,422 „ ...	434,415 „
1890-91(Est.)	1,850,000 „ ...	300,000 „

In Coconut Oil, we have a varying and yet on the whole wonderfully steady export:—

	cwt.
1885-6	234,308
1886-7	304,478
1887-8	385,758
1888-9	327,430
1889-90 (about) ...	307,349
1890-91 (Est.) ...	320,000

Finally in regard to Ceylon's one mineral of commercial importance that appears among our staple returns—Plumbago—(although it is no secret how large and valuable is the quantity of precious stones dug out every year and quietly disposed of)—the export figures for Plumbago indicate a wonderful development of mining:—

	cwt.
1885-6	190,153
1886-7	234,473
1887-8	254,046
1888-9	379,290

1889 90	(about) ...	405,429
1890-91	(Est.) ...	400,000

We trust then that the season just entered on may be a busy and prosperous one for both European planters and native agriculturists and miners.

STAPLE EXPORTS FOR THE OLD COMMERCIAL SEASON.

We have now had our monthly export tables corrected at the Customs up to the end of September as follows:—

1889. Months.		Coffee Plantation. cwt.	Coffee Native. cwt.	Coffee Liberian cwt.
January	...	10,941	1,868	19
February	...	12,283	1,861	72
March	...	4,567	799	65
April	...	1,313	1,582	97
May	...	1.215	852	70
June	...	4,139	867	113
July	...	7,533	25	51
August	...	11,608	181	90
September	...	2,917	131	85
October	...	2 415	121	8
November	...	5,666	263	13
December	...	12,610	142	21
		77,207	8,697	707
1890				
January	...	19,857	966	258
February	...	16,615	131	82
March	...	10,463	666	497
April	...	1,578	1,380	401
May	...	3,056	726	734
June	...	4,803	524	255
July	...	6,797	256	194
August	...	4,324	42	207
September	...	1,920	314	87

1889. Months		Tea. lb.	Cocoa. cwt.	Cinchona. lb
January	...	2,663,041	3,915	1,076,700
Februar	...	2,089,615½	2,328	834,106
March	...	3,522,929	1,733	813,345
April	...	2,631,082¾	540	1,026,177
May	...	3,600,608	227	827,732
June	...	3,685 857	1,130	559,196
July	...	2,702,241½	1,210	365,758
August	...	2,729,904¼	1,553	1,035,451
September	...	1,604,147	412	659,977
October	...	3,030,324	45	675,818
November	...	2,615,628	274	735,903
December	...	2,847,231	5,262	715,562
		33,752,612	18,629	9,325,728
1890.				
January	...	3,293 325	3,905	520,311
February	...	3,156,583	2,111	741,815
March	...	3,407,883	1,937	796,090
April	...	4,122,827	1,338	699,921
May	...	4,791,586	906	874,650
June	...	4,996,417	633	617,942
July	...	5,256,538	1.077	658,982
August	...	3.400,975	697	978.762
September	...	2,944,883	83	610,847

Although there has always been a discrepancy between the Customs and Chamber's reckonings, it is of interest to see how the additions work out from Oct. 1889 to Sept. 1890 in the above tables. Here are the Results:—

Exports by Customs monthly report.

TEA .. 1st Oct. '89 to 30th Sept. 90	=	43,864,233 lb.
COCOA .. " " "		18,268 cwt.
CINCHONA BARK " " "		8,686,243 lb.
COFFEE:		
Plantation ..	.. 90,104	
Native ..	.. 5,436	
Liberian ..	.. 2,757	98,297 cwt.

In all these cases save Cinchona Bark, the Customs returns show higher figures than the Chamber's returns, for the exports.

LIGHT PLOUGHS FOR CEYLON

Trials of various kinds of bullock ploughs for use in India and Ceylon have taken place with more or less success, and at the present moment further reports on their use are looked for. The obstacles to their use are well known, and some, if not all, of these have been overcome; there is one, however, encountered in the prejudice of the native cultivators, which will require a long course of practical demonstration to overcome. The price has been brought down to almost the lowest possible limit, the means of repairing the simple implements manufactured by Messrs. J. & F. Howard are provided, and the amount of work done is excellent.

The Saidapet Plough is a very good and useful implement, but when tried against Messrs. Howard's Simbaleso Plough is found wanting, as testified by Mr. G. S. Williams, the then Government Agent, Kurunegala, who prefers the latter by reason of its extreme lightness and its capacity for cutting a better furrow. In South India a lighter plough has been introduced by Messrs. Massey & Co, of Calicut, and tried in a variety of districts with partial success. The Collector of South Arcot in reporting on these says he considers that their price is the great objection to the introduction of improved ploughs, and suggests that either Government should manufacture ploughs and tell them at cost price, or train local artisans in technical schools to manufacture efficient and at the same time cheap ploughs. He alludes also to the act that the *ryot does not as yet appreciate the value of time*, which is a great factor in estimating the value off improved ploughs; it is cheapness that attract them.

Practically the same difficulties have cropped up in all places; the cultivator fears, or pretends to fear, that the improved ploughs are too heavy for his cattle; the prices asked, though perhaps low enough in themselves for the articles offered, appear high to a villager who ordinarily spends but little cash on the purchase of a plough; the novelty of the implement renders the local smiths doubtful of their power to repair the ploughs; these men also discourage their introduction from fear of losing their customary payments for repairs; and finally, too often, much is both expected or exacted from the ploughs, and disappointment follows.

The Director of Public Instruction in Ceylon is doing much good work in endeavours to popularise improved light ploughs amongst the natives, and now that the cultivation of cotton and tobacco is being taken in hand by European planters, more attention may be given to the ploughs manufactured by Messrs. Howards.

As regards the native's objection to English ploughs, and his ignoring the great gain in the saving of time by their use, it would be well to point out to him in what way the value of time saved becomes an important factor in the calculation as against cost. The cultivator knows well enough how often scarcity of ploughing cattle from murrain or sickness amongst the village herds, hinders work in the field, losing half the time required for ploughing, and so causing the sowing to be too late, to the loss of many a field of unsown faddy; whereas had the work been put through quickly, the whole extent of tillage might have been accomplished within the time of the rainfall. It too often happens that cattle cannot be hired for any sum, so great is the demand at ploughing time. Then it is that an improved implement doing the work in half the usual time, would be of infinite value, and amply repay the cost. We feel confident that if this advantage of the improved English plough over the ordinary village implement were impressed on the cultivators' attention, it would be more generally adopted than is now the case. In South India many hundreds of light English pattern plough are being worked with advantage, yet at one time in no part of the East was the prejudice against them stronger than in the Indian Peninsula.—*Ceylon Advertiser.*

TOBACCO COMPANIES AND TOBACCO SOIL.

THE eagerness with which capitalists and planters are taking up the cultivation and preparation of tobacco in Ceylon and elsewhere, is almost equal to that with which others are investing in auriferous

land in South Africa. Perhaps a few words of caution on this subject may not be out of place in the columns of a periodical devoted to the interests of Ceylon industries.

As regards climate, there is such a variety in the island, from the very humid to the extremely parched, to be found in western and south-western localities on the one hand to the northern and eastern on the other, that there should be little difficulty in meeting with what is required. As for soil, however, the matter is not so easily settled, for there can be no doubt that none but fairly rich land is likely to produce good tobacco for a series of years. In Ceylon there is very little coming under this denomination in the majority of districts, and there is the probability that even where the land is well suited to the cultivation of the plant, that it must, after a short time, be assisted by artificial means. Those means are, according to experts, a supply of lime, phosphates and animal and vegetable manures.

The present range of prices for fine "wrapper leaf," from 1s. 6d. to 2s. 10d., will doubtless enable a good deal to be done in the way of manures, but we would advise intending planters not to reckon on a continuance of such figures. The planting of new land with tobacco in Sumatra, Borneo, Ceylon and Jamaica must, as in the case of tea, lead to the over supply of fine tobacco, one leaf of which suffices for wrappers for several cigars.

It is more than probable that the conviction of this in the minds of some of the largest proprietors of tobacco estates in Sumatra is the true explanation of so many of them disposing of their properties to Limited Companies. We have heard of another reason for this change of proprietorship in the decreasing fertility of the soil, caused by the exhausting nature of the cultivation.

That in the future, near or remote, there will be any falling off in the demand for tobacco of ordinary quality we do not apprehend; the habit of smoking is too deeply implanted in the rising generation to allow of any such foreboding, beyond which there is the additional reason for a continued expansion of the trade in the growing fashion of cigarette smoking amongst ladies. At the same time we are bound to confess that of late years there has been a marked deterioration in the quality of cigars sold in this country, far more so than in the quality of cut tobacco used for cigarettes, so much so is this the case that unless a very high price is paid it is almost impossible to obtain a pleasantly smoking cigar.

The reason of this falling off in the flavour of ordinary cigars is that the employment of a fine quality of "wrapper leaf" for the outsides of cigars enables the manufacturers in this country to palm off the veriest rubbish of leaf in the inner portion, the inferior quality of which is only apparent when it is being smoked. The Ceylon Tobacco and Cigar Company will do well to avoid this palming off inside rubbish by means of a fine looking wrapper, and adhere to a good selection of well-cured leaf throughout.

The inferiority of cigars generally, and the very high price demanded for anything like quality in the article, have led to an enormous increase in the demand for cigarettes, for which a medium description of cut leaf is required, and this must sensibly restrict the use of wrapper leaf. It is worth while for Ceylon tobacco planters to take note of remarks made by the British Consul at Amsterdam on the trade in Sumatra tobacco at that port, which he describes as very unsatisfactory to importers. The quality of the crop was not so good as in previous years, the plant not having fully developed. There was, in consequence, a much larger quantity of dark-coloured and second-class tobaccos among the importations, and the light-coloured kinds, which command high prices, were comparatively scarce. There was a large crop, and the few lots of fine quality fetched high prices, but the rest had for the most part to be sold at rates which were exceedingly discouraging to importers. The more favourably-situated plantations still gave good results, the dividends for 1888 being excellent, but so serious a drop in the prices of tobacco affected many undertakings still struggling with difficulties, and some of them have already gone into liquidation. It has been stated that this falling-off in quality is due to a great extent to exhaustion of soil, just as in the Western States of America, wheat crops are decreasing.

In another place will be found an interesting account of the cultivation, curing, and manufacture of Mexican tobacco in the State of Vera Cruz, from which it will be seen how much pains are being taken in the development of the industry in that country. The remarks in question point to the fact that those planters who combine the manufacture of cigars with that of tobacco-growing and curing, realize very large profits.—*Ceylon Advertiser.*

THE COCOA BEETLE.—Agriculturists of this island, says the *Chronicle* of St. George's, Grenada, continue to be considerably exercised over the cocoa beetle, and well they may, for the pest is extending its ravages in all parts of the island at an alarming rate. Acres upon acres of trees, chiefly of young growth, have already fallen victims to the destructive insect, and many more are threatened. The Commission appointed by the Governor to inquire to what extent the beetle is destructive to the trees, and to determine upon measures for its destruction, has commenced its inquiry, but when that will terminate it is hard for us to say. One or two planters have set an excellent example to their brethren by employing boys and girls to go through the fields and destroy the larvæ and the beetles wherever they are detected.

KALUTARA, Sept. 27th.—A case of some magnitude, in which Mr. Simon de Fonseka as plaintiff claimed damages, R1,312·50, from the lessees of his cinnamon estate, Pitagoneliya, for breach of covenants of lease, was heard on the 25th instant, the claim being resisted for the lessees by the Hon. Mr. A. de A. Seneviratne, Advocate, assisted by Mr. Proctor Wijratne. The plaintiff was represented by Mr. Walter Pereira, Advocate, assisted by Mr. Proctor de Silva. After a lengthened investigation, during which the evidence of the headmen, who had assessed the alleged damages at plaintiff's request, was led for plaintiff's side, judgment was reserved, and was pronounced yesterday in favour of plaintiff for R1,200 and costs. The breaches complained of were that drains were not well opened out and kept clear, so that cinnamon bushes were detrimentally affected by water being allowed to remain stagnant; that tender shoots were cut; and that weeding was done in a very unhusbandmanlike manner. Mr. Jardyne, a cinnamon planter from the Negombo District, having inspected the land at the plaintiff's request, gave evidence for the plaintiff. The judgment is likely to be appealed against.

TRAVANCORE TEAS SOLD IN COLOMBO.—At yesterday's (Oct. 2nd) public sales of tea a small invoice of Travancore tea, brought down by B. I. steamer, was catalogued, and, though not sold in sale, afterwards realized high prices privately. The tea was catalogued by Messrs. Forbes & Walker, and the following particulars are gathered from their catalogued:—

PENSHURST.

14 hf-chs.	Bro. Pekoe	...	910 lb...76 c. bid
6 ,,	Pekoe	...	300 lb...53 ,,
17 ,,	Pek. Sou.	...	765 lb...41 ,,
6 ,,	Unassorted	...	300 lb...45 ,,
43 hf-chs.			2,275 lb.

The tea is described to us as very well made, and altogether an attractive parcel, as the prices bid in the room testify. Higher prices were paid privately after the sale, and the proprietor of the estate ought to be well satisfied with the result of his experiment in sending his teas to Colombo for sale, where they meet with ready competition from buyers shipping to all parts of the world. We hope that we shall not only see Penshurst teas continue to be sold on our market, but also that other Travancore proprietors will follow this excellent example and send their teas to Colombo for sale, where full value can always be obtained for them.

WYNAAD COMMERCIAL PRODUCTS.

At the meeting of the South Wynaad Estates Company on the 29th ultimo, at the Offices of the Company in London, Mr. A. R. Hinde spoke as follows:—

When first asked by Mr. Spain to assist in the resuscitation of this company, I did it with a view to planting tea, but my views were overridden by the advisers of the company in India, who preferred to go in extensively for planting ledgers, which, I think, was a mistake. At the same time, it is but just to them to say that at that time there was scarcely a man in the Wynaad who would have endorsed the views I held with regard to the cultivation of tea. But now you find that one of the principal shareholders in one of the Wynaad mines has been out to India and has come back strongly urging that his company should plant the whole of its estates in this way. On the Ouchterlony estate, almost adjacent to your property, they have gone to the extent of planting 1,200 acres with tea, and the manager of the two companies that have already written with regard to having joint works, Mr. Patterson, is so satisfied as to the result of tea cultivation that I believe, or at least I think, he has written home to his companies urging them to cultivate their spare lands with tea. Mr. Hamlin, who is now the manager of the Oriental Bank Estates in Ceylon, and who has had, therefore, exceptional advantages of knowing what tea will do, and who has had a still longer experience of the Wynaad, tells me he calculates there is nothing in Ceylon that can beat Wynaad as a tea-producing country, and that the one fear Ceylon has is that Wynaad will embark extensively in tea cultivation. I may safely say that there is only one estate in Ceylon that yields anything like the results obtained in the Wynaad. On the Ouchterlony Estate there was produced 600 lb. made tea per acre, and on an estate abandoned for coffee they are getting an average of 800 lb., and upon the Periashola Mr. Minchin has ¾ of an acre of this tea, and tells me that he got 800 lb. of made tea from even that quantity of land. It is upon the yield of tea that everything depends, and I calculate, and think I have allowed a liberal margin for everything, that you can put your tea on the market here and sell it at 6*d*. per lb. and if carefully prepared, it should realise fully 1*s*. per lb., which will give you on the 150 acres it is proposed to plant, an income of £1,000 a year.

THE PLANTING OF PEPPER.—I also advocated. It has been adopted on a good many estates, where it is planted in conjunction with coffee. There is a drawback, because you have to coppice your standards once a year, and that is injurious to the coffee, but I have seen vines growing upon Mr. Walker's estate at Perengodda, the yields of which was sometimes extraordinary. The question that arose was whether our pepper would be equal to Malabar pepper grown below the Ghauts. The first pepper brought a higher price than any on the market, and the natives are turning their attention to its cultivation in the Wynaad. If you grow the pepper amongst the tea, you have to coppice the tea, and therefore you do not injure the tea one atom. You would get the whole of the profits of the vine at no cost, because the cost of cultivation is borne by the tea, so that all you have to pay is the outlay in harvesting. I propose that the precaution be taken of planting through the cinchona these standards also, so that if by possible chance you did get canker then you would have the pepper vine standing, and by the time your ledger has given out you would have a pepper estate in its place, which would subsequently be planted with tea. I think I have given fair and reasonable grounds for saying that the prospects of the company are good, because you can calculate something like £60 an acre profit from your tea land when it has come to maturity. You will get tea (so well has it come on) within nine months from its being planted in the open.

On the cinchona I have placed apparently a high value, but the figures are based upon actual returns obtained, and figures as given to me by the leading planters in the Wynaad. I have calculated simply 4 lb. of dry bark to the fully matured tree, and that it will yield you only 4 per cent. of quinine, though I have had an analysis of 11 per cent., and I have taken the inside value of that at 2*d*. per lb., so that I do not think I have been guilty of over-valuation, especially as 7 per cent. would be about the actual produce. The market for cinchona is perhaps lower now than it has ever been, and I have the assurance of Mr. Hamlin (and there is nobody more qualified to speak than he) that the visible stocks of cinchona are simply kept up by the destruction of the plantations—a fact that the consumer does not know—and it is only the question of a year or two when of necessity you must have a rise in the value of your bark, which I have not discounted in the slightest degree. In the Wynaad the same process is going on. I should think there is a material reduction in the actual acreage under cultivation, and practically not a single acre has been put in to supply what has been destroyed, because the low prices do not induce plantation. Moreover, the actual area from which bark can be successfully grown is exceedingly small. In Ceylon it will not grow except in a few favoured districts, and when I tell you that 40 or 50 acres of ledger embrace the whole of it, you may fancy how limited is the area upon which it can be produced. The result will be that probably we shall have Cinchona at as many shillings per pound as it now is in pence. With regard to coffee I can support all that Mr. Gramshaw has said. When you took over the estate the coffee had been so neglected that they actually had to take axes and cut down the trees to the destruction of much that was valuable. I do not know any other place in the Wynaad that would have stood such treatement, because at the present time, with the exception of the Ouchterlony, that is the best; and that estate is notoriously good. What the chairman has told you as to the cost and trouble of bringing this estate round is perfectly correct. With regard to tea it had been so abandoned, and was actually burnt to the ground. The jungle has now been cleared away, and Mr. Punnett has written to say that as regards tea there has scarcely been the failure of a single tree. All the mining operations took place above what is now the cultivated ground and the *debris* was thrown upon it. I think it is a healthy tea and when we no longer require the plant for seed purposes it can be cut down and commence to yield probably 800 lb. of tea per acre. (Hear, hear.)—*Madras Mail*, Sept. 25th.

FROM THE MEDITERRANEAN TO LAKE TCHAD.

The *Nouvelle Revue* has an article on the Trans-Saharan railway scheme. The writer warmly espouses the views expressed the other day by Mr. Stanley. France must construct a railway, and construct it soon. The moment for action has arrived. The economic future of France is, more or less, entirely involved, and her political importance is no less concerned. Financially, scientifically, diplomatically, the way has been cleared. The great objection to the scheme lies in its name. The Soudan causes everyone to think of Tonquin, of Dahomey, of distant and fruitless expeditions. But there is no true parallel. The base of the project must be Algeria—the goal, Lake Tchad. The topographical conditions are shown to indicate this unmistakably. Lake Tchad is the "enviable port" of French African enterprise. "In order to enter it it is enough to reach the plateau of Ahir in the centre of the zone of influence which Her Britannic Majesty is good enough to recognize as ours. Masters of this point, we hold the African continent strategically from the Equator to the Mediterranean. We cover the Niger and Timbuctoo. Our Senegal will not have to wait long before we join hands with it." The tide of Eastern and Western Islamism, which at present

flows undisturbed across North Africa, will also, it is urged, be broken by the establishment of French influence in a Northern and Southern line, and the new force of the Senoussiya be thus prevented from communicating itself to the Mahommetans of Morocco. The commercial advantages of the railway are of course made the most of. But possible alternatives for the direction of the line seem numerous enough to be likely to keep the construction yet a long time from the range of practical enterprise.—*Review of Reviews.*

COFFEE MIXTURE LABELS.

The thirty-third Report of the Commissioners of H. M. Inland Revenue, for the year ended March 31st, 1890, has just been published, and contains statistical and other information of interest to the trade. As regards coffee mixture labels, we note that the following table gives the number of coffee labels issued up to March 31st, 1890, and the amount of revenue received:—

	½d Labels	1d labels	Net amount received		
	No.	No.	£	s.	d
England... ...	548,917	269,084	2,264	15	2
Scotland... ...	12,782	6,286	52	16	5
Ireland	45,864	4,820	115	12	8
	607,563	280,190	£2,443	4	3½
Year 1888-89	670,050	309,828	2,686	17	9
Decrease...	62,487	29,638	£2[illegible]3	13	5½

The following table gives the receipts since 1882-83 in which year the duty was first imposed:—

Year	½ lb. Labels No.	1d labels No.	Net amount received £	s.	d
1882-83.........	1,440,305	802,434	6,314	2	2½
1883-84	1 432,203	645,429	5,673	0	10½
1884 85.......	1,110,664	539,893	4,563	8	9
1885-86.........	1,021,868	446,525	3,989	8	3
1886-87.........	799,914	370,971	3,212	4	0
1887-88.........	704,862	332,921	2,855	12	8
1888-89.........	670,050	309,828	2,686	17	9
1889-90.........	607,563	280,190	2,433	4	3½

The Inland Revenue Commissioners add to these tables the following significant note:—"The continued reduction in the revenue arising from these tables still, in our opinion, results from the unpopularity of coffee mixtures and substitutes for coffee."—*Grocer*, Sept. 6th.

THE FOOCHOW TEA TRADE: GREAT COLLAPSE.

If one half of the stories reaching us about the trouble and distress amongst the Teamen are true, they reveal a very sad state of affairs. Men, hitherto well to do, are ruined. Homes have been broken up by the score. Wives and children have been sold, and many suicides committed. One of the most painful cases brought to our notice is that of a whole family of eight, reduced to a state of utter destitution, taking their own lives by eating opium. But indeed all the stories are more or less heart-rending. These men have our sympathy. They have never come into contact with foreigners and therefore had no opportunity of hearing what was going on in the outside world. They knew nothing of the great depreciation of values in the foreign markets, any more than they did of the great American Silver bill which was to affect their interests so disastrously. All they had to guide them was the course of prices in this market last season. They could not foresee that they would have to take 30 to 40 per cent under those prices on the average, as they have had to do. If we are rightly informed, there are few, if any, of these men who can escape ruin. Capital has been sunk, and what remains is now in few hands; and credit will be very charily given after late experiences. There will be changes and probably very important changes in the working of this part of the industry. It goes without saying that the ruin of the teamen has not come about without very considerable loss to the hongmen. Several of the Hongs indeed will have to close their doors. The consequence will be, that we shall have the small supply of this season still smaller next; and if the annual falling off is to continue on its present scale, the future of Foochow is gloomy in the extreme. But we will not despair. We have before given it as our opinion that, with these high exchanges, we can lay down tea cheaper in London than the India and Ceylon producers, and if we can only fight those countries with their own weapons, and pander to the popular taste by sending them machine made teas, we should have better times to look forward to. The foregoing consideration of getting the natives to make tea by machinery suggested itself after hearing of a telegram from London advising that 'Foochow Congous were not wanted.' It is evident that something in the shape of novelty is necessary to catch the popular taste, and this form of novelty or reform would appear more easy of attainment than the previous suggestion of the government employing Indian planters to instruct the natives in their special mode of cultivation and manufacture which has proved so successful. The proposal is to make a trial. It would not apply to our Specialities, namely Sonchongs and Flowery Pekoes; and probably some other district teas should continue to be made as they are at present.—*Foochow Echo*, Sept. 18th.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Sept. 11th.

CINCHONA.—At Tuesday's auctions a moderate quantity of bark was offered, the total being as follows:—

	Packages		Packages	
Ceylon cinchona	1,160	of which	877	were sold
East Indian cinchona	282	do	199	do
Java cinchona	55	do	55	do
S. American cinchona	1,202	do	81	do
Total	2,699	do	1,212	do

Among the bark offered were a good many second-hand parcels of Eastern growths, and nearly 700 bales Cuprea, which were once more placed on sale in the hope that the improved value for the article would enable holders to obtain their limits. Such was not invariably the case, however, and several parcels were bought in at more or less nominal rates, though a small concession on the part of the holders would in several instances have led to business. The Cuprea bark appears to be held at prices considerably in excess of the present market value, and none of it was sold. A very satisfactory amount of competition was manifested during the auctions, although only one firm bought very largely; and the general opinion is that prices, though slightly irregular, were on the whole fully up to the previous auction rates, the average unit being placed at 1⅞d to 2d per lb.

The following are the approximate quantities purchased by the principal buyers:—

	Lb.
Agents for the Mannheim and Amsterdam works	100,346
Agents for the Auerbach factory ...	35,047
Agents for the Brunswick factory	33,209
Messrs. Howards & Sons ...	30,757
Agents for the Frankfort o/M and Stuttgart works	25,943
Agents for the Pelletier factory ...	21,483
Agents for the American and Italian works	16,961
Mr. Thomas Whiffen ...	5,650
Sundry druggists	19,105
Total quantity of bark sold ...	288,506
Bought in or withdrawn	19 ,723
Total weight of bark offered ...	480,229

SOUTH AMERICAN CINCHONA.—Of cultivated Bolivian Calisaya 499 packages were offered, of which 81 (13,230 lb.) were disposed of at 7½d to 9½d for bold quilly chips and somewhat irregular grey quill. A large quantity of old Cuprea bark (699 packages) was bought in, the price asked 3½d per lb., being unobtainable. Four cases low Red bark, dull colourless quill, were also bought in only 3d per lb. being offered for it.

ESSENTIAL OILS.—In Citronella there has been a very good business, and the demand keeps up well, the spot price is ⅝d to ⅞d per oz.; and business has been done at 12½d per lb. c. i. f. The price cabled from Ceylon is higher, viz. 13¾d per lb. c. i. f.; while for Lemongrass 1d 9-16ths c. i. f. is required.

COCONUT OIL has advanced in price since last week, and closes very firm indeed. Fine Ceylon oil on the spot is held for 32s 9d, while for shipment near at hand 31s c. i. f., and for distant delivery 30s 6d c. i. f. is required.

QUININE.—Market stagnant. The only business reported this week is a sale of 5,000 oz. second-hand German bulk, at 1s 1⅜d oz. There was some faint expectation that the American Senate might decide to re-establish the duty on quinine during the debate on the M'Kinley Tariff Bill. In that case our market would probably have been temporarily influenced, but, as it is, the amendment to subject quinine to a customs duty was defeated.

HILLCOUNTRY PLANTING REPORT.

THE VALUE OF JARRAH TIMBER—THE "KEW BULLETIN"—THE ECONOMIC PLANTS OF MADAGASCAR.

After I had written at such length on Australian fuel trees,* I opened the latest number of the *Kew Bulletin* and found a notice of the celebrated Jarrah tree of Western Australia (*E. marginata*), in which Baron Von Mueller is quoted to the effect that this is one of the least inflammable trees for building structures and at the same time the very best of the West Australian trees for charcoal. We have some splendid specimens here of this famous eucalypt, the wood of which compares not unfavourably with mahogany, but neither we nor any others who have grown Jarrah trees are likely to convert them into charcoal. The immediate reason for the tree being noticed in the *Kew Bulletin* was that blocks of the timber were being used for paving streets in London. A similar use of the timber in Melbourne is mentioned, but when I was there in 1880-81 I saw blocks of red gum (*E. rostrata*) being laid in Collins Street; and while Victoria is rich in this excellent timber and Jarrah is found only in Western Australia, it is not at all likely that the imported and more expensive wood (probably not better for the purpose) would be resorted to. In the London *Times* I find a condensed form of the information in the *Kew Bulletin* ready to my hand, which I quote:—

JARRAH WOOD.—The new *Kew Bulletin* contains an interesting section on the properties and uses of the jarrah wood, a species of eucalyptus, native to Western Australia. The main difficulties in connexion with its use in this country are the cost of freight for such heavy timber from Australia and its intense hardness, which makes it difficult for ordinary English carpenters' tools to work it. The tree which produces it grows generally to a height of 100 ft., and sometimes 150 ft. It is found only in Western Australia, extending over the greater portion of the country from the Moore River to King George's Sound, forming mainly the forests of these tracts. According to Baron Mueller, when selected from hilly localities, cut while the sap is least active, and subsequently carefully dried, it proves impervious to the borings of insects. Vessels constructed solely of it have, after 25 years' constant service, remained perfectly sound, although not coppered. It has been tried at three places in the Suez Canal, and, after having been down seven years, the trial samples were taken up in order that a report on their condition might be sent to Paris. From certain correspondence between Kew and some London vestries, it appears that jarrah has lately been used by the Chelsea Vestry for paving the King's-road, and by the Lambeth Vestry in the Westminster Bridge-road.

There are few trees about which such contradictory accounts have been given, especially as to its ability to resist submersion in sea water and the attacks of *Teredo navalis*. Conspicuous in the Western Australian Court in the Melbourne Exhibition of 1880 was a fine slab of Jarrah said to have been for 40 years part of a pier at Fremantle and which certainly was uninjured. The result of other trials, however, was stated to be its liability to be bored equally with other trees; but the evidence in favour of the timber largely preponderates. The non-inflammability of the timber renders it specially valuable for shingles. It can be used for the purposes to which *sâl* (*Shorea robusta*) and teak are put, and also where those woods are inadmissible, while it is said to be cheaper. Mr. Allen Ransome reported: "It is beautifully marked, and somewhat resembles mahogany in colour. Railway sleepers, joinery, casks, spokes and hammer handles were made from it. The planed and moulded specimens left the machines with a very fine surface." Like teak its breaking strength is not to be compared to that of the Australian iron and stringy barks. The figure 1,982 for average specific strength, however, is not bad. It attains a great size, exceptional planks having a diameter of 10 or 11 feet. This, like other eucalypts, is liable to the existence on its stem and branches of enormous protuberances, most beautiful slabs of which were exhibited at Melbourne in 1880. Those from the Jarrah are described as rivalling in beauty the finest specimens of walnut or pollard oak. The protuberances occur 6 to 10 feet in diameter.

There is other matter of interest in the September number of the *Kew Bulletin*. Mr. W. F. H. Blandford identified an insect which injured barrel staves as a small beetle called *Trypodendron signatum*, Fabr., "Prickly pear" has spread so in South Africa that legislative measures have become necessary for dealing with. This reminds us that a member of the Madras Civil Service once reported that he found this plant useful as a protection for tree seeds which he sowed in spaces cleared amongst it. We have also seen it stated that if the thorns are burnt off the sliced leaves make good fodder for cattle.—There is an article on the treatment of mildew in vines. The remedy is "Bonillie Bordelaise," a mixture of sulphate of copper, slaked lime and water, a mixture likely to be useful not only as a fungicide but as an insecticide.—There is an interesting account of cultural industries in West Africa But of chief interest in Ceylon, which is supposed to have been once joined to Madagascar, is an elaborate paper on the economic plants of the great African island, by the Rev. Richard Baron, F.L.S., In the prefatory matter it is stated that,

In a valuable paper by the Rev. Richard Baron, F.L.S., on the Flora of Madagascar (*Journ. Linn. Soc.* vol. xxv., pp. 246-294), it is stated that the vegetable productions of Madagascar have been very extensively "explored, and that the majority of the plants inhabiting the island are known to science." The flora of the low lands of the southern part of the island is still, however, the least known. Our knowledge of the flora of Madagascar is due to the labours of numerous botanists from Flacourt, Dupetit Thouars, and Commerson to Grevé, Bojer, Grandidier, and Ellis. Within the last few years this knowledge has been greatly increased through the very successful labours of Mr. Baron himself, and his collections, received at Kew, have been determined and described by Mr. J. G. Baker, F.R.S., It is estimated that whereas until recently less than 2,000 species of plants were known from Madagascar, there are now named and desbribed about 4,100 species,

* See page 353.—ED. *T. A.*

Mr. Baron has been good enough to supplement his paper on the Flora of Madagascar by preparing for the *Kew Bulletin* some brief but interesting notes on the economic plants of the island. These plants are of considerable interest and importance. One of the earliest notices of Madagascar economic plants is contained in Rochon's *Voyage to Madagascar and the East Indies* (English translation, 1793, pp. 280-297). In this work plants from the north of Madagascar, "now transplanted in the Royal Botanical Garden at the Isle de France" (Mauritius), are given under their native names The Ravensara (*Ravansara aromatica*), the Tanguem or Tangena (*Tanghinia venenifera*) and the Filao (a species of *Casuarina*) and many others are noticed. The later tree is quaintly and not unappropriately described as "Equisetum arborescens"

Dr. G. W. Parker, a medical missionary sent out to Madagascar, has recently prepared a Malagasy Materia Medica, with special reference to the use of native plants. This, with determinations made at Kew, was communicated to the *Pharmaceutical Journal*, 1881 vol. xi., pp., 853—855. There are numerous scattered notes respecting the economic plants of Madagascar to be found in other works, but the above appear to include the more systematic attempts to describe them. It may not be inappropriate to mention here that there are still some very valuable plants of Madagascar about which at present we know very little. As shown in the *Kew Bulletin* for May 1888, p. 135, we are not acquainted with the source of Madagascar Ebony nor of Madagascar Sandal wood. There is also the plant which yields Madagascar Piassava. This is doubtless a palm, but not a species of Raphia as is generally supposed.

While much of the flora of Madagascar is identical with that of Ceylon, the great island has far the advantage, and to it we owe, amongst other productions, "the flambeau tree" (*Poinciana regia*) and "the traveller's tree." Mr. Baron recognizes three separate zones, regarding which he states:—

"That the flora of the central region should differ widely from the flora of the eastern and western regions is accounted for by the great elevation above the sea of the central part of the island. But how are we to explain the existence of so great a difference between the floras of the eastern and western regions, occupying, as they do, the same latitudinal and altitudinal positions, for of the 2,206 plants found in the eastern and western regions only 128 (not reckoning the 100 occurring in all the three regions) are common to both. I believe the explanation to be simple. The central elevated plateau of the island, which runs from north to south, is undoubtedly of very great antiquity, having existed not improbably from Palæozoic times, and has therefore always formed a barrier between the floras of the eastern and western regions. The floras therefore, even if they were formerly similar, which is doubtful, have had abundance of time to become differentiated in character; and if they were originally different, they have been kept, by the existence of the mountain barrier, distinct to the present day."

TEA CULTURE TO BE ABANDONED IN CHINA?

The following is from the *Foochow Echo*:—

On account of the distressed condition of numerous tea garden owners in the tea districts, the authorities are advising them to do away with the tea plant and replace it with either rice or potatoes, as these two articles of necessity will not in any way so fatally injure them. We learn that many owners of land at the foot of the mountain, where water is to be had, have readily taken the advice. Opium, we are told, will also be extensively planted. Something must be done no doubt, as tea will never again be able to offer thousands of men the liberal support they derived from the trade years ago.

THE NEW CUSTOMS ORDER.

The announcement by the Board of Customs that tea is to be weighed and tared to the half pound is strongly resented by the tea trade. The *Grocer* says:—The intended change will entail a serious loss upon grocers, who can ill afford it in the present time of extreme competition, and particularly of opposition from civil servants themselves, and we cannot too strongly impress upon our readers the necessity of taking immediate steps of petitioning the Board of Customs and the Treasury against the proposed change. One thing is certain if the trade are to be harassed by the paltry charge of two-pence upon half-pounds of tea, the sooner the duty is abolished the better, and the Customs Department merged with the Inland Revenue, as this will save expenses and loss all round. The large wholesale dealers are stirring in the matter, but the weight of evidence to be brought before the authorities rests with the grocers, who distribute the tea, and they must individually and collectively take an immediate interest in the matter to prevent the change taking effect. Such an alteration should not have been contemplated when Parliament was not sitting, and no opportunity can be taken of bringing the subject before the members of the House of Commons, who passed the Act which imposes the duty of 4d per lb., and does not mention or contemplate the payment upon any fraction thereof.

The Produce Markets' Review says:—With reference to the second portion of the boards' order, the system of selling India teas on average weight has been tried and has been found to be altogether unsatisfactory. It is evidently quite useless for Her Majesty's Commissioner to waste the public time, or order systems to be kept up or altered, which the trado has absolutely refused to buy upon. What is the use of weighing tea by net weights to nominally oblige the importers, when no one will buy it after it is weighed? Here, again, the board acts without consulting those, who are interested, and who understand the subject.—*H. and C. Mail.*

FISH-CURING IN THE MADRAS PRESIDENCY.

The fish-curing operations during the official year 1889-90 show the usual upward tendency of the industry from the period it was taken under Government management. The following figures for the past five official years show the increase from year to year of the fish brought to the fish-curing yards to be salted:—

			Tons.
1885-86	...	...	27,396
1886-87	...	...	30,373
1887-88	...	...	37,495
1888-89	...	...	41,611
1889-90	...	...	43,496

At the beginning of the year there were 149 yards under operation, a new one was sanctioned but not opened during the year, and seven yards which did not turn out enough work were closed, leaving 142 yards open at the close of the year. 11,84,058 maunds or 43,496 tons of fish were taken to the yards to be cured, against 11,32,756 maunds or 41,611 tons in the previous year, showing an increase of 51,302 maunds or 1,885 tons, being 4·5 per cent., which is highly satisfactory. The quantity of salt used in the operations was 1,75,111 maunds, valued at R1,16,278, being at the rate of 12·16 lb. of salt per maund of fish. The quantity used in the previous year being 12·55 lb. per maund of fish. There have been great variations in the quantity of salt used in the various yards, and as no satisfactory explanation can be obtained, an intelligent Sub-Inspector has been ordered to be placed for a time in charge of each yard, to watch the operations carefully. The results of this step will probably elucidate the reason of the variation in the various yards. The total expenditure by Government under all heads in connection with fish-curing operations during the year, was R1,08,149-4-9, while the receipts amounted to R1,16,278-4-2, exhibiting a gain to Government of R8,128-15-5. Since these opereations were taken

under the management of the Salt Department, the Sta e Exchequer has benefitted to the extent of R38,079-0-7, while the general public have been able to obtain a healthy ar icle of diet instead of the rotten and puri'i fish oured with salt earth, etc., hitherto sold in the bazaars. The great opposition shown by the curers to resort to the yards has gradually given way, and applications are now being constantly made to open new yar s. Most of the fish cured passes into general consumption, only about 2,750 tons having been registered as exported by sea.—*Madras Times.*

THE QUARTERLY SALES OF CINNAMON.

These sales were held on Monday last, when only 1,300 bales Ceylon were offered, which at the opening, met little demand, and previous rates were with difficulty obtained, but the competition afterwards improved, as it was seen that several shipping orders had to he executed, and, excepting tho portion "unworked," which was mostly retired, the whole of the above quantity was taken off, prices towards the finish showing and advance of ½d to 1d per lb. on the May rates, especially for the finer qualities, viz.:—Ordinary to fino first at 7d to 1s 2d, superior plantation at 1s 3d to 1s 7d; seconds from 6½d to 1s 1d, finest at 1s 2d to 1s 4d; third at 5½d to 1s; best at 1s 1d to 2d; fourths at 5¼d to 8d, with extra fine at 10d to 11d; and broken, in twenty packagos, at 5½d to 7d per lb.

The details of the marks and prices are as under:—

Marks	Superior and First Quality 410 bales	Second Quality 310 bales	Third Quality 260 bales	Fourth Quality 290 bls.
A | S —— Kaderanc G | P	1s 3d to 1s 7d	1s 1d to 1s 2d	1s to 1s 1d	8d to 10d
FS K do	1s 3d to 1s 6d	1s 2d	1s	11d
F | S —— do W | S	1s 5d	1s 4d	1s 2d	8d to 11d
Horahena Estate JDSR in diamod Kadirane Plantation	1s 2d to 1s 4d	1s to 1s 1d	8d to 10½d	7d to 8d
S D A R Kaderaue Plantation	1s 1d to 1s 4d	1s to 1s 1d	8d to 9d	6½d to 7d
T R Kaderane Piautatiou	1s 2d to 1s 4d	1s to 1s 1d	8d	6½d to 7½d
F B Franklands	1s to 1s 3d	1s to 1s 1d	11d	7d
A & Co. Ekellc	1s to 1s 2d	10½d to 1s	8d	6½d
D Kaderane	1s 2d	—	7d to 8d	—
A S D, DD Kaderaue Plantation	10½d to 1s	8½d to 10d	7d	6½d
C H DE S, D, in diamond, K	8½d	7½d	6½d	—
Ditto B V		—	6½d	5¼d
C H DE S Bagatelle	8½d	7½d	—	—
A in diamond, Ekelle	8½d	6½d	5½d	5½d to 3d
C H DE S	8d	1d to 7½d	6½d to 7d	—
L F M in diamond	8d	7½d	—	7d
A M K in oblony Ekelle	7½d	6½1 to 7d	5½d to 6d	5¼d to 5½d
M B & Co.	7d	6½d	6d	5½d
C P H & Co.	7d	6½d	6d	—
O S	—	7d	6½d	5½d
F & Co. U Ekelle	8d (bt in)	—	6¾d to 7d	6½d (bt. in
K P Kader no	—	—	—	7d to 8d

CINNAMON CHIPS aro in request, and 357 bales and bags Ceylou put forward were chiefly sold at full prices—common at 2½l, cuttings, quillings, and clippings at 6½d to 7d.

The next series of auctions are arrauged for Monday, November 24th.—London *Grocer.*

COMMERCIAL NOTES ON INDIAN DRUGS.

* * *

The word tamarind is derived from tho Arabic "Tam r-Hindi," or Indian date, tho fruit being introduced into Europe from that country by the Arabs. At preseut the most esteemod varioty of East Indian tamariud are tho red ouos from Guzerat, which are worth as much as 50 rs. per kandy, or about 10s per cwt. The pulp is prepared for the market by removing the seeds aud epicarp by hand, then mixing the pulpy portion with about 10 per cent of salt, and treading it iuto a mass with the naked feet. The best qualities are free from fibre and husk, the commonest contain both as well as seed. The seeds, after the outer shell is removed, are eaten by the natives boiled or fried.

Goa-powder was, until 1864, known as a remody only, to the native Christians of the Portuguese possession of Goa. In that year Mr. D. S. Kemp, of Bombay, first called attention to its medicinal value, but not until 1875 was the fact finally established that Goa-powder was identical with the ararcba of the Brazilians Now Goa-powder is known as a rin worm r medy all over Iudia, and one wholesale drug house in Bombay alone imports over a ton of it every year. It is sold under the names of ararobine, chrysarobine and Goa-powder.

* * *

The sappan-treo is cultivated in the Madras presidency; and it is stated that it is tho practice among tho Thean families, whenever a girl is born, to plant a certain number of sappan-trees which are given to her as a dowry upon her marriago. Sappan-wood is largely used as a dye. The natives do not seem to employ it medicinally but at the Bombay Medical Depot it is now used in the place of logwood. Three qualities aro known in tho market, Singapuri, Dhunsari, and Ceylon, the last-named being the most inferior.—*Indian Agriculturist.*

PLANTING IN PERAK; STRAITS SETTLEMENTS.

(By Mr. J. F. M. Cock.)

GENERAL REPORT ON PLANTING BY THE SUPERINTENDENT GOVERNMENT PLANTATIONS.—On viewing figures presented along with this report, the question naturally arises what benefit has been derived from the expenditure? That there was no adequate returu iu revenue has always been apparent, and the collapse of the coffee crop in 1888 was met by a reduction in expenditure. At one time it was proposed to manure the whole of The Hermitage, but wheu the actual cost aud dubious result were duly weighed the proposal was dropped. Similarly, we could have continued tea manufacture at Cicely, but the tea would all have had to bo drained aud manured, and the purchase of a new rolling machine was demanded by the report on the twist of the leaf.

Everyone interested knows that coffee has grown of the finest quality iu this State, and can seo it growing on Waterloo now. The tea made at Cicely was reoognised by the whole commercial world as a good us ful tea, but no one well advised would put money into tea in Perak. Till the results named above—viz., the production of a first class coffee and a well-priced tea had been attaiued—the expenditure incurred was justified by what had been already spent on the planta ions. Nothing has been spent this year except on necessary buildings, grass fields, roads and drains, on the curing and dispatch of the coffee crop, and dispatch of the tea crop of last year. Next month I shall pack up the balance of the tea to be ready to be shipped off wherever it shall be dotermiued to send it.

In tho end of June Mr. Li Chin Ho took over the tea on Cicely and Tho Hermitago on behalf of the lessees, Mr. Li Peh (his father) aud Mr. Ah Kai. He is working monthly labour at present. If the lessees hold out till others are encouraged to join them on the tribute system this experimont will be a success. At present money is all going out, nothing coming in.—*Perak Government Gazette.*

A CEYLON COFFEE PLANTER tries to eclipse the gaiety of nations by alleging that the failure in the Ceylon coffee crop is due to permanent causes, which operate in South America as well, and that coffee will soon bo an unknown beverage. Are the stars in their coursos fighting against the great cause of temperance? *Brooklyn Times*, Sept. 12th. [Refers to interview with Mr. Grinlinton published in the New York *Tribune.*—*Cor.*]

GIRDLING FRUIT-BEARING TREES.

According to the American journal *Science*, some highly interesting results have been obtained at the Agricultural College in Massachusetts from the girdling of fruit trees. A row of crab-apple trees was selected. Three were girdled by cutting out a ring of bark one-eigth, a quarter, and a half-inch wide at the ground; three more were girdled to the same widths just below the main branches, and others on one or more of the main branches. All the girdles made near the ground healed readily and completely; those on the main trunk healed less completely, but sufficiently to ensure a good growth of tree; those on the branches healed less completely still, and in two instances the new growth failed to meet and the branch died in the spring. All showed a marked increase in fruitfulness over those not gridled, and little difference was observed in the effect of the various widths. But no definite conclusion can be drawn yet as to the consequence of this treatment on the permanent health of the tree; observations for many years can alone determine this point. A series of experiments made at the same place ten years ago showed that by removing a ring of bark early in July from fruit trees the ripening was hastened one or two weeks, and that the increased size and early maturity were not obtained at the expense of the quality.—*Ceylon Advertiser.*

BOYCOTTED BANANAS.—Considerable amusement, not unmixed with alarm, has been created in Queensland by reported political pressure brought to bear upon the Victorian Government with a view to the virtual exclusion of bananas from the Melbuorne market. Southern fruit-growers complain that the apples and pears grown in their orchards cannot compete against the toothsome banana under present conditions. First rate bananas are sold from hand-carts in the streets of Melbourne at 3d and 4d a dozen, or relatively cheaper than Victorian fruits, and the tropical luxury has been established as a prime dessert favourite This state of things led to an agitation for the imposition of a prohibitive duty on bananas, and at a recent conference of Victorian fruit-growers it was decided to ask for a duty of 1s a bunch. Mr. Cowley promptly communicated with the Melbourne authorities, with the satisfactory result that it if now understood there is no intention of acceding to the demands of the jealous pomologists. The importance of the matter to Queensland may be guessed from the fact that our exports of green fruit—principally bananas—last year amounted to a money value of £36,778, of which sum the shipments from Cairns represented £16,666, while Brisbane was credited with £12,074. The incipient trade indicated by these figures would have been well nigh crushed if the Victorian fruit-growers had succeeded in their object, but the danger is now past. It was, to say the least of it, a curious conspiracy to prevent people eating that of which they had become fond, and forcing them to return to the more insipid products of a temperate climato. In some respects the project reminds us of the plan advocated recently in an American State for the purchase by the Government of all the whisky made in the country and the issue of legal tender certificates to the value of the purchase money. The whisky would improve with age, it was urged, and the Government would thus be the gainer. But the distilling industry failed to gain the desired protection, and so have the apple and pear men. Where people prefer beer or tea, or develop a taste for bananas, it is certainly better to leave them free to gratify their inclinations.—*Queenslander*, Aug. 23rd.

DOOARS, DAM DIM, Sept. 19th.—During the past week the weather has been about the finest we have had for tea, since the season commenced. Outturns are in consequence looking brighter, but it is now too late in the day for estimated yields to be expected. A heavy thunderstorm last night, with a perfect deluge of rain looks as if we were at the last "kick" of the rains. Very heavy thunderstorm on Thursday night twelve inches of rain fell in as many hours; green fly, mosquito red spider all flourishing; weather cool except two or three days.—*Indian Planters' Gazette.*

TEA NOTES—Debra Dun, Sept. 9th.—Rain is badly wanted. We have not had half an inch of rain since the 20th August. We shall only make about a half tea crop this year. The rice and other crops are suffering from want of rain. Mangaldai, Sept. 9th.—At last there is a fair flush, but it has come too late for many to make up their decrease. Road to steamer ghât quite impassable; this generally seems to be the case with roads directly under the P. W. D. Saleng, Sept. 7th.—Only ·84 rain in week, making to date 54 in. against 96 in. last year. So this promises to be the shortest on record as last year was highest. Leaf plentiful. Good outturn for month expected. Rumours that a short crop is expected. Something of the kind wanted to raise the prices. Burregong, Sept. 7th.—We have just enjoyed a week's weather that has given no cause for complaint, and leaf is making a decided effort to again struggle through mosquito blight and green fly. Although many of the concerns will never be able to make up the tremendous decreases, prospects are less hopeless than they were ten days ago.—*Indian Planters' Gazette,* Sept. 16th.

SCHOOL OF FORESTRY.—A deputation from the Associated Chambers of Commerce waited upon Mr. Chaplin (with whom was Sir James Caird) at the offices of the Board of Agriculture, in St. James's Square, for the purpose of urging upon him the desirability of establishing a National School of Forestry. Colonel Hill, addressing Mr. Chaplin, said those who were with him desired to point out that the growing of timber as an industry might be most usefully extended in this country, especially in view of the timber supply from abroad becoming more and more diminished. They recomended, therefore, that Her Majesty's Goverment should estabish a National School of Forestry which would be an encouragement not only to the planting of Crown lands with trees, but would also induce private landowners to utilise ground which was at present of little or no service in the same direction.—Mr. G. Harper next spoke, and said he had received letters approving of the objects of the deputation from Lord Basing, official verderer of the New Forest, Sir Edward Lechmere, and other gentlemen. He further pointed out that, with the exception of Spain, this was the only country of any position that did not have National Schools of Forestry. England was the greatest timber-buying nation in the world, and at present imported annually something like £13,000,000 worth of that commodity. There wss a vast acreage of land now lying waste in this country which might were the proper instruction forthcoming, he used for timber growing, and partically enable it to produce all the timber it required.—Mr. Chaplin said there could be no doubt of the growing interest and importance of the question under discussion. The purport of the remarks he had heard seemed to be that his department should establish a National School of Forestry. He desired, however, to point out that the Act under which that department was instituted provided only for its inspecting and reporting upon schools which provided education either upon agriculture or upon forestry. So far as he could see, his department had no power to institute a school, but he would consider the matter very carefully, with a view to seeing if he could recommend such a course to the Government. Before he did this, however, he should like to obtain some further information upon the climate and soil of the waste land which Mr. Harper had said it would be possible to turn into profitable forest land.—*Gardeners' Chronicle.*

THE VELLUM PAPER manufactured by the Insatsukyoku deserves to rank among tho curiosities of Japan. It is made from a tree oalled Mitsumata. The tree is easily cultivated and grows quickly. At three years of age, the pruning can be used for paper making. In appearance the vellum paper is rich and glossy, its colour cream-like and its texture fine. It is as pliable and thin as the best writing paper, but so enormous in its strength that four people can grasp the corners of a sheet and raise a man standing on it.—*Madagascar News.*

THE DOUBLE COCO-NUT.—There are several Nuts of this extraordinary Palm, Lodoicea Seychellarum, in an advanced stage of germination at Kew. One of them has already produced a leaf, and has a mass of healthy roots, whilst two others are bursting into leaf. There is now, therefore, a prospect of our seeing this Palm among the many species which are the most striking features in the great Palm house. The process of germination in the Lodoicea is exceptionally slow. In its native habitat the Nut is said to be about two years, after falling on to the ground, before it produces its first leaf. The leaf on the Kew seedling is 2½ ft. long by 2 ft. broad, and it is folded double laterally, so that if spread out it would measure 4 feet. It is divided along the top into about forty segments the texture is unusually stiff and leathery even for a Palm.—*Gardeners' Chronicle*, Sept. 13th.

INDIA THE HOME OF THE SUGARCANE.—In the great German work of Dr. Lippmann, according to the *Sugar Cane*,—

He quotes Decandolle and Miquel to the effect that it is undoubtedly a fact that the whole of the wild kinds of the genus *Saccharum*, perhaps with one single exception, belong to India. The whole of the varieties of the true sugar cane (Saccharum officinarum) even those which by many botanists are regarded as independent varietios, as, for instance, the Chinese sugar cane (Saccharum sinense) point to the same origin. Botanical reasons also require us to look for the home of the sugar cane in India, and the occurrence of almost every wild variety of saccharum in Bengal, the oldest name of which—Gaura or Gauda—is derived from guda —is derived from guda or raw sugar (modern, *goor ?*) and whose inhabitants call themselves "the men of the red sugar cane," points in the same direction.

The original stock of the sugar cane is, we are told, no longer known, nor is it believed to exist in a wild state. This deduction is based on the united testimony of all who have written on the subject. Dr. von Lippmann alludes to the idea formerly prevalent that tho sugar cane was *apogamous*, and to the experiments and discoveries of Soltwedel and Harrison, but does not consider that any of these shake the theory of an Indian origin.

The mention of sugar in the earlier Indian writings, the Institutes of Manu, and the great epics of the *Mahâbhârata* and the *Râmâyana* is alluded to, and the probable age of these discussed, and the name applied to the sugar cane and its juice are given. As regards the time when solid sugar was first manufactured only two data can be given, viz., the reception of sugar cane as tribute in China in the 4th century, and a remark of Hiuen-Thsang, who travelled in India in the first half of the 7th century, distinctly mentioning both syrup and solid sugar, as also the fact that solid sugar was obtained in Northern India from tho sugar cane. From these Dr. von Lippmann deduces tho opinion that the discovery of solid sugar must have taken place between the 4th and 7th centuries, nearer tho latter than the former.

In connection with the above we would refer to the interesting discussion of the subject by Col. Yule in his *Hobson-Jobson* s. v. "Sugar." The Sakya tribe, to which Buddha belonged, claimed descent from the first king of Ayodhya named Iksvāku (in Pāli Okkāka, Sinhalese Okā), which means 'sugarcane.' The Sinhalese kings claimed the same honour.

SUGAR.—In respect to the sugar crop of Guiana, we learn this week that competent authorities estimate that this year's crop of sugar will fall 30,000 tons below that of last year. This falling off is ascribed to the same cause as at Trinidad, namely, the very heavy rains.—London *Grocer.*

CEYLON ENTERPRISE is thus noticed by "Peripatetic Planter" in the *Indian Planters' Gazette* :—

It is good for reflection to note how much Ceylon enterprise is ahead of Indian enterprise in the Tea matters. Almost every day one meets with instances. In the smallest suburban Grocers' shops, and in all-sorts shops of country villages, one can always find Ceylon tea in original, estate-packed fancy packages. It would be a rare thing to find an Indian *estate-packed* packet. Yet by this means tho Ceylon men are sure their Teas are not being spoiled by an admixture of China Tea, and that full justice is being done them, and that their reputation is in their own hands, and not in that of all the intermediary between the Indian planters and the consumer. The way in which Ceylon estate-packed packets have become procurable in the smallest villages within the last year or two is really remarkable, and is greatly to the credit of those who have achieved this big task. The way, too, in which the very much awake Ceylon Association protects the Ceylon planters by prosecuting people making fraudulent attempts to pass off blends as *pure* Ceylon tea, and others using misleading names on packets, is an example to tho I. T. D. A.

Then the famous "Lipton," who from selling hams, sausages, &c., by the million, has of late become also one of the largest retail vendors of tea in the U. K. has been "got at" by Ceylon enterprise, and he is off out to buy estates in Ceylon. His agency alone will be a stupendous advertisement for Ceylon teas.

SCIENCE AND PRACTICE.—From the proceedings of the American Association of Nurserymen, as reported in "Garden and Forest" we quote an opinion on pruning and pollarding, which seems interesting in its bearing on tea culture and horticulture generally :—

Mr. Thomas Meehan said that it had been fifty years since he wrote his first article for a horticultural paper, and it seemed to him, although horticulture had made rapid advances in all of those years, that it had not progressed as far on the scientific side as it ought to have done. As a practical example of some scientific truths, upon which good practice is based he instanced the fact that fibrous roots live only a year. They do their work and then die. Where there are a hundred small roots now about a young tree there will be in a few years only a few large ones radiating from it, like rail-roads on a map. These big roots alone have the strength to send out fibres, and tho root is of no value to tho tree until new white fibres are growing. Therefore, it may be that a mass of fibrous roots in a tree for transplanting is injurious. They are weak, they have no vital power to put out rootlets, and they may keep the soil from contact with the big roots, which, therefore, do not find the proper medium in which to throw out feeding roots. Another fact which observation teaches is that roots die in exact proportion to the amount of tops that are cut off. If a tree is pollarded nine-tenths of the roots may die and then invite a fungus which spreads to the living roots. It is said that the branches which sprout from these pollards grow strongly because the roots are stronger below them, but it fact they grow from the food stored up in the trunk, just as shoots three or four feet long often grow out of logs which lie by tho wayside. Generally pollarded trees die after this operation has been frequently performed. Look, for example, at an Osage Orange hedge. If one of the trees at the end is allowed to grow it will make a trunk as big as a man's body in twenty years, while the hedge plants of the same age, their vital power being weakened by constant cutting, are no larger than a man's wrist. Of course all pruning is not to be condemned, although it does weaken the vital power of the plant. We prune for other purposes than to make long lived trees.

TRINIDAD HAS ITS "AGRICULTURAL BOARD"—not giving special attention to any one industry or branch of agriculture, but to all. At a meeting of the Colonial Institute Mr. Morris, the Assistant Director at Kew, spoke of the Agricultural Board in the following flattering terms:—"At Trinidad Mr. Fowler has very ably assisted Sir William Robinson in developing industries in that island, and more especially in regard to the work of the Central Board of Agriculture. This Board and its local branches will undoubtedly do much good, not only by directly encouraging industries, but by bringing persons engaged in them into contact with the best markets for the produce in this country and in the United States.

THE NETHERLANDS-INDIA Agricultural Company held its annual meeting on the 8th inst., when the report for 1889 90 was presented, which shows that a good profit has been made. The disease in the leaves of the coffee trees was only observed to a small extent. The crop of the four undertakings amounted to 6,290 piculs of coffee, being about 300 piculs above the estimate, which figure would have been more if a fearful inundation had not destroyed a large quantity on the Sonoschar Estate. The quality of the coffee was very superior, and the prices fetched were high—viz., from c. 55¼. to c. 57¼. According to the profit and loss account there is a net profit of f. 84,704, and a dividend will be paid to shareholders of 15 per cent. or f. 45 per share—*L. and C. Express.*

TENDER FOR THE MYSORE RUBY MINES.—The Dewan of Mysore has, says a Bangalore paper, informed Messrs. Streeter & Co, the great gem merchants of New Bond Street, London, that the Mysore Government cannot entertain any proposal having for its object a monopoly of any particular industry, nor can it grant an exclusive right to prospect for gems for five years in so large an area as a whole taluq. A tender for a square mile or so will be entertained. The Mysore ruby mines are said to be even superior to those of Burma, and Dr. Clarke speaks of specimens shown him from the limestone rocks of Banawar as being "oriental of the purest water and not spinelles." —*Indian Engineer.*

RAILWAY SLEEPERS FOR THE HINDUPUR RAILWAY.—It is stated that the Mysore Government have decided to utilise the forests of Mysore for the supply of teak sleepers for the Hindupur Railway. About 80 miles of this line will be in Mysore territory and the requirements being about 2,000 sleepers per mile, 1,60,000 sleepers will be required. The sleepers are 6 ft. long 8 inches wide and 4 inches deep, or one and a third cubic feet each, and will cost about R2-4-0. Mr. Lee, son of Mr. Standish Lee, Sanitary Engineer of Mysore, has, it is believed, obtained the contract for preparing the sleepers from the rough logs as delivered by the Mysore Forest Department.—*Indian Engineer.*

ARTIFICIAL TEA.—The Germans are endeavouring to establish a new industry in the production of an article which they call artificial tea. They take the leaves of the wild strawberry plant and add to them the young leaves of bramble and woodruff, and the beverage brewed from the mixture is said to be of nearly the same taste as the tea of India and China. There is nothing artificial about this German tea, but it is a mistake to suppose that it can be produced inexpensively. It will cost quite as much as the imported tea, especially if it should be required in such quantity as would render it necessary to cultivate the herbs required in its fabrication. The cultivation and preparation of tea are not more expensive than the gathering and drying of substituted leaves would be.—"Science Gossip" in Melbourne *Leader.*

THE KOLA NUT, of which a good deal has been said lately, is rapidly increasing in favour as an indispensable adjunct to a traveller's kit. The French Alpine Club has just adopted it as a stimulant and nutrient in their mountain-climbing expeditions. The nut has, it is stated, been found to act most usefully in strengthening a person's "breathing powers" and keeping off muscular fatigue. The German military authorities have, it is said, determined to employ it in the German army. The acting principle of the nut is caffeine. —*Indian Agriculturist.*

THE "AWETO": A VEGETABLE CATERPILLAR.—The *Graphic* of 30th Aug. has the following:—The oddest insect in existence—so odd, that unless it were vouched for and explained scientifically would be considered a hoax—is the Aweto. It is not easy to decide whether it ought to be classed under the fauna or flora of New Zealand, for it is as much vegetable as animal: and, in final stage, it is a vegetable, and nothing else. This is the Vegetable Caterpillar, called by naturalists *Hipialis virescens.* It is a perfect caterpillar; and a fine one also, growing to three and a half inches. Until it is full grown it conducts itself very much like any other insect, except that it is never found anywhere but in the neighbourhood of the Rata tree, a large scarlet-flowered myrtle, and that it habitually buries itself a few inches under ground. Then, when the Aweto is fully grown, it undergoes a wonderful change. For some inexplicable reason, the spore of a vegetable fungus, the *Sphæria Robertsii,* fixes itself directly on its neck, takes root, and grows, like a diminutive bulrush, from six to ten inches high, without leaves, and with a dark-brown head. This stem penetrates the earth over the caterpillar, and stands up a few inches above the ground. The root grows simultaneously to the body of the caterpillar, which it exactly fills in every part, without altering its form in the slightest degree, but simply substituting a vegetable substance for an animal substance. As soon as this process is completed, both the caterpillar and fungus die, and become dry and hard, but without shrivelling at all. The thing is then a wooden caterpillar, so to say, with a wooden bulrush standing up from its neck. *Papier mâché,* perhaps, would better describe it than wood. It can be taken out of the ground entire, and preserved for any time. Where the Aweto is found, many specimens can be obtained. It is a light green when alive, and the Maoris eat it in its soft state, when it resembles marrow. When dry, they powder it for use as a flesh-dye in tatooing. It is certain that the caterpillar and fungus were made for each other, as the *Hipialis virescens* is never found without *Sphæria Robertsii* growing out of it, and *Sphæria Robertsii* is never found without this caterpillar attached to it.—Our engraving is from a sketch by Major-General Robley, and the specimen is in the possession of Comte L. de Jouffroy d'Abbans, French Consul at Zurich.

Major-General Robley has gained fame lately as a *badineur*; but in this case we do not think that he is "pulling the leg" of the public. A similar fungoid growth is not uncommon in the case of the white grub in Ceylon. In fact, as our entomological referee states:—

This fungoid disease is not confined to the larva of one species of moth alone. I have noticed it occasionally on mole crickets from several localities, and on other insects that reside underground, and which have succumbed to its attack. It must not be supposed from the statement that "the *Hipialis virescens* is never found without *Sphæria Robertsii* coming out of it," that every individual of the species is fated never to reach the perfect state from that cause, for how could reproduction be effected? I send herewith a book in which you will find a description and figure of the fungus.

The figure given in the book sent is of *Torrubia militaris* on the pupa in moth, and is very similar to the one drawn by Major-General Robley.

HILLCOUNTRY PLANTING REPORT.

"THE BATTLE OF THE WATTLES." THE BEST TREES TO GROW FOR FUEL.

I come up here to find the battle of the "wattles" * revived and raging, promising almost to rival "the battle of the gauges." When about three years ago I had the pleasure of visiting Mr. Kellow's fine and fertile estate of Albion, adjoining the reef of limestone so rich in spinel sapphires, below Hakgala, I remember we could scarcely get along the paths which had been cut on the patana from the abundance of the up-springing suckers from the roots of a wattle, which I suppose was *Acacia dealbata*? Now Mr. Kellow cultivates in preference a plant raised from seed he obtained from Australia as that of *A. decurrens*, which grows rapidly into a good-sized tree, but which does not send up suckers from its roots. I am sorry I have not Mr. Kellow's memorandum of a tree of this kind which Mr. Nock has at Hakgala, and which at the age of seven years has attained large dimensions,—50 feet in height and 7 in girth near the root, I believe. † *Acacia decurrens*, especially the variety known as *mollissima*, yields about the finest tanning bark in the world; and although it might not pay us in Ceylon to grow this tree for its bark, yet, in cutting trees down for timber or fuel, the bark might be stripped and saved. The local tanners of hides or those who have made tanning hides a great industry at Madras might give a remunerative price for the bark. I am glad to see the specimen Mr. Kellow has sent, because it enables me to class as identical with it one of two magnificent Australian acacias which we have grown without knowing their names, but merely distinguishing them as the "golden flush" and the "silver flush" wattles. As far as foliage goes the former is the same as Mr. Kellow's, and the other is probably *A. dealbata*, if, as seems to be the case, there is a variety of *A. dealbata* which grows into a large timber tree and does not send up suckers? Our two gigantic wattles have never shown the slightest tendency to this latter habit. Here as in Australia several of the numerous acacias which bear golden-coloured flowers have been indiscriminately called "golden wattles." In Nuwara Eliya this name has been applied to a species which sends up suckers and which has formed such a dense and shady grove near the Church. I am told that Dr. Trimen has identified this tree as a *decurrens*, var. *mollissima* ‡ The true golden wattle, *A. pycnantha*, however, is now grown in the forest nurseries in Nuwara Eliya, and has an undivided leaf, instead of the feathery foliage of the "golden wattle" we have been referring to. The true *A. dealbata* is, I suppose, the tree with silvery foliage, to be seen at and beyond Kellow's cottages, and which is specially remarkable for sending up groves of suckers from its roots. We have two "golden wattles" here at Abbotsford, neither of which is *A. pycnantha*. One species we are propagating from seed which the trees have yielded. The foliage and the blossom are equally beautiful, and some of the trees which were cut down yielded excellent firewood, *as I believe all the wattles do.* Of another species we have only one specimen, and it is remarkable from its horizontal and contorted habit of growth. Its leaf is exactly that of *A. pycnantha*, but the blossoms, instead of a series of little mimosa heads along a stalk, are regular catkins, closely resembling those of the willow. This wide-speading tree burst into full blossom recently, and "magnificent" is the only term which can describe the spectacle it presented. There are probably from 200 to 300 acacias in Australia, and a large proportion of them have golden hued and sweet scented blossoms. I can never forget the banks of the Mitchell river in Gippsland, both sides lined as it were with gold. The Australians when they go "a-maying" (in the month of January) carry home branches of golden-blossomed wattles, instead of the hawthorn of "home," which however flourishes exceedingly on the banks of the Derwent, in Tasmania. It may be well to give a notice of the species of acacias, native to Australia, of which we know most in Ceylon.

A. pycnantha, the typical "golden wattle," has been only recently introduced, and except as an ornamental plant it does not seem likely

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* The name is an old English one, and signifies the interlacing of boughs together to form a kind of wicker-work. The aboriginals used them in the construction of their abodes, and the early colonists used to split the stems of slender species into laths for "wattling" the walls of their rude habitations.—*Maiden's Native Plants of Australia.*

† Mr. Nock was good enough to measure his three giant trees in Hakgala Gardens in our presence the other day, with the following result:—

A. decurrens—8½ years old—50 feet high, 7 feet 2 inches in circumference a foot above the ground, and 5 feet 3 inches circum. 5 feet above ground.

Pinus longifolia—14 years old—6 feet 8 inches and 6 feet 4 inches in circumference respectively at 1 and 5 feet above ground.

Cupressus (? species)—40 feet high—9 feet and 7½ ft. in circumference at 1 and 5 feet above ground respectively—age not certain.—ED. *T. A.*

‡ On reference, Dr. Trimen is good enough to report as follows:—"So far as my memory goes the acacia in question (near Nuwara Eliya church) is the silver wattle, *A. dealbata*. I do not think that *A. decurrens* or its variety *mollis* (= *A. mollissima*) sends up suckers from the roots. The three sorts can be readily recognized by the young twigs of unopened foliage. In *A. dealbata* ("silver wattle") these are white and silvery; in *A. mollissima* ("black wattle" or "green wattle" in Australia, but often "golden wattle" in Ceylon) they are golden yellow; and in *A. decurrens* (also black or green wattle) they have but little silkiness and are merely pale green. *A. dealbata* rarely opens its flowers here and seems to be always in bud. *A. mollissima* has pale sulphur yellow blossoms succeeded by pods constricted between the seeds. Of true *A. decurrens* there does not seem to be much in Nuwara Eliya and its neighbourhood." There is no doubt, we believe, that Mr. A. J. Kellow has now on *Upper* Albion a fine grove of the true *A. decurrens* (the same tree as Mr. Nock's giant in the Hakgala Gardens) cultivated on patana land; and the growth made in three years is so great that already Mr. Kellow has been able to cut down trees for the posts and rafters of some lines he is building. His chief object in planting this acacia was a windbelt, for which the tree has proved itself admirably adapted. The grove runs straight up hill, and it has become so conspicuous as to be a landmark seen from the side of Namunakulakanda or the neighbourhood of Badulla, as Mr. Nock was able to tell us. We must mention one other fact: we received at Naseby some seed from Messrs. J. P. William & Bros. of Henaratgoda, and one packet marked *A. decurrens* was identical with seed received the same day from the manager of Abbotsford (given as a wattle that did not throw up suckers), and both packets were, we believe, recognized by Messrs. Nock and Kellow as of the right acacia (*decurrens*). Still, it may not be safe to trust to seed, and now that Dr. Trimen has given a ready means of recognising the three wattles so apt to be confounded, there ought to be less doubt as to their identity in the future. It is just possible that Mr. Kellow's trees, the Abbotsford and Henaratgoda seed may belong to *A. decurrens* var. *mollissima*, as it again throws up no shoots?—ED. *T. A.*

to be of much value to us. According to Baron Von Mueller, it is next to *A. decurrens* for tanning bark, but the tree does not seem to grow more than 30 feet high. In our climate, however, this and other Australian trees are likely to grow more luxuriantly than in their native habitat. The wood of this tree, though small, is well adapted for staves, handles of implements, articles of turnery, especially bobbins. [N. B —The Colombo Spinning and Weaving Company.] Maiden describes it as the golden, green or broad-leaved wattle, the bark rich in tannin and gum and the flowers in perfume. Osborne described the wood as tough and close grained.

A. decurrens Von Mueller describes as a small or middle-sized tree. Its wood is used for staves, turner's work, axe and pick handles and many other purposes. The Baron adds what is of special importance to our planting community, that it is an *excellent firewood.* He also states that it is a good first shelter for treeless localities [our patanas] for raising forest. [Officers of the Forest Department to note.] "The typical *A. decurrens*, with large leaflets [?], occurs particularly in New South Wales and is seldom above 30 feet high." But he adds a mention of trees 60 feet high, so that there must be distinct varieties, or, as is probable, the soil and climate of different localities give very different results, the tree is easily propagated and grows rapidly. It is content with the poorest soil, though it makes better growth in better soil. Cultivation easy, broadcast or in rows. Seeds can be obtained in Melbourne at about 5s per lb., each pound consisting of 30 0 0 0 to 50 000 grains. The seed ought to be soaked in warm water before being sown. Von Mueller adds "Hardier than *E. globulus*, although, unlike *A. dealbata*, it hardly extends to sub-alpine elevations." He means, of course, in Australia, where 2,000 feet, except in tropical Queensland and South Australia, may be the equivalent of 5,000 or 6,000 in Ceylon. Maiden gives the names, "black wattle," *from the colour of the bark*; "green" and "feathery" wattle.* The timber is light tough and strong but he adds that it is generally much bored by the larvæ of coleopterous insects. [We have not seen or heard of this occurring in Ceylon.] But the next quality attributed to this tree shows that it is just what is wanted to be cultivated in factory fuel groves. "EVEN IN A GREEN STATE IT FURNISHES EXCELLENT FUEL. *Yields over 26 per cent charcoal.* Wood easy to work. The sap wood is white, while the heart is of a pinkish colour. Slabs in the Technical Museum at Sydney were 12 to 18 inches diameter. But it is not timber we want so much on tea estates,—while the supply of tea boxes comes to us from Japan and other sources, as fuel, and especially fuel which will burn as this wood does when green.

And now of *A. decurrens*, var. *mollissima*, which we hope is really the golden-blossomed species near the church and in other places in Nuwara Eliya, Von Mueller states that all he wrote about *A. decurrens* applied to this variety; while Maiden says that the timber is light, tough and strong; used for staves for beef and water casks in Tasmania. It is subject to attacks by insects. [Not here, so far as we know.] A tree 2 feet diameter of this species was tested in Victoria and gave an average specific breaking strength of 2 063 lb. Not a word is said by Von Mueller or Maiden about *A. decurrens* sending up suckers; and Mr. Kellow's trees and ours do not; but we suspect that in both cases we have a departure from type? The golden-blossomed wattle in Nuwara Eliya certainly sends up suckers as readily as does the so-called silver wattle. *A dealbata*; and we do not think it advisable to grow *any* of the wattles amongst the tea, but only in ground devoted to them and to other trees. A large proportion of the Australian trees have a tendency to throw up suckers, and this tendency has been strongly developed with us by a favourite species of casuarina, which grows tall and straight and generally one-stemmed, the very reverse of the habit of our prevalent casuarina, which grows comparatively short, with dense foliage and numerous crooked branches. Many trees of this kind are inclined to die off at 7 to 10 years of age, but we have arrested this tendency by pruning; and even the trees which go off yield good firewood, *as do all the casuarinas, their ashes retaining heat for a prolonged period.* No more valuable trees can be cultivated by planters; but, as in the case of the acacias, not amongst the tea. The bushy *casuarina* seldom throws up suckers, but the enormous quantity of spines it drops is very adverse to other vegetation. The beautiful tall casuarina is objectionable amongst tea, though not equally harmful, by reason of its wonderfully profuse subsidiary plants in the shape of suckers. One tree near our bungalow has extended its roots full thirty yards around its stem, and all along they can be traced by fine young plants springing up from them, which, like those of *A. melanoxylon*, we are transplanting into pieces of ground where they can "increase and multiply" at their will. If as I think, our graceful, tall and slim casuarina, which shows no tendency to "insidious defunction," is *C torulosa* (syn. *C. tenuissima*), it is "*one of the best woods for oven fuel*," while of *C. stricta* the record is, "*As fuel it can hardly be excelled.*" Your readers are aware that on the sandy seashore near Madras large plantations were formed for fuel supply to the railways of *C. equisetifolia*, the large and beautiful tree so common in Colombo, and of which a remarkable avenue, planted by the late Mr. W. Ferguson, runs for a long distance from the new Lunatic Asylum. My apology for thus digressing to a notice of the casuarina (she-oaks and beef-wood trees of Australia) is that no better, at any rate few better, trees can be grown by planters and others for firewood than those trees and the "wattles." Of these I have now to notice the much despised and in Ootacamund execrated

A. dealbata, which, according to Von Mueller is a still better tree for the purpose we have mentioned than even *A. decurrens*. It is known to colonists as "silver wattle," "Prefers humid river banks, where it *sometimes* attains 150 feet, yielding tough timber, used by coopers and other artizans, but principally serving as

SELECT FUEL OF GREAT HEATING POWER.

This tree is distinguished from the black wattle, by the silvery or rather ashy hue of its young foliage." Maiden states that *A. dealbata* is called silver wattle, from *the whiteness of the trunk* as well as the silvery or ashy hue of the young foliage. It is evident that this is the terrible spreader by suckers which has been denounced as a nuisance at Ootacamund, because it was allowed to grow everywhere unchecked until it monopolized the ground and afforded cover which was abused with insanitary results. There is an extract from the *Madras Mail* about the desperate war with the plant which had invaded garden and grassland alike. "The myriads of suckers which spring from the extensive and encroaching wattles come up with renewed vigour and amazing rapidity as fast as they are cut down, and form an *inexhaustible fuel reserve.*" Surely that is what

* The *broad-leaved*, typical species can scarcely be feathery?

planters want, even if, as Col Beddome writes, the tree can be depended on only for small firewood. He means from the suckers, no doubt, as the tree grows large and probably the larger, original trees and those derived from them can be successfully coppiced. Even small firewood of good caloric properties will be useful for tea furnaces. Besides the two wattles I have noticed,—*A. decurrens* and *A. dealbata*, to wit.—

A. melanoxylon has been well established in Ceylon, and fine, large pyramidal trees of this wattle are amongst the ornaments of Nuwara Eliya. Many of them are infested by the loranthus parasite,* but a cooly with a sickle or knife at the end of a long pole could easily free these grand trees of their enemies. In cultivated ground, these trees while growing well themselves, send up numerous suckers which speedily rival them in growth. This, which is reckoned their best wood in Australia, equivalent to walnut or ebony, is not so favourably spoken of on the Nilgiris, where it is said to be slow of growth, which it certainly is not here. Even if the timber should, in this forcing tropical climate, not be equal to what the tree yields in Australia, what we mainly want are quick-growing trees, to supply fuel for factory and railway engine furnaces and like purposes

There are others of the Australian acacias which might well be grown in Ceylon, such as *A. acuminata*, *the best of the West Australian woods for charcoal,—good* fence posts—fine ornamental timber, —dark reddish brown, close-grained hard wood;

A. Cunninghami, like red cedar but heavier;

A. excelsa—beautiful cabinet wood with odour of violets.

A. stenophylla, called ironwood on account of its hard heavy timber: close grained, dark, beautifully marked and takes a fine polish. It planes excellently, showing a smooth surface. Diameter 15 to 24 inches, height 40 to 60 feet.

Of the Eucalypts the blue gum yields a fairly good fuel and it coppices splendidly. Where the original trees looked thin and scraggy, the numerous coppice shoots look exceedingly fresh and flourishing. Mr J. L. Anstruther some time ago communicated to the *Observer* a very interesting account of his successful coppicing experiment with blue gums. "Mr. Gass found in the Newman plantation, then 5 to 6 years old, an amount of material equal to 152 tons per acre, and Col. Beddome is of opinion that the best treatment of Eucalyptus plantations, so as to get the greatest profit, will be to cut for coppice every five or six years, obtaining at the cuttings at least 100 tons per acre." GAMBLE, *Manual of Indian Timbers.*

The red gum would yield excellent fuel, were it not too good for such a purpose So with jarrah and others of the family. The eucalypts we find specially mentioned as good for fuel are:—*E. goniocalyx*, "when not used for better purposes it is sought for fuel;" *E. sideroxylon*: "It is one of the best fuel wood of New South Wales for domestic uses and steam engines;" *E. longifolia*, "This wood is in request for fuel;" *E. macrorrhyncha*, "furnishes a fair fuel;" *E pauciflora*, "excellent for fuel;" *E. punctata*, "affords a superior fuel;" *E. siberiana*, "burns well even when fresh." "It is generally considered a firstrate firewood, by some even the very best; in fact the choice lies here between it and *A. stellulata*." It will thus be seen that amongst the acacias, casuarinas and eucalypts of Australia, most of which flourish as well, in some cases better, in Ceylon than in the country to which they are native, are many good fuel-yielders, such are now wanted for cultivation on or in connection with tea estates.

* Our Ceylon substitute for the misletoe.

[It may be of interest to add the summary of the different "Wattles," given in the "Treasury of Botany":—

Wattle. An Australian colonial name applied to various species of Acacia. —, Black, Acacia decurrens; also A. mollissima. —, Green, Acacia decurrens. —, Raspberry-Jam, Acacia acuminata. —, Savannah, Citharexylon quadrangulare and C. cinereum. —, Scrub, Acacia stipuligera. —, Silver. Acacia mollissima. —, —, of Tasmania, Acacia dealbata.

The following paragraph from a Brisbane paper is worth reproducing: the questions were put at the instance of Mr. Kellow. They show among other things that his *A. decurrens* grew 12 feet within the first year:—

"THE WATTLE—H. W. K. (Cooktown, Q): Would you kindly give me through the medium of your valuable journal the following particulars relative to wattle culture: 1, age of tree before cutting; 2, average of bark per tree; 3, mode of harvesting; 4, whether shipped to England or used locally; 5, average rate per ton; 6, would 12 feet in height for Acacia decurrens, under 12 months, be considered good growth for trees raised from seed? Any other information regarding this valuable product would be thankfully received.—*Answers*:—1, from 5 to 10 years; 2, about 1 cwt, though from gigantic trees as much as ½ a ton has been collected; 3, stripping in the ordinary way; 4, both; 5 in the Colonies about £5 per ton, in England it ranges from £8 to £11 per ton; 6, yes. Wattle seed can be sown broadcast, and the tree flourishes on the poorest of soils. The bark contains about 50 per cent of tannin. A ton of bark is said to be sufficient to tan twenty-five hides."—ED. *T. A.*]

ANOTHER BRIGHT BLOSSOMED JUNGLE PLANT—THE GOLDEN WATTLE—FINE GROWING WEATHER—*PINUS SINENSIS*—THE PROCESS OF TEA MANUFACTURE—THE ROLL-BREAKER—BULKING: A MACHINE WANTED—NO HOLIDAY FOR CEYLON TEA PLANTERS—CROAKING PROPHECIES FALSIFIED—INSECT ENEMIES—THE NORTH-EAST MONSOON AT HAND—DELAY IN THE RAILWAY EXTENSION WORK.

NANUOYA, Oct. 7th.

Respecting a second plant, brilliant with white blossoms and abounding in the forests of this region, up to the mountain sides above Nuwara Eliya, in association with the one previously noticed,—Dr. Trimen has been good enough to give the following account:—

"Your plant is another *Hedyotis*—there are a great many of them—*H. Lessertiana*. It has but little of the beauty of its congener, though a stately plant when well grown in damp forests. There is a very large form of it in the highest elevations which might almost be called a tree.

"My memory of the Acacia by the church at Nuwara Eliya does not quite serve me, but I think it is rather *A. dealbata*. Neither *A. decurrens* nor *A. mollissima* I think send up a crop of suckers. I have sent a line as you suggested to the *Observer* Office."

I suspected erroneous information respecting "the golden wattle" so prevalent and so beautiful in Nuwara Eliya. I was struck by the silence of Baron Von Mueller and Professor Maiden, as to any tendency in *A. decurrens* to send up suckers. But if the two trees in Nuwara Eliya which send up suckers so freely are both *A. dealbata*, then its varieties are very distinct. The one which forms the remarkable grove near the church is clean-stemmed, with very handsome, warm-tinted foliage. The other with silvery or ashen-coloured foliage is by no means so handsome a tree. The comparative value of the timbers for fuel purposes is another question.

NANUOYA, Oct. 8th.

I have been considerably disappointed to find so little information available respecting the beautiful

foliaged *Pinus sinensis* which I mentioned as having been obtained from Hakgala and as growing luxuriantly near the Bund of the Nuwara Eliya Lake. Fortune, in his book on the tea districts of India, notices its occurrence without describing it. Gamble does not mention it in his Manual, so that it does not seem to be amongst the foreign plants established in India. Still more strange is it, that neither in Lindley's Vegetable Kingdom nor in the Treasury of Botany is it mentioned. By the name which indicates the tree as specially indigenous to China, I have failed also to find it in that valuable and comprehensive book, Baron von Mueller's "Select Extra Tropical Plants." But I suppose it really is the tree there given as *Pinus Massoniana* (Lambert), which is referred to China and of which it is said that it is "a good sized pine, with widely spreading ramifications. The wood is durable, and when well seasoned, is much employed as material for tea boxes." The Baron adds:—"Professor C. Koch regards *P. Sinensis* (Lambert) as a distinct species." Whether identical with *P. massoniana* or not, *P. sinensis* must certainly be a valuable tree, for it is of this species that Mr. Ford, the Botanist and Forester of Hongkong, has planted out hundreds of thousands in the process of afforesting the British-owned island on the borders of China. Perhaps Dr. Trimen may possess and be ready to impart more definite information regarding *P. sinensis* and its utility as a timber tree to be cultivated on the mountains of Ceylon. Of the exceeding beauty of its foliage there can be no possible question: provided the specimens I obtained from Hakgala were, as I suppose they must have been, correctly identified as the Chinese fir.

From a tree which is associated with the tea plant in China and which yields timber suitable for tea chests, the transition to tea is easy. In the large and well appointed factory here, this morning, I witnessed every process connected with the manufacture of the fragrant leaf, including sizing of the green leaves, withering, rolling, breaking the roll, re-rolling, "fermenting," roasting and binning,—with the bulking and final firing and packing into lead-lined and hermetically closed boxes of tea accumulated in the bins, while still hot from the final firing. For roasting or drying the tea, we have a Davidson's Sirocco, a Jackson's original Drier and a Jackson's Venetian. When we require an additional tea drier, as it seems probable we soon will, we are strongly advised by those whose judgment is worthy of respect to supply the factory with a Brown's Desiccator. What was new to me this morning was the process of breaking up "the roll" by means of a noisy but effective machine manufactured by Walker & Greig. With the attendance of one man it does the work which formerly required the manual labour of four coolies. It has also removed so much necessity for handling the moist leaf, of which no doubt the less the better. For the benefit of the uninitiated I may say that the green leaf, after undergoing a withering process, prolonged or shortened according to the prevalent weather, is rolled by a machine which beautifully imitates while it has happily superseded the motion of multitudinous human hands. In this process the juice expressed in the squeezing and twisting of the leaves causes masses of them to adhere,—masses which, previously to the introduction of the roll-breaker, had to be separated by the human hand, preparatory to being fermented, or, as is now the practice, to a second rolling before the leaf is finally broken up and left to be fermented or rather oxygenized, for true fermentation would mean destruction of the leaf or at any rate of all the properties which make the leaf pleasant and profitable. The second process which specially interested me was that of "bulking" the tea. This is still done here by human agency; and although the handling by the coolies of the dried leaves, which are subsequently submitted to the effects of a final firing, may not be objectionable, yet I can quite conceive of a bulking machine which, while mixing the leaves effectually, would be appreciably labour-saving. The "bulking" of the leaf means such a mixing together of teas made day by day and stored in metal-lined and closely shutting bins, for a week, a fortnight, or a month as the case may be, as will secure a uniform quality throughout, so that, if a sample of one chest is tasted, that sample will fairly represent the contents of the whole of the boxes of the particular description of tea,—broken or orange pekoe, pekoe, or pekoe souchong, our three staple grades in Ceylon. I saw a pyramidal heap of the latter quality operated on this morning. It rested on cloth spread on the floor considerably beyond the base of the heap of tea. At a signal, the dozen of coolies who surrounded the heap drew the tea with their hands onwards on the cloth until a vacant space was left in the centre. Into and over this space the tea was then thrown back, until the pyramid was restored. Then the pulling down and the building up processes were repeated, so that the whole of the daily makings of tea were thoroughly amalgamated. If this process is always as carefully carried on as it was this morning, I cannot understand why our invoices are not invariably accepted as "factory bulked," instead of an exception being occasionally made, as recently, "all except the pekoe souchong," which 'of course' had to be subjected to the damaging effects of being turned out of the boxes on the perhaps damp floor of a London warehouse and repacked into packages the lead of which was probably torn and some of the wood broken. We are inclined to think that London objections to the bulking here are often capricious, but, of course, the varied moods of coolies differ from the uniform action of material machinery; and it seems to me that a really good bulking machine would be a useful addition to our factory appliances. I have never seen such a machine, but I have been told of one which somewhat resembles an hour-glass, the leaf being inserted in an orifice at the top and being spread out as it descends. Perhaps a correspondent of the *Observer* will describe a bulking machine in use and its action,—whether quite effective while appreciably labour-saving. There is one operation of which I have omitted to mention, although I witnessed it this morning, and which unreasoning machinery can never effect. That is the picking out of "red leaf," stalks, bits of coir and other foreign substances from the roasted tea, in which necessary although slow and expensive work women are chiefly employed. By the recommendation of a competent authority the tea cutter has recently been superseded by a process of breaking in which also hand labour is employed. The whole of the processes of tea manufacture, much of which consists of chemical action, are complicated and exceedingly nice in their nature, and require intelligent and constant, and I may add unremitting, attention from year's end to year's end, forming a complete contrast to the pulping, washing and partial drying of coffee, crowded into a few months of the year and leaving room for a holiday or comparatively easy work during the remaining months. We in Ceylon have not even the winter during which tea is inert and planter active in hunting, visiting or holiday-making in India and Assam. It is curious, now that Ceylon tea has obtained so high a place in the world's esteem, to recall the prognostications of Assam

planters that tea could never be a success in an island so near the equator, without a winter and with the raintall distributed over so large a proportion of the year. There never was a case perhaps where preconceived ideas and the traditions of an enterprise were so falsified by actual results. The immunity of our tea from insect and fungus pests is also remarkable. The grubs, brown and white, which were so fatal to coffee in its young and mature stages, find nothing attractive in tea bushes. We could wish they were equally indifferent to nurseries of timber trees and greensward. For small patches of the latter which have been attempted here, the white grubs have a most annoying predilection: what is one day emerald green becoming brown tomorrow, as if sun-withered, although copious rain continues to fall. The number of cockchafer beetles we ever see, seem in entirely inadequate proportion to the prevalence of white grubs. But the latter spend three years underground eating the feeding rootlets of such plants as are acceptable to them before they develope into the winged stage. Even the moths which have been pretty abundant lately are innocuous as far as tea is concerned. For several years now the species which lays its eggs in young flush, the young leaves curling up and withering, has been absent, or if present has altered its habit. There is neither helopeltis nor green fly, red rust nor scale insect to meddle with flush which is so plentiful that work in the factory had to be carried on until ½ past 2 this morning. I speak, of course, of estates within my purview, while I have *heard* of one estate and one only where the prevalence of scale insect necessitated the cutting down of some acres of tea. Free planting ought to be carried out, however, not merely for a supply of fuel, but to interrupt that continuity of one product in widespread expanses, which seems to invite the visitations, such as have proved so injurious to potatoes, and in Ceylon so fatal to coffee. At high elevations, too, the shelter of trees seems beneficial to tea, while their shade does not seem injurious. In Japan, as we have lately read, they shade tea to increase the proportion of theine in the leaf.

THE TROPICAL SUN—THE TEA PLANTER'S ENEMY—CINCHONA FLOURISHING—UBIQUITOUS TEA—ROSES AT HAKGALA—THE SOURCE OF THE MAHAWELIGANGA—GROWTH OF TOONS AND CRYPTOMERIAS—TREES IN NUWARA ELIYA—CURIOUS ACACIAS—A FINE BLUE GUM—ATTRACTIONS OF THE SANATORIUM—THE WILD FLOWERS OF THE CEYLON HILL COUNTRY—PAUCITY OF PLANTS INDIGENOUS TO INDIA AND CEYLON.

NANUOYA, Oct. 7th.

After the morning mists had cleared away, yesterday was, here and at Nuwara Eliya, a glorious sunny day. Indeed the sun during noon and forenoon allowed of no mistake as to our being in the tropics, even when standing on one of the knolls in the Sanatorium at an elevation of 6,400 feet. At the meeting in "The Town Hall" between 3 and 4 p.m., the temperature was oppressive, due I suppose to the heating of the iron roof. In passing through the Inverness forest, *en route*, we were struck by the beautiful white inflorescence, contrasted with the large, deep green glabrous leaves of a tree, which turned out to be the *symplocos* so fatal in tea plantations from a fungus which forms on its decaying roots. But still more remarkable was the profuse and beautiful flowering of fine *Cinchona robusta* trees, of which there are still so many on Inverness estate. Apart from the value of this hardy hybrid, few plants can be more ornamental, the prevailing tint of the flowers being a rich orange-red. If the cultivation of cinchona is to be continued in Ceylon, this is certainly the kind to plant; and if seed is, as it is likely to be, in proportion to flower, Messrs. Cross and Ballardie will be able to supply a very large demand. Meantime I have to report ledgerianas as flourishing at 5,700 feet elevation, where at the commencement of the enterprise they had to be coaxed into growing. Is this valuable species adapting itself to our higher elevations? Inverness, like Mariawatte, shows what a plentiful application of manure can do for tea. In these high altitudes, as might be expected, the young tea plants are longer in "coming away," and the older plants require two or three more years in coming to maturity than in the medium elevations or in "the lowcountry"; but the tea which runs up the side of "One Tree Hill" to the verge of 7,000 feet, shows that the plant with this qualification is at home at nearly our highest as well as our lowest elevations above sea-level—responding fully everywhere to high cultivation and fertilizers. At Nuwara Eliya we met Mr. Nock of the Hakgala Gardens and we were sorry we could not go down to enjoy the spectacle which he described to us: 5,000 blooms on his collection of rose bushes, of which 675 were counted on one bush of "Lamarck." We had our day's work cut out for us in examining the progress of the *Cedrela toona* and other trees on a ten-acre lot of land near "the Bund," where the waters of "the Mahaweliganga," as the river which forms the lake is called in the Nuwara Eliya titledeeds, are thrown back to form a lake. But the Agraoya which rises on Kirigalpotta is really the main source of the great sand river. We found the toons, with their red-coloured heads of foliage, looking really grand in their luxuriant growth and in their complete and striking contrast to the other vegetation around, native jungle or introduced plants. The toons and the cryptomerias (*C. japonica*) which are interspersed amongst them were planted out in Sept. 1886, so that they are now just four years old. We measured a toon, one amongst the tallest, which turned out to be 40 feet high and 16 inches in girth a foot above the ground. The rate of growth, therefore, was 10 feet per annum upwards and 4 inches in girth at the lower portion. Considering the rapid skyward growth the girth is satisfactory, and a few years hence, judging by our 11 years old trees, the Bund toons will devote their energies to the thickening of their branchless trunks. The average growth of the toons in the four years may probably be taken at 34 feet. The cryptomerias have made as nearly as possible half the vertical growth, but a lateral growth more in proportion than the toons, besides covering their trunks with a series of branches from the very roots. One of the tallest cryptomerias which we measured was 19½ feet high with 10½ inches girth. Some Australian eucalypts planted in our grove only lately will soon overtop even the toons. Amongst ornamental trees obtained from Hakgala, prominent for beautiful and luxuriant growth is *Pinus sinensis*. For ornamental purposes it cannot be surpassed even by *Pinus longifolia*. The only question is, as regards economic use, whether its tendency to go off into numerous stems cannot be corrected. Some of the wattles in Nuwara Eliya were in beautiful blossom, but for rich, deep golden bloom the furze or gorse or whins, near Bellwood,—truly a sight of glory,—far excelled the acacias. Pity it is "the lang yellow broom" is not equally successful. New species of Australian acacias have been planted out on the Plain, and the time seems to have arrived when all should be identified and described for the benefit of planters in search of the best firewood plants. The grevillea, which grows so well at

elevations below Nuwara Eliya, is more a timber than a firewood tree, and so, perhaps, is *Acacia melanoxylon*, respecting which observation during yesterday's visit has puzzled us. The old typical, dark-foliaged pyramidal trees have never, to our knowledge, flowered or seeded. But yesterday we saw a tree at the Post Office, with *melanoxylon* foliage but of umbrageous habit in full flower. Not only so, but quite young trees which looked like *A. melanoxylon* had flowers on them, and we were told that a gentleman in Maturata was selling seeds of *A. melanoxylon*. We want "more light" about these curious acacias. We have measured the girth of one of the grand blue gums at the Grand Hotel, and found it to be, at 1½ foot above the ground, 9 feet 6 inches. Its height we did not ascertain, but it probably ranged above 100 feet. There are other fine gums in Nuwara Eliya. The sunny weath r had brought out the north-east monsoon butterflies as well as the flowers, and every feature of the Pidurutalagala ranges, as well as the three peaks of the grand isolated mass of Hakgala, was revealed in the clear sunlight, in which mountains, plains, lake and river were bathed. The balsams, osbeckias (purple and pink), St. John's wort, pink orchids and the white flowers recently noticed, with many others, were in beautiful bloom. The Forest Department have planted part of the vacant space below Nuwara Eliya with cryptomerias, frenclas, &c. When all is planted and grown, a new attraction will be added to the grand drive from the Nanuoya terminus to the mountain sanatorium. But "tappal time" warns me to stop.

NANUOYA, Oct. 8th.

When writing this morning about one of our most beautiful wild flowers, the pure white of which contrasts so strikingly with the bright red of adjacent osbeckias, I forgot to mention what I heard with interest from Nuwara Eliya. A lady resident there, distinguished for literary talent and good taste, has commenced the aggregation of all our wild flowers in a garden specially devoted to the purpose It may convey to some a new idea of the wealth of our upland regions—especially our grassy prairies—in indigenous flowers, when I add that already the collection has reached 150 different specimens. Mr. Nock is giving his valuable and cordial aid to the design, and he will, of course, see that foreign plants long naturalized and recent escapes from gardens and estates are either not included or distinguished by being planted separately or otherwise indicated. When one enters on the investigation, it is startling to find how few plants—economic products especially—are native to India and Ceylon: how much both owe to other countries, especially to the western world. We suppose the plantain is indigenous, and so, perhaps, is the coconut palm,* but is it patent to the bulk of your readers that the pineapple and some varieties, at least, of the custard-apple came to us from America, with the tobacco plant and the red peppers we call chillies, as well as the sensitive plant, passion-flowers, &c. The orange, Bonavia seems to think, came from the Eastern Archipelago and China, although it appears to have existed in Mesopotamia in far back antiquity.

THE AGRI-HORTICULTURAL SHOW IN NUWARA ELIYA.

And this mention of plants and flowers reminds me of a circular which has been issued by the Assistant Government Agent of Nuwara Eliya summoning a meeting at 3 p. m. on Monday next to consider a proposal which has been made for an Agri-Horticultural and General Show at the Sanatorium at the Easter season, similar to the one held in 1888. If there is fair evidence available that such a Show is likely to be well supported, especially by native exhibitors, whose interests it is desired above all others to further by such exhibitions, I suppose the decision will be in the affirmative. On such occasions the various classes of our population are brought together to exchange amenities as well as to compare notes, and the results cannot but be beneficial. I hope it may be possible to conjoin with the Show a Bazaar in favour of the funds of the Tamil Cooly Mission. No doubt our new ruler will patronize the shew if held, giving it éclat by the presence of himself and family. [The resolution to hold a Show has since been announced.—ED. *T. A.*]

October 9th.

The temperature yesterday morning, with a mist-laden breeze from the south-west which tasted of the north-east, was lower than we have had it since the 25th of last month. But as the day advanced there was a clearing up, and the day continued fine with short showers occasionally. But it rained copiously during the night, and we have rain and some wind this morning, though not accompanied by the cold of yesterday morning. Those who have planting to do will rejoice in the rain, which is, after all, seasonable, as a prelude of the more copious deposits which the now near at hand north-east monsoon will bring. The weather will, however, if it continues wet, hinder progress on the railway; and this remind me that the process of laying down the permanent way on the lower portion of the line may be somewhat delayed until the short-length rails, required for the numerous curves, are separated from those of standard size for the straight portions. To persons who do not recognize the necessity of "super-elevation," in the rounding of curves by trains, the difference of level between the two ends of small culverts across the surface of the line on curves seems very strange.—The rainfall for the 24 hours has been 1·30 inch.

EXTRACT OF EUCALYPTUS LEAVES FOR SCALE IN BOILERS—FINE WEATHER AGAIN.

NANUOYA, Oct. 11th.

While discussing trees which are beyond question not indigenous in Ceylon, although they have made themselves quite at home in our hill and mountain regions, it is interesting generally, and ought to be especially so to the officers of our railway department, the owners of engineering works and all who use steam boilers, that in India a liquor from the leaves of the Australian *Eucalypts* has been found very useful in removing scale. Any quantity of the leaves can be had in most of the planting districts of Ceylon for the asking. In a report on the Lucknow Horticultural Garden, it is stated that

With regard to the use of the extract obtained from eucalyptus leaves for cleaning locomotive boilers, Mr. A. E. Ryles, the Locomotive and Carriage Superintendent of the Bengal and North-Western Railway, after a year's trial, pronounces it to be a ready first-rate disincrustator. He obtains 1,000 gallons of strong fluid from a maund of leaves, and finds that from 8 to 12 gallons of it enables a locomotive to run 1,000 miles without it being necessary to wash the boiler out. To experimenters it may be useful to know that when first used on a dirty boiler, the incrustation does not

* The original home of the coconut palm is supposed to be in the Eastern Archipelago—the nuts floating to the Matara coast of Ceylon? [and so eventually giving rise to the tradition of the Kusta Rajah?] Cinnamon has perhaps a greater claim to be considered indigenous than our leading palm?—ED. *T. A.*

begin to move till from three to six weeks, and it takes about six months to remove all the scale. Though slow, it appears to be certain, and should be perserved with. In a communication from the railway officer indicated we find it stated that

The leaves are at present purchased from the Horticultural Gardens, Lucknow, though at most two years hence we will have our own supply from young plants bought from the above gardens or raised in Gorakhpur from seed.

The advertised patent fluid, called the extract of "Eucalyptus Globulus" is sold at R3-8 per gallon in Bombay. We got plants of the Eucalyptus globulus, rostrata and resinifera. The whole of the first died but the other two are growing vigorously, and I do not find that there is any more strength in the liquid from the globulus than from the others, so our supply is certain.

We extract 1,000 gallons of strong liquor from one maund of leaves, which cost us in Gorakhpur R2-8 with R5 for fuel, and cost of labour *nil*;—total one and a half pie per gallon.

We put into a dirty boiler 12 gallons of liquor and repeat it after each trip of from 300 to 450 miles. The action begins after the first trip, and takes the scales clean off the copper box in a month, and is during this time acting more slowly in softening and loosening scale from the iron shell, and still more slowly from the brass tubes.

From my present knowledge of this fluid, I think it will take no less than six months to remove all the objectionable scale from a boiler at a cost of R5 and R3 per half-year per boiler afterwards.

The saving in coal should be many times the above, not to mention the saving we expect in repairs to boilers, as also in washing out water, as I find we can run from 1,000 to 1 200 miles without a wash-out, and without priming. Our old system was to wash-out after every 300 to 400 miles, and then often have to blow off half a glass of water on account of priming before the run was complete.

The scale comes of both softened and in large pieces, and in great quantities, as you have seen. When first it is put into dirty boilers, great care is needed to see the water spaces do not become solid, as the scale will block them if allowed to remain too long without a wash-out.

Altogether, the results so far are very satisfactory, and I will duly report the internal appearance of the first boiler I have occasion to examine as to whether pitting has ceased or not.

The maund mentioned is, we presume, the maund of 80 lb.. and from this quantity of leaves, it will be seen, no less than 1,000 gallons of strong liquor (strongly acidulous, we presume ?) can be obtained. This seems a most important use to which the gum tree leaves, rich in an essential oil, valuable for many other purposes,—including the treatment of diphtheria,—can be put, and we cannot doubt that local experiments after the Indian example will be instituted. The uses of the Australian trees are many and varied. For instance the pine-like foliage of the casuarinas is not only a good fodder for animals, but, as we have learned recently from Madras, a substitute for mulberry leaves in the feeding of silkworms.

Oct. 12th.

After a pretty strong blow of wind from the *north-west* last evening, there is a lull this morning; and it looks as if we were to have another interval of fine weather before the north-east monsoon puts itself in evidence. The rainfall for the 24 hours has been 30 cents, so that in four days we have had nearly 2 inchhees, actual quantity measured being 2·95 inches.

THE SAP OF TREES.

79, Mark Lane, London, E.C., Sept 26th, 1890.

Gentlemen,—I send you a short review of an interesting new work which is attracting considerable otice in scientific circles. The author certainly seems to have made out a strong case in favour of the Sap descending instead of rising—and it follows that if the leaves perform such important functions in obtaining plant food, it can scarcely be wise or economical to prune heavily as is the custom now on certain Tea plantations in Ceylon. Yours faithfully,

JOHN HUGHES.

A keen observer and ingenious experimentalist, has been writing a book on "Sap: Does it Raise from the Roots?" a question which he proceeds to answer with a decided negative. To those who merely "run and read," the whole question and answer may appear as a very slight matter indeed. In reality, however, the right answer to the question is of great moment to us all. In the first place, a negative reply simply means the ruthless upsetting of all our preconceived ideas, the reversal of what has been taught in schools for ages.

It is true that, if we examine into the thoory of plant growth as set down by botanical and biological authorities, we find that they disagree among each other to an astonishing degree. They all, however, join in declaring that trees and plants derive sap from their roots, and breathe in gases by their leaves. How the sap rises, whether by capillary attraction, endosmose, root-pressure, suction, or evaporation, or a combination of all (described by Professor Huxley as pulling, pushing, and pumping), the greatest biologists, including Herbert Spencer, Sachs, Huxley Darwin, and others, have by no means been able to decide or prove. They all, nevertheless endorse the theory of rising sap, and agree moreover that it rises in spring and decends in summer. Now, if all this the rising is proved to be wrong, we shall not only have to alter our school teaching, but largely modify our agricultural practice. Clearly if the roots suck up the soil will quickly become exhausted and require constant feeding, while the leafy parts of the plants must be cut and pruned down. This is the present practice. And it is certainly worthy of remark that our best cultivated—according to the theories of the day—orchards and gardens are those that suffer most readily from blight and disease generally. Our new botanical revolutionist, Mr. J. A. Reeves, with his book on "Sap," tries to prove that we are altogether on the wrong road; that sap does not ascend, but descends; and that gas does not descend but ascends in all trees and other plants. To the unprejudiced physicist and mechanician this theory of Mr. Reeves seems by far the most credible and intelligible. It is, for one thing, strictly in accord with the proved and universally acknowledged laws of gravitation. We all know that water naturally falls, and can only be made to rise under great pressure; absorption and capillary attraction can only raise it some thirty feet in wet wood, practically not at all in dry wood. On the other hand, gases naturally rise, and to reverse the process great force, exceptionally applied, must be brought into play.

These facts brought home must be a fearful stumbling-block to Professor Huxley, though, doubtless, less so to Mr. Herbert Spencer. But we are told offhand that sap descends in autumn and rises in spring. Seeing the impossibility of getting liquids absorbed upwards by dry wood, how can we account for the alleged phenomena of rising sap in the dry trees in spring? In this connection it is remarkable that trees cut down early in the year before they are in leaf will often sprout out some months after they have been severed from the roots and stacked away. Another curious fact is that a tree which has been "ringed" near the ground dies at the root first while the upper part flourishes. Nobody has yet observed the rising of sap. Mr. Reeves has actually witnessed its descent. To do this our experimentalist tested his theory by removing a ring of bark from a growing tree. Soon the sap was seen to accumulate on the upper edge of the bark, while the lower remained dry; the sap gradually descended and hardened in the air. A branch cut close to the tree bleeds profusely in the upper part.

Testing theories is always the safest plan. We find roots the driest parts of plants, the leaves the wet-

test. If we carefully exclude the leaves from moisture the plants die, however much water may be applied to the roots. The roots are particularly dense in texture; the leaves offer a large surface, covered with innumerable little hairs for the retention of moisture, and mouths (or *stomata*) for its absorption. A great variety of trees and plants flourish in the most arid, sandy, and stony soil. If we examine sap, we find that in the leaves and upper twigs and branches it is almost perfectly limpid; it grows dense as it reaches the roots. The maple trees give a plentiful supply of water in the upper part, but the thick syrupy fluid from which sugar is obtained can only be tapped near the roots. All this goes far to show that the water, the principal constituent of sap, is taken in by the leaves and sent down to the roots; it grows thick as it descends by being exposed to the chemical influence of the rising gases. But it is not only water that is taken in by the leaves. The mineral constituents of the tree-blood also seems to be derived from the air and not from the soil*. Independent experiments on a wide scale have clearly demonstrated that our atmosphere is heavily charged with organic matter, dead and living, in organic atoms—the beams which we see in the sunlight-rays of a darkened room. Mr. John Aitkin found that the dust particles in the atmosphere of Cannes fluctuated between 1,500 and 140,000 per cubic centimetre. At the top of the Eiffel Tower 104,000 particles were found to the cubic centimetre; but this fell to less than 23 000 after heavy rain, so that clearly the rain had washed the atmosphere, and taken the organic and inorganic atoms to the vegetation below. At all events the air contains abundance of mineral and other solid food for plants; and when we find the leaves containing more mineral matter and greater colour than the roots, it seems hard to believe that our teachers have been over accurate in instilling into us the theory of rising sap.

Now, as to the gases. We must acknowledge that gases are plentiful enough in the air, but it is beyond dispute that those found necessary for the life and growth of plants are most richly elaborated in the soil. Plants with very deep roots are rarely fruitful. We know that soil dug up from great depths is practically dead, and will not afford a habitation for plants. Earth for successful plant growing must be impregnated with organic matter capable of decay, and consequently of evolving gas. This is an important point from the economic as well as the biological point of view. Fruit trees are found to prosper best and give the largest crops when their roots are near the surface of the soil. Indeed, some of the grandest orchards are partially paved at a depth of a few feet from the surface with large stones or hard pressed *debris*, which forces the fruit trees to spread their roots near the surface of the soil, where the decomposition of natural vegetable refuse and artificially applied manures are in the most active state of decomposition, and consequently in soil richly impregnated with gases. Roots, while ill-suited for absorbing water, can easily take up gases. We find the roots comparatively free from colouring matter and dry, the sap being thick. The gases in rising act chemically upon the sap, the water and its organic and inorganic constituents, and finally escape through the leaves, and even the bark. That a very large amount of gas is given off by leaves, flowers, etc., is an undeniable fact. We crush a leaf or twig between our fingers and obtain a more or less pleasant odour, and that this is due to gases can be easily proved, for many aromatic plants will soon charge the atmosphere of a closed room uncomfortable, sometimes even dangerously, with compounds of oxygen, hydrogen and nitrogen, some of which are probably alkaloidal in character. Indeed, to such a large extent is this the case with certain plants that the natural escape of gas from the rue plant on hot, still nights can be actually set on fire.

All this, it may be said, is very interesting, but what practical lesson does it teach us? The great practical lesson is this—the leaf is the most important part of the tree. If the plant procures its liquid and solid material for life and growth from the leaf, then clearly it is a mistake to be continually lopping and pruning, for by following this practice we reduce the assimilating powers of the plants. This seems to be proved by the fact that heavily pruned trees are constantly throwing out suckers and shoots—in reality endeavouring to extend their foliage in order to compensate for their mutilation. Cultivated trees that are pruned and deprived of their life-giving foliage decrease in strength, and fall easier victims to disease than the heavily-foliaged trees in their natural state. If, therefore, we are to accept the descending sap theory, we shall have to spare the upper branches and cherish the leaves. Again if the sap, the water with its organic and inorganic matter, comes from the air, and the gases from the soil, then the recognition of such facts would have an undoubted influence upon our present methods of agriculture, depending upon arbitrary theories of soil exhaustion and rotation of crops. Agriculture will be as much a science as ever, but a more remunerative one, and our economics of the soil will have to undergo some modification.—*Globe.*

* This is very doubtful, as the mineral portion comes from the soil more likely—J. H.

PADDY, which forms the principal monsoon crop in the Madras Presidency, has this year been planted over an area of 1,272,100 acres, which is a little under the normal area. Gingelly, which comes next in importance, shows a slight decrease as compared with last year, but the most marked falling off is in indigo which has decreased from 191,900, to 114,200 acres. The cause of this is said to be the fall in the price of indigo, and also the late and insufficient rains. The reports from various districts show that the rains have, on the whole, been favourable. Cotton is cultivated over about 70,000 acres, but reports on the condition of this crop have not yet been received.—*Indian Agriculturist.*

NUTMEG CULTURE IN CEYLON.—We call attention to the letter of "W. D. G." further on on this subject. We do not expect that Ceylon will ever be the scene of any great extent of nutmeg, any more than of cacao cultivation, and for the same reason, the absence of good deep rich soil save in exceptional "pockets." But wherever the soil and climate are suitable and the nutmeg is found to grow, we certainly think that special attention should be given to it, even though the planter may feel that his children or posterity, rather than himself, are to reap the benefit. The lowest of "W. D. G.'s" estimates or returns—or R200 per acre—is so good as to encourage not a few to run after nutmeg cultivation.

FORESTRY IN BENGAL.—The Bengal Forest Department is a flourishing branch of the administration to judge from the financial results, which show a net profit for the last official year amounting to over 3¾ lakhs of rupees. The profit is very great in the Sunderbuns Division, from which Calcutta is supplied with fuel, as are also the important sugar and other works scattered through Khulna and Jessore. The Lieutenant-Governor is in favour of strengthening establishments as much as possible in this division, and of making free use of steam launches for inspection, it being generally believed that the revenue here is capable of much greater expansion. It is also desirable (His Honor considers) to free more officers for making working plans—a duty too generally neglected, and this can only be accomplished by reducing establishments where they do not pay, namely, in Chota Nagpore and Orissa. In the latter province work will probably be considerably reduced when the forest boundaries have been re-aligned by the exclusion of village grazing and fuel grounds—a measure to which the Lieutenant Governor attaches great importance in the interests of the cultivators.—*Pioneer*, Oct. 7th.

CEYLON CACAO AND THE DUTCH: WHEN WAS CACAO FIRST INTRODUCED HERE?

The following note appears in the *Trinidad Agricultural Record* for August:—

Extract of Letter from Assistant Director Royal Gardens, Kew, to Superintendent Botanical Department, Trinidad. June 23rd, 1890. "With regard to Ceylon Cacao it is well to b ar in mind that a good deal of this is produced by 'Criollo' Cacao introduced into Ceylon by the Dutch. This, I believe, will account for the fine colour developed by fermentation."

We should like to know where Mr. Morris got this idea: the explanation can scarcely account for the larger proportion of the superior Ceylon cacao.

Dr. Trimen, to whom we referred for information, kindly writes:—

"I have met with no records leading me to think that we are indebted to the Dutch for the cacao tree. I am rather inclined to think that Mr. Moon introduced it early in this century. The first record I have of it is in 1819, when it was advertized for sale in the old Botanic Gardens at Kalutara; and Moon includes it in his 'Catalogue' published in 1824. Cordiner, whose records refer to 1799-1805, does not allude to it as being then in Ceylon. We may, therefore, conclude on the evidence we have, that we got the plant between 1805 and 1819, and probably between 1816 (when Moon was appointed) and the later date. It is not possible to speak with certainty on the point, but it is probable that this was of the 'Caracas' variety, and that many of the trees in Peradeniya and elsewhere are lineal descendants. I find it was still being advertised by the Gardens as for sale in 1833.

"It was in 1834-5 that Sir R. W. Horton obtained a stock of seedling plants from Trinidad. These were cultivated at Peradeniya and at the Pavilion garden and elsewhere in Kandy, and one of them planted in the Army Surgeon's garden there was the source of the cacao on Pallekelle estate, first planted I believe about 1855. There is no doubt whatever that this consignment was of the 'Caracas' variety, and most of this kind of cacao now grown in Ceylon traces its origin to Sir R. W. Horton's importation.

"I am not aware of the date when the cultivation of this fine sort of cacao went out in Trinidad, but it appears evident that it must have been later than 1834, when we obtained it."

We are aware that Bennett ("Ceylon and its Capabilities") is often not a reliable authority, and probably Dr. Trimen has noted and discounted his statement quoted in our "Agricultural Review" (in "Handbook and Directory"). Bennett wrote:—

Theobroma Cacao.—I have had very fine specimens of the fruit in my own garden from trees planted by the late Jacobus Burnand, Esq., a Dutch gentleman whose name is deservedly remembered in Ceylon with respect and regard, for he was distinguished both by his zeal for the welfare of the island, through the introduction of the culture of valuable exotics from the Malay peninsula, and the Dutch islands of Java, Banda and Amboyna, and by his botanical acquirements. The nuts were equal to the finest I had seen at Penang and Malacca, or in the West Indies, and in no degree inferior, either in size or nutritious properties, to the best productions of South America.

All this is, however, quite compatible with Dr. Trimen's belief that the plant was not known in Ceylon before the beginning of the present century.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Sept. 18th.

ANNATTO.—Damp but fair seeds sold at 2½d, and one barrel ordinary St. Vincent at 1½d per lb.

CINCHONA.—Among the South American barks shown at today's auctions were 13 serons Huanoco, one of which attracted attention on account of its unusually fine quality. It consisted of fine medium to stout silvery quill, and sold at 1s 7d per lb. Such fine Huanoco bark has not been seen on our markets for a long time. Good stout brown quill sold at 1s 1d to 1s 3d, thin and broken mixed quill at 10d to 12d per lb. Of 32 bales Carthagena in very large prices part sold at 5½d to 5¾d for stout flat. For 3 sarons good strong quilly Loxa, partly very stout mixed, 1s 10d per lb was paid. The parcel of 134 bales Guayaquill bark, which were announced as coming up for sale, was offered today and mostly disposed of: fine thin even grey mossy quill, 1s 6d; partly silvery, woody 1s 1d to 1s 3d; long, thin brown, more or less broken, from 7d down to 5½d. Of flat Calisaya bark several parcels were offered, and some sales were made at 1s 8d to 1s 9d for good stont rather dark, 1s 5d for damage; these prices were rather cheap.

CROTTON SEED.—The market is quiet. The price ranges from 12s up to 18s per cwt., according to quality. At the auctions 12 bags fairly bright seeds were bought in at 20s per cwt. nominally.

ESSENTIAL OIL.—In Citronella rather considerable sales are said to have been made privately at firm prices. At anction a few drums were bought in. The quotation remains ⅝d to ¾d per oz. on the spot.

CEYLON TEA IN AUSTRALIA—MORE ABOUT MANA GRASS.

Meeting a gentleman this week who but recently returned from a visit to Australia, the question was put to him by me as to how Ceylon tea was getting on there. In reply he told me that he believed a good start had been made and that there was a fair prospect of very considerable success. But he said that he thought it a pity, from all that had been mentioned to him in the course of his inquiry in the several colonies he visited, that no agencies which were directly authorized by your Planters' Association had been established. He believed that if a choice of firms in the leading cities could be made to whom the imprimatur of the Association could be safely entrusted, the use of Ceylon tea would spread far more rapidly than it has any chance of doing under the present system of gratuitous distribution of teas. On my remarking that I had always heard that the difficulty as to this was in the status of your Association,—that i did not pretend to be a business body,—it was replied that the distinction set up was scarcely an appreciable one. "Surely," my friend remarked, "if the Association goes the length of purchasing and sending your teas, even although it expects to get no direct money return of it, it has adopted a business element, and I for one cannot see why it should not extend that adoption, for I am very certain that teas advertised for sale under the guarantee of the Association would find a far readier sale than the unguarded public are now disposed to accord to them." My answering observation was that I had always recommended some such course as he had suggested when endeavor was first being made to introduce Ceylon tea into England; but that without it the tea had become more popularly drunk than any other. "That's perfectly true," was replied, "but the conditions here and the condition in the Australian Colonies are wide apart in their characteristics, and if you don't take these into account you will probably find the progress made in Australia to fall greatly behind what has been achieved at home. Throughout Australia I find a guarantee to be required to induce its people to make a change in their ordinary course of tea drinking. You will find the education to a refined taste much more difficult to accomplish with the coarser palates of the Australian Colonists than you found with the more highly sensitive ones of the upper and middle classes in England."

You will doubtless have hoped to hear from me by this mail more as to the future of the mana grass experiments respecting which my letters have lately given you so much detail. Since last writing it has been told me that the first lot of the grass

which was obtained from Mr. J. L. Shand, and which gave such good results, was grown in districts closely neighbouring on Dikoya, whence the second lot was derived, so that it would seem as if mere locality of growth could not have materially contributed to the differences in result which have been experienced to the several trials made. But "a fresh hare has been started," and by myself, though I am unable to tell you yet whether there is a justification for hunting in a new direction. At all events there was this week shown to me a letter from Dr. Evans with which he forwarded a specimen of the grass (the second lot) as it left the boilers. "Why," I immediately said, "this is no more like what they received at the Poyle Mills and experimented with than chalk is like cheese." Nor more it was. What Dr. Evans sent was pure grass blade, quite unaltered in form from the green (or rather dried) grass. What was taken by me from the sacks at Poyle Mills (as you will recognize from the specimen sent you by me) was just like the heaps of fibre and dust resulting from rotten coir beating. A specimen of this has just been posted by me to the Syndicate in order that they may judge of the difference and make further inquiry, for really it seems to me certain that either some mistake has been made by Dr. Evans or else that the stuff which was sent to Poyle Mills and which proved such a failure in the working was not mana grass at all, but some other product which the firm who did the boiling had under treatment about the same time. Of course it is impossible for me to let you know by this mail whether or not my suspicion on this point can be justified. Personally, I feel very hopeful that some stupid mistake has been made which may account for the discrepancies that have become apparent as the result of the two sets of experiments and which have been so disappointing. But the Syndicate is by no means discouraged. It rightly says that one case of failure cannot negative others in which success has been attained, and its members are determined to pursue the subject fully out, feeling what great results may follow if they are ultimately successful. There is some probability, we now hear, that they may arrange to take over from Messrs. Curtis & Harvey the ton of the grass which, as you were informed by my last letter, that firm has ordered from Ceylon, and may be willing to defer themselves experimenting upon until a subsequent shipment can be obtained.—*London Cor.*

CINCHONA CULTIVATION IN BOLIVIA, SOUTH AMERICA.

The production of cinchona bark, or cascarilla as it is called, from which the alkaloid quinine is extracted, was for many years Bolivia's most important industry in the agricultural line ; but during the last four years it has proved unprofitable, owing to competition in Java and the British provinces in southern Asia. That class of individuals known at home as "smart Alecks" are found even in this out-of-the-way corner of creation. One of these is a certain Señor Shucroft, who was a heavy planter of cascarilla a few years ago, prosperous and presumably happy. One unlucky day the idea struck him of sending a quantity of quina seed to his home government—that of Holland—thereby getting himself into the papers and winning the gratitude of posterity. In uncalled-for generosity he sent a very large amount of seed, with minute directions for its treatment derived from his own experience, and the suggestion that experiments be made in Java. The remarkable success of cinchona in that island led the British government to encourage its planting in Ceylon, and already the business is ruined everywhere by over-production. Mr. Shucroft received a little gold medal from the Dutch king in acknowledgment of his enterprise, but at the same time he lost all his fortune by having made valueless his own extensive cascarilla plantation.

DIFFICULTIES OF TRANSPORTATION.

Bolivia can never compete with those countries that now take the lead in cinchona production, because of her immense disadvantage in the matter of transportation. All her products must cross the successive cordilleras of the Andes on their way to the sea, mostly on mule back, at a cost of transportation not less eleven than Bolivians per hundred weight, an expense five times greater than that of carrying it from the coast around Cape Horn to Europe.

On the other hand, the bark produced in Ceylon and Java yields only two-thirds as much sulphate of quinine as that grown in this part of the world. Fully nine-tenths of Bolivia's cascarilla is of the red variety, known as quina morada. As an example of the rapid depreciation in the price of bark may be mentioned the Erickson plantation, which was valued at 1,500,000 Bolivians five years ago and is now offered for sale at less than a quarter of that amount, but cannot find a purchaser.

The number of quina trees now under cultivation in Bolivia is said to exceed 15,000,000, about two-thirds of them being in the province of Mapiri, near the northern border, whose business centre is Sorrato. The department of Yungas cultivates half a million trees and a great many are grown in the Beni province, farther to the east. It is impossible to get any reliable statistics regarding Beni's productions, because they all go to the eastern coast of the continent via the Amazon and its tributaries. Indeed, there are no printed statistics of any kind concerning Bolivia's exports or imports, and no history of the country was ever written except one small and very incomplete edition in Spanish published forty years ago.

TREATMENT OF CINCHONA.

As to the treatment of cinchona—at this distance from the equator it will not grow at a greater elevation than 5,000 feet, nor lower than 3,000. The seeds, which are sown in beds, are so very small, lighter than the lightest thistle down, that the least breeze will blow them away, necessitating great care in the handling. When the plants are about one foot high they are transplanted five or six feet apart to the sunny side of a mountain. It is asserted that virgin soil is absolutely necessary and that the addition of any kind of fertilizer would be ruinous. Twice every year the earth between the tree is slightly disturbed by the primitive plows of the country, and that is all the "cultivation" they require At the age of eight years the trees are ready to strip, or if the owner is hard up, as is usually the case, a part of them may be utilized sooner and young plants put in their places. In some sections it is customary to remove from each tree about a quarter of its bark every year, but here the tree is cut down to the ground, its trunk and large limbs peeled and the smallest branches carefully scraped clear to the leaves. An eight-year-old tree yields from twelve to fifteen pounds of bark, which in the present depressed state of trade is worthy only about seventy-five cents.

THE QUININE TREE.

If the peeled-off bark happens to get wet, it loses much of its alkaloid quinine ; hence every planter has to build ample sheds in which to dry it. The trunk of the tree, after having been peeled, is entirely valueless, not even good for firewood in a country where fuel is scarce. The cost of cutting, drying and packing the bark is about $1·90 per hundredweight. The process of packing is as follows :—A box is lined with coarse sacking and then a layer of banana leaves. The bark is put in and pressed down with machinery until the box will hold no more and the scale indicates exactly one hundred pounds. It is then removed from the box, banana leaves and all ; a second sack is added and the whole bound tight with raw-hide thongs. There are no fewer than twenty-one varieties of the quina tree, some worthless, others ranging in the amount of quinine contained in the bark from one-half per cent to seven per cent. The buyer must know his business, for if not an expert he is likely to be badly sold. The "gold brick" swindle has not been so often perpetrated in the United States as that of selling for cascarilla the worth-

less bark of some other tree. A well known dealer of La Paz, who ought to have known what be was about after years of experience, recently lost $160,000 at one fell swoop on a ship load of bark supposed to be cascarilla, but which, when arrived at the English market, turned out to be a species of oak, good for nothing at all. The only way to test the bark is by tasting it. That which gives out a bitter taste immediately on being taken into the mouth will yield a comparatively small amount of quinine, while the best must be chewed before the quinine taste is apparent.—*Exchange.*

NATIONAL WOOD SUPPLIES.

Bulletin No. 4, just issued by the Division of Forestry, is a sequel to some previous publications of the division which discuss the relations of railroads to the wood supplies of the country, with reference to the conservation of our forest areas. It contains a brief discussion by the chief of the division, setting forth upon the basis of a recent canvass among the railroad companies the enormous consumption of wood material for railroad construction, and especially showing how future supplies are being endangered by the use of the most valuable timber and of the young growth. To satisfy this demand requires the annual culling of the best timber from probably more than 1,000,000 acres of our natural forest lands. The chief value of this part of the bulletin consists in the directions which are given for increasing the durability of wooden ties. These are found to last on the average less than seven years, so that for replacement alone an annual cut of 80,000,000 ties is required. By lengthening the life of the tie a single year it is evident that a considerable saving would be effected, tending to reduce transportation charges and also to husband our forest supplies. For lengthening the durability of ties various means are suggested, among which are the selection of lasting timber, proper care in the seasoning of material, attention to the drainage and ballast of the road-bed, precautions against fungi, improved methods in fastening rails, and various preserving processes, some of which are new. The information here furnished is likely to be of value to any consumer of wood material.

The bulk of the bulletin is taken up by a report of R. E. Tratman, C. E., collating the experience of the world in regard to the substitution of metal for railroad ties. It had been stated hitherto that metal ties were used experimentally, but that the time for their introduction was still far distant. This report shows that not only are there something like 30,000 miles of railroad track of the world laid on metal ties, but that where these ties have been used most extensively, namely, in Germany, India, and the Argentine Republic, they have shown themselves superior to wooden ties in producing a safer, more permanent, and in the end more economical track.

The report is exhaustive, full of the detail which alone can make it valuable to the engineer, and promises to be an important aid to the metal tie question, which in this country has received little consideration, from the belief that it is either impracticable, or with our seemingly inexhaustible timber supplies premature. The use of the metal tie is expected to economize wood supplies and by its cheaper maintenance and other favourable features to reduce transportation charges and increase rapidity and safety of travel.—*American Grocer.*

TEA NOTES: DARJEELING, Sept. 20th.—Some very good sun commencement of week, which has brought on fair growth. Foggy though latter end, with rather too cold rain to make heavy flush. Rainfall to date 121 inches.

CEYLON TEA IN RUSSIA.

To the Editor of the *Tropical Agriculturist*, Colombo.
Kandy, Oct. 11th.

SIR,—I beg to enclose letter received from Mr. M. Rogivue on the subject of making known and pushing the sale of Ceylon tea in Russia.—I am, sir, yours faithfully, A. PHILIP, Secretary.

Moscow, 30th Aug./11th Sept. 1890.

A. Philip, Esq., Secretary, Ceylon Planters' Association, Kandy.

TEA FUND.

Dear Sir,—I wrote you last from St. Petersburg on the 23rd July/14th Aug. I have since been in correspondence with Mr. Wm. Martin Leake of London, to whom I have asked to communicate to you the contents of my letters.

ST. PETERSBURG.—As I have already informed you I visited there all the principal tea merchants, most of them were in Nijni at the time, but everyone I have seen has tasted my samples of Ceylon teas, and before leaving that place, I have left to Mr. D. Haverlandt, who will act as my agent there, all the necessary instructions by samples to continue the work, see the people and push the business. I hope that orders will soon follow, when the parties interested return from Nijni.—I have also distributed more than 150 lb. of tea, in 1s 8d and 1s 4d lb. packets, all over the town, to restaurants, tea houses, public bars and friends.—The general report is that the tea is good. More was impossible for me to do, I had to leave for Moscow, having been in St. Petersburg quite enough time, a little over than one month.

MOSCOW.—I arrived here on the 13th/25th August and lost no time in visiting the firms interested in tea, such as

Alexis Gonbzin's successors (Héritiers) A. Kousietzoff & Co., the first and best wholesale tea house in Russia.

Vve. Rostergueff & Successeurs } Second best
,, Catairo & Fils }
Wogan & Co. }
Quizinoff Bros.
Behrend and Stern &c. &c.

and Popoff Bros. & Co., first retail tea house in Russia having over 30 warehouses and shops in every large town, such as St. Petersburg, Moscow, Odessa, Riga, Varsovia and other places all over Russia.

Most of their principals being in Nijni, I thought best of going there to see them. I did so last week. They have all taken great care and trouble in tasting my samples, compared them with Chinese kinds, Caravan and others—and, I am glad to say, reported very favourably upon their quality which they say, is on the whole far superior to that of the equivalent grades of Chinese kinds, against which the present general complaint is, that they are getting every year more and more inferior. They find our teas well made, of fine flavour and good liquor, but would prefer them of somewhat darker infusion than the ones I had to show them, viz.:—

"Aberdeen" }
"Mahousa" }
"Patiagama" }
"Ferndale" } Pekoes.
"Glengariffe" }
"Labukelle" }
"Rahatungoda" }
"Labukelle" } Pekoe Souchongs.
"Kuruwitte" }

The "Labukelle" and "Rahatungoda" pekoes have been found the finest of all these teas, but rather too pale of infusion, and, as pointed out above, teas of a darker colour in cup, which would keep about the same for the second and even the third infusion,—the same as Chinese teas do—would be preferred.

I remarked in my previous letters the way of making tea in Russia, viz:—To pour in the tea pot—sometimes up to four times—boiling water on the same tea; the first infusion is of course darker than the second and so on, but the last must still have enough colour for appearance's sake, although there is no

more, or very little taste remaining in it, and this is the reason why tbe Russian market required dark liquored teas, just the contrary than what I had heen told in London, where very little indeed is known about Russian tea husiness.

This, of course, applies chiefly to teas sold to the general public in Russia—the common people—which are the largest consumers. Better classes drink hetter tea and some of them make it better with one infnsion only—broken pekoe of any "Labukclle" sample or equal to it—would do for them very well, but, as a rule, fine and finest teas are sold in much smaller quantities than common and medium to good ordinary qualities.

Now, as to the question: "Whether Ceylon teas will suit the Russian taste," and "whether they can he introduced in the country, to be drank as pure Ceylon teas and supplant or replace Chinese kinds," there are two ways of answering it:—The large and wholesale Merchants will say, no, but I have no hesitation in saying yes! The wholesale merchants—importers—much more conservative, in their way of trading, than the consumers, in a matter of taste, pretend that Ceylon teas cannot be drank by themselves—pure—and appreciated hy the puhlic for their merit, because they are not known well enough and do not suit the Russian taste. This is their old and only song, and they say, that they can only be used for hlending purposes, mixed with Chinese teas, and it is easy to understand that these importers who, finding their profit in selling to retailers, mixture of any kinds of all sorts of teas, which they have introduced, and have made known, will not take the trouble now to introdnce any new kind, against which they have at first, a sort of antipathy and which they think could perhaps stand the risk to remain for some time unsold in their stores. The Retailers think exactly the same, and the Public—the consumers—who up to the present time, have never had the opportunity of seeing, buying or drinking anything else but what was offered and sold to them in retail shops, are therefore cut out entirely of "Pure Ceylon Tea," and cannot get at it! In St. Petersburg and here, I repeat it, everyone, friends and others, who have tasted my samples, have found them excellent, cheap, even in the good qualities, and economical, and have asked me where the tea could be bought in retail; this of course I was unable to answer just at present for the simple reason that nobody sells it pure, but I told them that it would be the case before long.

In Nijni-Novgorod, installed in the shop of a friend, a watchmaker, visited hy a large number of people of all classes, Russians, Siberians, Tartars, Armenians, etc., etc. I bad some of my samples made in cup and offered, to every visitor, some of it. The voices were unanimous to declare the tea very good and cheap, and who 10 lb., who 20 lb., etc. everyone, wanted to huy some; and asked me where to get it, but I could not sell my samples—having no license for retail. The fine in Russia is a heavy one, for the sale of any article without a license.

This is to show what the general puhlic think of these teas and that they would buy them if they were to he got anywhere in Russia, in retail. And I can say, that to only friends and acquaintancos, here and St. Petersburg, I conld, at once, scll over 1,000 lb. of tea at a good and very profitable price, if I had a stock and a license.

Mr. Hadimiroff (in Nijni) head partner in the large firm of A. Dousentzoff & Co. has taken special trouble with my samples and pronounced himself very pleased with their quality; he is of opinion that Ceylon teas will have, before long, their time in Russia and be drank extensively all over the country, will sell well and replace advantageously the Chinese kinds, which are getting now so bad and inferior in quality. He promised me to give a trial order of some importance, on his return to Moscow—in about a week's time—but says, that it would not do for his Firm to advertise and make a Réclame for the tea:—Large and wellknown Firms (wholesale) in Russia it appears, do never advertise.—This I do not understand and I am afraid that, here again,—even with a large order from this Firm—we shall miss our object in bringing the article, as "Pure Ceylon Tea," within the direct reach of the consumer.

I have already written extensively on the question. I consider that I have also done a great deal of good for the object of my missions, although it is nothing when considering what remains to be done,—and I come now to the conclusion that, the only way of introducing "Pure Ceylon Tea" in tho country, quickly and surely, is to give the public the opportunity of buying it as such, and this is only feasible by opening here. Moscow is the centre of Russian business and the largest market for tea. And for other places, depôts of Ceylon toa and retail warehouses for its sale. The first enterprising man to do it will make his fortune in no time. It will be objected, I am sure, that the very fact of his doing a retail husiness might influence the wholesale trade in combining to shut him out of the market altogether; this may he correct but, I repeat it, the importers, although perhaps willing to give a few orders will only use Ceylon tea for blending purposes and will never introduce it to the reach of retailers and consumers—for its own merit, whatever it may be, good or bad,—to prejudice another article they have already introduced, and are selling easily and advantageously and, supposing even that some of these importers give some orders of a few hundred chests during the year, just as they did, through London houses, before my coming here, mix the tea with some other kind and take perhaps one year to sell that quantity and order a fresh lot, here ends the business and the aim your Association proposed, in sending me here, is not attained.

In accordance with the foregoing remarks, what I would like to do, is:—

1st. To have here, in Odessa, Riga, St. Petershurg and even Varsovie, stocks of Ceylon tea in low medium and fine qualities of pekoe and pekoe souchong, very little broken pekoe,—say ahout 2,000 lb. of sorted in each place to begin with, of well made teas, not too black, of good aroma, mild, mellow and soft flavor and liquor, not too pungent, but of somewhat dark-reddish coloured liqnor.

2nd. To open a small office in Moscow, and

3rd. A few retail warehouses at above-mentioned places, in order to sell tea by packets of ⅛, ¼, ½ and 1 lb. or more voluminous packets, by chests and otherwise, and

4th. To start a well conducted Réclame by means of Government analysis—published in newspapers, advertisements, circnlars, placards, pampblets, etc., circulated and distributed all over Russia.

In my opinion, this would be the only possible way of obtaining success and, I am sure, would prove, before long, a very good and most remunerative business, which could also he extended to other products of Ceylon and export of Russian produce.

Duty paid Chinese teas, mixtures or others, are sold in the country from Roubles 3·50 kop. downwards to Rbl. 1·25 kop. per Russian Pound, as per quality, and taking a Ceylon pekoe or pekoe souchong, superior in quality to the lowest Chinese or mixture tea, sold here at Rbl. 1·25 kop. Something for instance equal to my sample "Kuruwitta" pekoe souchong, bought in London, first cost at 9d per Eng. lb.

charges to Odessa, Riga or St. Petersburg	1½d	„	„
about ½ penny per lb. to be added for railway freight to Moscow	10½d	„	„
and say Rbl. 8·30 per £ str. average rate of exchange, equal to	37 kop.	„	„
plus	89 „	„	„

for duty, customs and other charges would cost Rbl. 1·26 per English ponnd or (1/10th less for Russian ponnd) Rbl. 1·15 at any of the above sea ports or Rbl. 1·17 in Moscow, which tea selling at only. Rbl. 1·25 here would leave a gross profit of 8 kopecks per ponnd. This calculation is based on the clearing at St. Petersbnrg of my 671 lb. samples, but dnty, customs and other charges could be considerably reduced on a larger quantity imported at a time and of course duty alone being the same on ordinary and fine teas, the profit would he mnch larger on the latter qualities.

Shipments to Odessa direct from Colombo, would again be more advantageous and when shipped by the steamers of the Russian Volunteer Fleet could be stored free of rent for any length of time, in the Company's bonded warehouses; this has been offered to me by Mr. Vachtine, Director-Inspector of the Company.

As to quantities to be sold the future will show it as soon as Ceylon teas begin to be known in the country. I do not like to anticipate with figures, but it may interest you to hear that it is calculated that the firm Popoff & Co., the largest retail tea house in Russia, is selling alone over 50,000 pounds of tea daily in their various stores all over Russia, and supposing that I would sell only 10,000 lb. per month for the first and even the second year, or 120,000 pounds a year,—and this quantity I have, no doubt, would be easily reached—at an average profit of 15 kopecks a pound only, this would leave a gross profit of 18,000 roubles to cover expenses which I estimate about as follows:—

		Rbl.
Réclame, advertisements, circulars placards, cards, printing, etc.		5,000
	For one Year.	
Rent of office in Moscow	500	
Furniture for same	250	
Wages to men	500	
My own expenses	2,000	
		3,250
Rent of 5 warehouses and furniture... ...		6,000
Five Licenses at Rbl. 200		1,000
Wages to 5 warehousekeepers		3,000
Interest, insurance and travelling expenses ...		1,750
	Say, Rbl.	20,000

Thus clearing in the first year all the expenditure and stock-in-trade as I do not admit that the profit is to be only 15 kopecks per pound of tea—this can easily be doubled. The article is then introduced with all probabilities of a splendid and increasing business in the following years.

For this, a capital of about Roubles 25,000 would be necessary to cover the first advances and start the business on a sure footing viz. Duty and charges are 10,000 pounds of tea say a

rouble 1 per lb.	Rbls.	10,000
First urgent réclame to be made in starting	"	2,000
½ year rent in advance for office and five Warehouses	"	2,000
Furniture for office and Warehouses	"	3.000
Five licenses	"	1,000
½ year Wages, Salaries, Insurance in advance	"	1,500
Travelling expenses and sundries	"	500
Roubles	"	20,000
plus about £st600 or say	"	5,000

To cover the value of about 10,000 pounds of tea Cost, freight and Insurance at one Russian Port. Or say about £st3,000 to float on a good scale, the whole concern which could be, of course, extended later on proportionally as for the yearly results of the business.

Now for the enterprising man to advance this money, I have no hesitation in guaranteeing him the success. This would be a good thing for a Colombo firm interested in tea business. Remember that all the tea retailers in Russia have made their fortune and are wealthy people, and that as Mr. Vladimiroff told me Chinese Teas decreasing considerably in qualities as well as in quantities, it is now the very favorable time for introducing Ceylon Teas in Russia.

Moscow will have next year about June 1891 a large exhibition, and I think that Ceylon ought to be well represented with a large kiosk for tea and a good collection of other Ceylon produce.

Please give the foregoing your very earnest consideration and place these remarks before the Committee of your Planters' Association "Tea Fund" who, I hope, will understand that to do such a difficult work like the one I did undertake to do, I must be well supported by means of more liberality.

As regards Funds: It is useless for me to repeat that the £st100 granted to me by your "Tea Fund" Committee was quite inadequate and insufficient to do what I have done up to this day travelling from Switzerland to London, where I had to stay over a fortnight, to St. Petersburg, via Berlin and Königsberg two days in each place, and over one month's stay in St. Petersberg, to Moscow and Nijni Novgorod and stay of already three weeks between both places! When you add to this, all sorts of expenses such as duty and charges on Tea samples over £st80! Printing matters, carriages, hire, packing of tea, rent of godown, interpreter, tips, postages, &c., &c., you may easily believe that I have already spent over than double that amount of which more than £st100 are out of my own pocket, considering moreover that I only received £st86 out of the £st100 granted, Mr. Leake having kept the balance of about £st14 to cover the surplus of Messrs. Malcolm Kearton & Co.'s invoice for Tea Samples, which I had to increase over the £st30. granted by the "Tea Fund" Committee for their purchase in order to complete my assortment in every desirable grade and qualities suitable for the Russian market. I may just as well inform you that I am now left here without money, in the most difficult position and not knowing what I have to do: "Abandon the field and return home" or "Hang on a little longer with the hope of getting a further allowance from your Committee to enable and to continue my work"?

But as winter is drawing now very near, I should like very much to know, before long what is to be decided.

I do fear to remain during the winter, idle and without means, in a country like Russia, where the life is so expensive, and I would be very thankful to your Commitee to take a decision without further delay.

It is quite true that it was my own proposition to come to Russia and that the amount I have been granted for my expenditures, was the figure stipulated by me. When I estimated at a £st100, the approximative amount of my expenses, I did it in perfect good faith not knowing what a country Russia was. That the duty on Tea was so high, and with the hope that the "Tea Fund" would be liberal to me after a first start here as expressed in the resolution of its Committee. It was only in London that I heard more positive information and I remember having heard Mr. J. Capper saying:—That it was ridiculous to expect anyone to do this work with so little money quite inadequate to it. My previous reports from St. Petersburg have proved it superabundantly, but I left London for this country encouraged by many that the Ceylon Tea Fund Committee would understand my position and reconsider their former decision.

I acknowledge having made a mistake in my estimate of expenditure, but is it a reason why the scheme should now be abandoned, when I am so near and so hopeful of obtaining success, and should the first money spent, be left behind without return at all? With my work not even half done. This would be a very sad conclusion to my mission! I do not pretend having shown yet any satisfactory results, but, I consider having done already good work, and I am sure that I could obtain a complete success if more money was to be spent and if I was well supported in my above proposals. Why could not a Company be floated for this purpose in the same way as Mr. Pineo did it for America. This is well worth considering by your Ceylon merchants and capitalists. The capital required is not a large one and I think shares could be easily placed.

Duty on every article or produce—except tea—imported in Russia has, since a week, been augmented of 20 per cent.

The Nijni fair was a very interesting sight, it closed last Saturday, the 25th August/16th September. Confirming my card from these, I beg to remain, dear sir, yours faithfully, M. ROGIVUE.

1st/13th Sept.

I have written to Mr. Leake regarding the packing of Ceylon Tea, he must have communicated my

remarks to you and I hope that something will be doue in Ceylon to improve the packages, at any rate for shipments to Russia.—My present address is care of Madame Mathey, Maison meublée, Grande Nikitsky, Moscow, and in case a telegram should be addressed to me, Rogivue, Mathey Nikitsky Moscow, would do. Again yours faithfully, M. R.

A FUEL SUPPLY FROM WASTE GRASSES.

The rapidly narrowing field from which our needed supply of fuel can be drawn, and the widening demand due to the consumption necessary for the curing of tea, justify us in considering every possible suggestion that can be made for averting a difficulty already felt and promising soon to increase in seriousness. With many suggestions emanating either from correspondents or started by ourselves we have dealt on previous occasions, and we do not propose in this article again to discuss them. But few of these have been put to a practical test, and it is impossible, therefore, to say whether any of them will fulfil the hope entertained of them or not. But just now very much interest is felt at home in what have hitherto been the waste products of the island, and the more the utilisation of these can be promoted, the greater the gain, both present and prospect, to the Colony.

As an instance of such utilization, we can well recollect the time when the accumulation of coffee husk or chaff in the Colombo mills of that day was found to be a positive nuisance. Trials made, however, proved it to be an admirable fuel for steam boilers, and while the supply could be kept up we believe every steam factory in Colombo fired with this material. At the Government Factory its use gradually superseded that both of wood and coal, with the result that a very large saving was effected. That was a single case in point, and it emboldens us to write further on a subject with the technicalities of which we do not profess to be acquainted, but which, under the circumstances, may be found to be deserving of some thought by those whose interests are becoming greatly affected by the scarcity of fuel within our planting districts. We have but lately been informed by our London Correspondent, that Messrs. Curtis & Harvey, the well-known manufacturers of fine gunpowder, believe that it may be found to pay them to import from Ceylon a quantity of mana grass for the purpose of making charcoal. Now in the production of that article a very great amount of heat is evolved and lost. The question is, whether from the many varieties of grass which cover waste lands in this island charcoal could not be made in a special apparatus, the wasted heat from which could be availed of to do us valuable service while leaving the residue as a marketable commodity? If this could be accomplished a distinct step in advance would be made towards solving the difficulty apprehended as to our future fuel supplies.

Of course we know that dried grasses of this kind burnt in an ordinary furnace would be simply flashed away uselessly by the strong draught, and would leave an ash certain to choke the bars and flues so as to completely check after-combustion. But, assuming that they were fed into some kind of incinerator which would utilize the heat of the gases evolved for general purposes, leaving behind a pure charcoal, it is possible, we think, that if the latter were possessed of sufficient value for export or home use, this question of fuel supply might in a great degree be satisfactorily solved. As to this last point, we can only say that if Messrs. Curtis & Harvey believe that it would pay them to import the grass and burn it into charcoal at home, there is good ground for us to believe that it would pay our planters to transform it on the spot, using the wasted heat we have written of for their own purposes and exporting the charcoal produced. We must leave it to those better acquainted with the character of such processes, to determine whether or not the idea that occurs to us is in any way feasible. As we have on previous occasions said, we do not offer our suggestions on this and kindred matters with any conviction of their full practicability. But there is often a shade of truth and a grain of practicability even in the most crude ideas; and in the face of anticipated difficulties we do not hesitate to propound any scheme which might from bare theory be advanced by experts to practical usefulness.

NOTES ON POPULAR SCIENCE.

By DR. J. E. TAYLOR, F.L.S., F.G.S., &c., EDITOR OF "SCIENCE GOSSIP."

Some months ago I drew attention to Mr. D. Morris's paper, read before the Linnæan Society, on the fruit of the sugarcane. The practical result of that paper is that seedling sugarcanes are now being grown in Kew Gardens. The Government of Barbadoes took up the question in great earnest, and they have just published a valuable report on the seedling sugarcanes, in which are fully recorded the interesting results obtained on the experimental fields at Dodd's Reformatory in that island.

I observe that the Italian navy has recently been trying a new fuel—a mixture of kerosene and coal-dust. The men-of-war thus fired are said to have increased their speed by its use two knots an hour. This will be very convenient in war time for a battle ship to get away. However, one drawback is recorded—the increased heat seriously affects the boiler-plates. Then who is going to sit on the safety-valves?

You have in Australia nearly all kinds of climate and physical conditions for the growth of plants. It is no good drawing anything that the world does not want. Therefore, the following facts may not be without interest. Perhaps we should never have heard of India or the Malayan Archipelago, nor would Europe have been embroiled in a host of wars, if it had not been for the spices those lands produced. With the increased growth of the world's population the amount required is of course increased. Take cloves for example. Not only are these rice fruit-capsules the most pungent of spices, but an important oil is now extracted from them for microscopical and other purposes. One cannot wonder, therefore, that the cultivation of cloves has become a speciality. Sixty years ago the plant was introduced into the Island of Zanzibar, so that it may have influenced the Arab slave trade, just as the introduced cotton-plant is historical associated with the importation of niggers into the Southern States of America. However that may be, the chief supply of cloves now-a-days is not from India but from Zanzibar, where it has been cultivated to a high state of perfection. In that island a ten-year-old plantation of clove trees produces an average rate of twenty pounds of cloves per tree, while trees twenty years old frequently produce fully one hundred pounds. It is stated that the yield of cloves from Zanzibar alone for this year will amount to thirteen millions of pounds, the average market price being 5d. per pound. Surely, in many of the tropical regions of Australia there must be opportunities even for planting clove trees.—*Australasian*

RICE GROWING.

The accompanying figures and information may prove useful as shewing the value of Rice planting. The land planted was the bottom of ordinary drains in portions of laud laid out as Banana and Cocoa plantations. It is not general in Trinidad to take advantage of the drains to raise a crop, but the experiment shewn here proves that it can be done without

damage to the drains or detriment to the land. In fact to a cocoa planter growing Rice in the drains, especially on flat land is a perquisite, and now that indentured labour is being employed on such estates there is everything in its favour, for sufficient Rice might be grown to furnish the labourers with their staple food for the year, and this might be done year by year, as the decomposed vegetable matter on the higher ground washes into the drains and remains there to a great extent would thus supply manure to yearly raise a crop of splendid Rice. Shade dces not appear to interfere with the growth or ripening of the grain, this has been fairly tested for three seasons on land fully shaded by the large growing gros michel banana. The general result compares favourably with Rice growing on open ground.

No. 1.—SOWING IN JUNE.

Collected area of drains 9,220 square feet or little less than one acre.

		£	s.	d.
Rice for seed ...	38 lb @ 1d. ℔ lb ...	0	3	2
Sowing	3days @ 1/0½d. ℔ day...	0	3	1½
Reaping	21 „ @ „ „ ...	1	1	10½
Threshing & winnowing	12 „ @ „ „ ...	0	12	6
Cost of Labour, &c. ...		£2	0	8

Reaped 1,250 lb Rice, weighed after threshing @ 1d. per lb=£5 4 2.

	£	s.	d.
Value of Crop	£5	4	2
Labour, &c.	2	0	8
Profit ...	£3	3	6

No. 2.—SOWING IN JUNE.

Collected area of drains, 12,800 square feet, or rather more than 1 acre.

		£	s.	d.
Rice for Seed ...	21 lb @ 1d. ℔ lb ...	£0	1	8
Sowing	5 days@ 1/0½d. ℔ day...	0	5	2½
Reaping	34 „ „ „ ...	1	15	5
Threshing & winnowing	12 „ „ „ ...	0	12	6
		£2	14	9½

Reaped 1,350 lb Rice, clean in husk @ 1d. ℔ lb £5 12 6

	£	s.	d.
Value of Crop	£5	12	6
Labour, &c.	2	14	9½
Profit ...	£2	17	9½

No. 2 shews a larger area planted with not such good results as No. 1. This is accounted for by roots not being so well cleared out of tho drains of this portion.

From experiments I find that by cleaning the Rice from the husk in the primitive way the Coolies clean theirs, a loss of ¼ lb. takes place. This would bring the weight of crop to 1,950 lb. Two coolies can clean 60 lb per day. The total result would be as follows:—

	£	s.	d.
2,600 lb less ¼ lb = 1,950 lb @ 1d. ℔ lb. =	£8	2	6
Deduct 2 men, 30 days, @ 1/0½d. per day =	3	5	0
Profit on 2 acres ...	£4	17	6

Tho sowing was done by Coolies in their own style, simply passing up the drains and at every few inches making a scratch with the hoe, dropping in the grain and at the same timo covering in the ground with the foot. Nothing further was done until harvesting. Of course, the rest that follows is well known, as the Coolies may be seen going through the operation any day of the year at their doors. With machinery for winnowing and making white rice, much more favourable results could be obtained. But the experiment is worth trying, it could be done on shares with the labourers or contractors, or the proprietor might take the whole risk which I feel satisfied would not be great on favourable land.—*Agricultural Record.*

THE FUNCTIONS OF THE BOTANIST

were thus indicated in a lecture delivered by Mr. J. H. Hart, F. L. S., Superintendent of the Royal Botanic Gardens, Trinidad:—

The study of Botany is too wide for any one man, but yet the teaching of the first principles of the science is essentially necessary to a purely agricultural community, and should form one of the first considerations of our educational sytsem. That teaching also which gives a knowledge of what are known as the lower forms of vegetable life is coming daily more necessary to all sections of every community, for how few are there who are aware that as the vegetable kingdom provides for the sustenance of the human being, so also does it produce agents which are destructive to the human body. The many germs of disease which are present among us have been found of late years to belong almost entirely to the field of botany. The ferments without which even our bread cannot be made, our wine, or tobacco, prepared, are known to be caused or set up by infinitesimal organisms which belong to the vegetable kingdom. The fungi which causes dry rot in houses—spoils the taste of our wines, and turns sweetened liquor into vinegar—the bacteria of fevers, and other diseases of man and animals—and also the germs which cause and propagate disease among so many plants, are now referred almost entirely to the vegetable kingdom. There are of course the harmless, as well as the destructive and baneful species, and it is a part of the work of botanists to find out their life history to enable those whose special work it is to counteract the influence of those which have mischievous effects upon either plants or animals. So much has this become the work of Botanists that in stating the qualifications for a recent botanical vacancy it was especially laid down by the Legislative Council of that Island that the incoming officer should be a competent Bacteriologist. Travelling into a secluded part of Jamaica shortly afterwards I was entertained by the District Medical Officer, and the subject of Bacteriology was introduced into the conversation through it having lately appeared in the newspapers in relation to the before mentioned appointment, but I was completely stumped when the venerable doctor asked me the meaning of the world Bacteriology. It was evident, therefore, that the old gentleman was not able, or only able by "rule of thumb," to crush an enemy of whose form and habits he was entirely ignorant, and I ask you to whom would you sooner trust your lives—to the hands of a man who keeps up with the progress of medical science, or to one of the old school practitioners who prefers to fight the enemies of human life without a knowledge of the character, form, magnitude or life history of the organisms which cause disease in its various forms? Thus the first class Botanist, instead of being merely a walking dictionary of long names, has to become a microscopist, and to be a microsopist, has to possess a primary knowledge at least of the elements of Chemistry. Botany is therefore elevated among the list of important modern sciences of late years, for no medical student can become competent unless he knows the series of facts which the science of Bacteriology teaches. Only a few years ago it was, I believe, almost impossible to diagnose with any degree of certainty the state of the human lung known as Tuberculosis. While now with the aid of scientific facts recently brought to light, that disease, Leprosy, and many others (daily increasing in number) are each to be readily determined by the presence of the special Bacterium which is peculiar to each disease.—*Royal Botanic Gardens Bulletin.*

MANA GRASS EXPERIMENTS.

It has not been possible for me since last writing to have the mystery about the Mana Grass last experimented upon cleared up. There is such a strongly marked difference, however, between the specimens of the boiled outturn, that my confidence that some careless error has been made must remain until it

can be indisputably upset. During the week opportunity has been afforded me to test specimens of the grass which have been long subjected to steeping in water only. It was possible to draw from the stalks so treated two very distinct characteristics of fibre. Those stalks which were well matured gave a long and comparatively tough fibre; those of a more immature growth yielded a very short fibre on being separated by the fingers, and this broke readily. It, therefore, seems very feasible that Dr. Evans's suggestion that the two lots of grass experimented upon had been gathered at different stages of growth, and that the fact might account for the variance in result obtained during the experiments made, may have been a correct one. But at present this point remains undecided. It has been told me that a proposal has been made to the Stanley-Wrightson Syndicate that it should take steps to obtain from Ceylon a complete collection of samples of wild growing grasses, each sample to be distinctly labelled with all possible information regarding stage of growth, locality of production, &c., and that these should be submitted to careful laboratory testing. This proposal bears a close analogy to what a previous letter by me recommended; and if it be acted upon information might be obtained which would be likely to prove extremely useful in determining what grasses that your island affords would prove most economically useful for the purposes the Syndicate has in view.

Only this week a conversation was had by me with a gentleman well versed in tramway engineering relative to the best methods for working any system of tramways which may eventually be adopted in your larger cities and towns. On my mentioning electricity as offering to my mind the best method, he remarked:—"Perhaps you may not be aware of a very serious difficulty which has lately been discovered as to this course. It is found that unless a very heavy expense is gone to for the insulation of tramway lines, probably £1,000 a mile—the earth in the neighbourhood of such electrically-worked lines becomes polarized over a large area, and no telephone wires or any other telegraphic system using the earth for return currents can be worked. Experiments have shown that this polarization of the ground in the vicinity of strong currents such as those used for electric propulsion extends to almost an unknown distance, and in America there has been a complete stoppage resulting to the working of some of the ocean cables. This is a matter which is likely to disincline Governments to sanction electric tramways, especially in cases when the telegraph or telephone is their property." As we hope Colombo is not to be left much longer without its local tramway system, one which would prove of great service to the residents in a place covering so large an area as your capital city does, it will be as well that this recently discovered objection to the use of electricity upon them should be known and be well-considered when the question of the means of working them is being discussed. —*London Cor.*

COFFEE IN JAVA.—The opening statement by the Minister of the Colonies to the States-General in Holland is not so cheerful about Netherlands India as could be hoped. The serious failure in the yield of coffee is at the root of all trouble, and will cause a serious deficit in the Government accounts, reckoned at twenty millions of guilders. Nor is the loss only confined to the Government, for the commercial community and the natives feel the situation. It is satisfactory to note that the Government will not have to borrow, however, and that irrigation works and the extension of railways will not be thrown back. They are both to be proceeded with.—*L. and C. Express.*

WET AND DRY.—The Style district of Cumberland is the rainiest in the kingdom, and the Dingwall district of Ross shire the driest. 175 inches a year is the mean fall in the one place; 14·57 is the mean in the other.—*Rod and Gun.* [This statement surprises us; for we had seen it stated that the records of over half-a-century showed that the highest average annual fall of rain was 117 inches on the Cumberland range and that the lowest fall was in Durham, not more than 20 miles due East of the scene of the maximum, and was about 17 inches—ED. *T. A.*]

DISCOLORATION AND OTHER AFFECTIONS OF TEA LEAVES.—It is natural after their experience of coffee that Ceylon planters should be particularly sensitive about any evil appearance in their tea leaves especially when such may recur after an interval and perhaps in the same locality. We hear of nothing of the kind generally, but every now and then we have an inquiry about discolored or punctured leaves which are puzzling to account for and which may look like the beginning of a minor pest. It is, therefore, satisfactory to be able to publish the following letter from the Director of the Royal Botanic Gardens in answer to one such inquiry by a planter living at a medium elevation. Dr. Trimen writes to our friend:—

Peradeniya, Oct. 2nd.

Dear Sir,—In reply to your letter of yesterday, I may say at once that I do not think there is anything seriously the matter with your tea. Such little patches, spots or pimples of unhealthy or dead tissue are very common on nearly all leaves of an evergreen character especially when of some age, and are quite compatible with the good general health of the plant, as they do not materially interfere with the functions of the leaves as a whole.

I notice that the younger leaves you send are scarcely at all affected.

What may be the actual *cause* of the local affection of the leaves I am not able to say, probably some irritation from the presence of minute insects, the scorching of sun after rain, &c.

The condition is, I think, scarcely of sufficient importance to warrant the name of "disease," though such a term is technically justifiable.—Yours faithfully,

HENRY TRIMEN.

THE CHARACTERISTIC INTEMPERANCE OF THE INDIAN CLIMATE—says the *Pioneer* of the 16th ult.,—has been carried so far during the present rainy season that the weather reports land us in the region of paradox. It is the standing objection to India that for eight and a half months in the year it is far too dry, and for the remainder far too wet: but during the present season an unusually large rainfall has been compressed into little more than two months, and complaints of droughts are abroad before the monsoon in the ordinary course should be nearly over. Districts showing far more than the whole of their average annual allowance of rain are already crying out that unless more comes there will be no autumn crops. Districts that were mostly under water in the middle of August are by the middle of September complaining that it will be impossible to sow. Within a month the tone of the Provincial Summary has changed from "a break urgently needed" to "rain urgently needed," and that through every district. The next few days will show how far this urgency has been met by the showers which have come in the nick of time to the Allahabad Division. But Lower Bengal, still more unfortunate, is suffering simultaneously from the effect of both extremes. Through the Burdwan and Chota Nagpur Divisions the winter rice crop is said to be suffering badly from drought, while in other parts of the Province both autumn and winter rice have been apparently destroyed by floods. In Murshidabad, Jessore and Nuddea the damage from this cause is so severe that relief has already become necessary.

PLANTAIN GROWTH AND PLANTAIN FOOD IN AFRICA

are noticed by a writer of reminiscences in the *Pioneer*. Writing of Uganda, he states:—It is a marvellous country in many respects, full of rivulets, banana groves, clustering hamlets and wild fig trees. Whether one approaches it by way of the Nile or from the East Coast route, it is like stepping into a new world to set foot in Uganda, so totally different is it to anything one has met with before. Perhaps the most striking feature to a new-comer is the immense number and size of the plantain trees, which grow in such profusion that he may walk for miles with nothing but the shade of their broad leaves above his head, and nothing to be seen on either side but long vistas of their stems. In one sense this luxuriant growth of plantains may be said to be the curse of the country, for since the Waganda find their food so easily (literally bending down for their acceptance), they never take the trouble to cultivate the soil or to sow cereals, but live in lazy idleness upon the provision so bountifully supplied by Nature. The plantain trees grow to a large size in that humid climate, compared to which those met with in India seem a most degenerate species, the bunch of ripe fruit being as much as a strong man can lift. There were four or five distinct kinds: the ordinary eating banana; a second kind with a very thick pink stem and long three cornered fruit called "gonja," which they always cooked in hot ashes, when it resembled a roasted apple in flavour; a third species which bore very small fruit, in taste not unlike jargonelle pears, from which the national drink mwengi was made, and another kind which is never allowed to ripen but invariably cooked in its green stage. This last was the "staff of life" to the Waganda, and as long experience had made them connoisseurs in the art of cooking it, it may prove interesting to describe the operation briefly.

A bunch of fruit is selected whose colour is just commencing to change from green to a tinge of yellow, and the tree from which it hangs is cut down at the root. All the larger and more perfect leaves are then cut off and passed rapidly through the flame of some burning straw or other dry combustible, the centre rib of the leaf being first split up with a knife along its whole length to serve as string afterwards. The action of this flame renders the leaf soft and pliable without injuring its strength and a number of the plantains, carefully peeled and cleaned are then tied up in some of the best and most perfect leaves, the bundle being placed in a large open-mouthed earthenware pot with several pieces of the thick leaf stalk underneath to prevent the bundle touching the bottom of the vessel. About a pint of water is then poured in and a quick fire started underneath, the bundle of plantains being carefully covered over with layer upon layer of the flexible leaves neatly folded up, which both prevent the escape of steam during the process of cooking and serve the purpose of a table-cloth afterwards. If they have meat it is wrapped up in a similar manner, great care being taken that the leaf wrapper has no crack through which the gravy can escape, and deposited in the very centre of the plantain bundle: a rude and perfect imitation (or original?) of Captain Warren's cooking-pot. When the women judge that the steaming has continued for a sufficient length of time, the top layers of folded leaves are removed from the pot and spread out upon the rush floor: and a most aromatic appetising odour does that smoking table-cloth emit, as I can testify from experience. Then the great bundle of plantains is extracted and kneaded by the women while still wrapped in leaves, until the mass is of the consistency of mashed potatoes, when the leaf coverings are untied and portions handed round to every guest. The smaller bundle of meat is placed in the centre of the cloth, and each one helps himself to gravy by pressing his thumb into a small ball of plantain mash so as to make a kind of cup, which he dips into the liquid.

A more appetising way of cooking plantains could hardly have been devised, and it is small wonder that the Waganda thought no food could compare with it. In fact they openly asserted that the reason why white men visited their country was because no such trees grew in their own. To them the plantain tree means so much that they entertain an undisguised pity for those whose lot is cast in a country where it does not flourish. It not only supplies them with their daily bread, but gives them ropes to fasten up their fences, napkins to wash and wipe their hands with, dried provisions to take with them on their journeys, and a delicious beverage to drink which is fully equal to cider. The only purpose for which they grow cereals is to start fermentation in this mwengi or country beer, and when the ambassadors were returning from Khartoum they were constantly longing for plantain food, although liberally supplied with wheat, rice, meat and vegetables. Of the merit or demerits of this natural food supply it is difficult to judge. It evidently suited the Waganda, for they were physically well formed and surprisingly intelligent; but we noticed that they required to eat an enormous quantity of the food to extract the due amount of nourishment, and one result of this was that most of the children (between the ages of four and twelve) were more or less pearshaped about the abdomen. It is very doubtful whether Europeans could subsist for any length of time on such a diet, as the power of assimilating it could probably only be acquired when young: but it only needs the demand for cereals to be created for the supply to be forthcoming, as the soil is rich enough for anything.

THE NORTH BORNEO PEARL FISHERIES.

Several letters having been received lately at Sandakan on the subject of Pearl Fishing on the Bernoo coast, the Government have forwarded to the *West Australian* a copy of a letter sent to Messrs. Erickson and Wood, in June, 1888. Information was asked for on their behalf by Capt. Gray, of the "Australind." The following are the chief parts of the letter, and the Government offers to give any further information desired, adding, however, that a permit would not be allowed to interfere with a bank known to and worked by natives.

PEARL SHELLS.—Mother-o'-pearl are found around the coast and island of North Borneo, particularly in the Sulu Seas, where they are fished for by natives in the most primitive way. The shells form one of the most important exports in the Sulu Islands. From time to time pearl banks have been found round Balambangan, Bangney and Malliwalle, and round the Islands of Culibabang Paya and Omadal on the East coast, all included in the territory called British North Borneo, but as yet nothing has been done to discover or develop them, the attention of the Government having been given to opening up the country. The natives of the coast, however, are beginning to give more attention to pearl-shell fishing, and within the past two years pearl-shells have been exported from Darvel Bay. A bank is also known to exist in Marnda Bay. The reason why pearl-fishing in North Borneo has not received more attention, is on account of the reports about pirates; up to within a few years ago the coast was infested with them. The Batuinis, Illamins, and Bajows were at one time very successful in keep-

ing the coast to themselves. Since the advent of the British North Borneo Company, however, these marauders have had to retire or become peaceful subjects, or suffer the penalty of their misdeeds. At the present moment there is not a pirate in our coast, trade is entirely free, and the Company is entirely free to open up and develop industries on land or by sea. Regarding pearling (I refer to mother o'pearl). Government are prepared to give encouragement and special advantages to pioneers in those industries.

PERMITS AND LICENSES.—A permit or license would be required from the Government, the fee for which would be nominal: a monopoly for a certain time would be granted to the discoverer of new pearl banks.

RULES AND REGULATIONS.—We have no rules or regulations in force, but in the event of the pearl fishing becoming important, rules and regulations such as are in force in Australia would probably be adopted, with the modification necessary to such circumstances.

TARIFF OF IMPORTS AND EXPORTS.—With this letter I am sending you a copy of the *Herald*, official gazette for March, which contains these, together with Harbour, Custom and Quarantine Regulations. It will be observed that the export duty on mother-o'-pearl-shell is 10 per cent. ad valorem. The advalorem duty is calculated on the local value.—*Singapore Free Press*

CEYLON UPCOUNTRY PLANTING REPORT.

Practical Information on "Nutmegs."

NUTMEG CULTURE—MANURING NUTMEGS—NUTMEGS *vs.* CACAO—MODE OF CULTIVATION IN THE LOWCOUNTRY AND ON THE HILLS—YIELD OF HALF-AN-ACRE—INCOME FROM A SINGLE NUTMEG TREE—PRICES IN LONDON FOR NUTMEGS AND MACE.

Oct. 6th.

Periodically, with longer or shorter distances of time between, there is a rage for nutmeg culture in Ceylon. The last "boom" was some six or seven years ago, and there is another "boom" on again. People can get very enthusiastic about the nutmeg, especially during the initial stages; and, having no certain data to go on as to what might be expected in the way of returns, hazard wild enough guesses, touching in some cases, as it did the other day, the munificent figure of R50 a tree! But the man who would grow the nutmeg must be a man with a good stock of patience; and as Europeans in Ceylon are, as a rule, impatient for returns, they are not all suited for the cultivation of this spice. Hence it is that the regularly recurring nutmeg excitement burns itself out long before the tree has had any chance of showing what it really can do; and the plants which had been put out amid great expectations are, after a longer or shorter time thought nothing of and perish from neglect. I can remember of one man who even forestalled this: so disgusted was he with the slow growth of the young plants that he put an end to their existence and his own hopes by pulling—what he called—"the wretched things" up, and closed his experiment in that violent way. Those who know the nutmeg are too well aware that it is not likely to overgrow itself, or hurry into bearing, and the pauses between each recurring pair of new leaves are trying even to a patient spirit. The grower in the old days was afraid to stimulate the plant in any way:—"Manure it, and it dies," was the scientific dictum, believed in and acted up to; and the young nutmeg was left to pick up what nourishment it could from an already worn-out soil. The failure of the nutmegs in the Straits—brought about we were told by high manuring—was what paralysed anything like culture here.

We are getting over this, and the successful experiment in the lowcountry—which is the result of an intelligent patience, and manure applied from the first year of the nutmeg's life—is likely to inaugurate a new era in the production of this valuable spice in Ceylon, and add to the tropical products which the planter may successfully grow, and on which he may depend. We have learnt that the dying out in the Straits was much more likely to have been the effect of the cutting down of the shade and forcing the trees to overbear than the fact that they were well-manured. Even although no special cause can with certainty be assigned for the catastrophe, it must always be remembered that a wave of blight is liable to pass over any product which is extensively cultivated and artificially forced, and that the nutmeg has not been an exception to this rule. It is the waiting for returns which staggers most people, but if one considers how long a cacao plant takes before it is in full bearing—the supplies got up, and everything else in order—the extension of time which the nutmeg demands dwindles into very little. One cacao planter whose place is a credit and has been for a long time in the front rank, told me that it was nearly ten years before his estate had been what he called complete, and the vacancies regularly filled up.

The culture of the nutmeg in the lowcountry differs somewhat from those on the hills, in this way: that in the warm, sweaty, low elevations, shade is demanded. One who has now a good show of nutmegs in a low place, and has given much thought and attention to the growing of the spice, gives me (for the benefit of others who may yet try) the following as the outcome of his experience:—"The plants should be raised from selected seed in nursery beds, and planted out when about one foot high, with a 15-inch 'Scowen's Transplanter,' into holes cut 2 feet deep, and at distances of 25 to 30 feet. They must be at once carefully shaded with cadjans or other suitable shade, and this must be renewed, whenever necessary, until the young nutmegs are about three years old, and the permanent shade trees (*Albizzia molluccana*) sufficiently well grown to shade the ground. The young nutmegs must be kept free from moss and any parasites. Manuring should be commenced when the plants are one year old—the manure spread on the surface and lightly worked in without injuring the under rootlets. When the trees are five or six years old they will blossom, but they will not set fruit until the seventh year and will afterwards yearly increase in production." On the hills the nutmeg wants shade at first but not afterwards; and if the seed is germinated it can be put out after having been duly protected, with a fair prospect of success. To have any kind of decent show of nutmegs one must keep pegging at it, and not count the losses of seed and plants as anything very serious. As to the nutmeg paying, I am in a position to give some figures which may be relied on and which are a rough average of something like fifteen years' returns. The nutmeg grove is a small one, about half-an-acre in extent, contains 58 trees of which 36 are bearers and 22 are males. The trees are planted about 18 ft. apart and are crowding and crushing each other, and the shade below is so dense that no weeds whatever can grow. The trees, I fancy, must be from 35 to 40 years old. The produce from this grove was sold locally, and for the time I refer to, the nutmegs fetched in their *shell* at the rate of 37½ to 50 cents a lb., and the mace R1 a lb. on the spot. The price today is very much better, R1 a hundred for the nuts and R1·25 per lb. for mace, while selected nuts for seed are R2 a 100. It takes from 50 to 80 nutmegs with their shell, on—I don't mean the husk—to make up a pound. The produce of the above half-acre has averaged for these fifteen years about R100, that

is to say, R200 an acre. The cost of cultivation, except keeping down parasites, had been nothing: the crop only had to be gathered. The proportion of male trees is, of course, very excessive; and in a regularly planted place the excess of males would have been wiped out and fresh plants put in. I regret I am not able to get the proportions received from nutmegs and from mace separately, otherwise it would have been a simple matter to have calculated the average yield of each. But the information given above, so far as it goes, is thoroughly reliable.

Here there is nothing so handsome as R50 which has been mentioned to be the income that may be derived from a single nutmeg tree, but, nevertheless, the prospects ahead of the successful nutmeg cultivator are such as to class it among the most profitable tropical cultivations in which one can engage.

The price in the London market for nutmegs and mace is very much higher than obtains here. I have, however, no late circular at hand to quote the figures. Perhaps Mr. Editor, you will kindly supply them. PEPPERCORN.

[We quote from Messrs. Lewis & Peat's fortnightly Circular, Sept. 11th :—

	QUALITY.	QUOTATIONS. 1890.
NUTMEGS, large	...57's a 80's, garbled...	2s 10d to 4s
medium	...83's a 95's ...	2s 8d to 2s 9d
small	...100's a 160's ...	1s 6d to 2s 7½d

—ED. *T. A.*]

A LONDON TEA WAREHOUSE.

(From *Chambers's Journal.*)

It is 8 o'clock of the morning and a numerous body of workmen are passing into the doorway of a huge barrack-like building some half-dozen stories high, occupying the site of a considerable village of London houses which have been swept away to build it. In quiet orderly fashion the morning muster-roll of labour is accomplished, and the gangs of men are told off for work. Steady and well-mannered fellows mostly, but not much resembling ordinary labourers, as currently understood, are these warehouse hands. A most varied lot certainly, with a very general appearance, for the greater part, of artisans out of work, or "down on their luck," as they would say. Indeed, many of them look like anything that could be named in a wide range of choice, not excluding the liberal professions and the gentleman "born."

HOW TEA IS LANDED.

The great ocean steamers are berthed at the various docks as soon as they arrive in the Thames. Their cargoes are discharged at the principal docks, and immediately dispersed over the port of London in vans by land and barges by water, all of which conveyances are jealously crown-locked by the sleepless Customs officials, who watch this fruitful source of revenue from the first "hail" at Gravesend until it is finally deposited, duly paid, in the hands of the consumer. But, primarily, its destination, on being sent from the ship's is the bonded warehouse in town or by river-side, where the warehouse-keeper gives ample security for its safe keeping, alike to the owners thereof and to the Crown as having a lieu on the goods at first hand.

SORTING.

On arrival at the warehouse the tea is pounced upon by gangs of the handy and civil labourers; and, anon, the chests are whirling in mid-air on their way to loop-holes of distant floors near the sky-line, or are being transported thither on men's shoulders in endless streams like human ants, up bewildering flights of stairs to similar far-off stowage. Other gangs, *ad infinitum*, there receive them. Squads of coopers hammer them, prune and hoop them, and otherwise amend them. Drawers of samples pierce and tap them Expert hands carefully assort the multifarious packages into "chop" and "bed," with nice regard to size, quality marks, garden marks—delightfully suggestive these of orient tea-fields—and uniform weight and description. The tea-chests are then ready for the weighing scales, at which Customs officers and warehouse clerks busily ply their pens, entering into account-books the gross and net weights of the goods by each ship, in successive importations, as the packages, are past in swift review before them. Odd things come to light sometimes when the chests are emptied to be weighed for tare and refilled. "Unconsidered trifles" from far-off homes in Assam are occasionally revealed. White rats, dead and flat, have been seen, and bogus chests are not unknown. A frequent importation by the China tea-ships is the delicious fruit lychees in a dried condition.

A CHECK ON ADULTERATION.

But to return to tea. In the history of its progress up to the weighing-point the rigid scrutiny of the revenue officers has been exercised mainly with a view to fiscal and statistical returns; but at this stage of the proceedings the various teas—Kaisons, Capers, Congous, Pekoes, Souchongs, Oolongs, Assams, Hysons, &c.—are inspected by an officer acting as an official analyst under "The Sale of Food and Drugs Act 1875," who selects samples and subjects them to a searching examination, with at times, the wholesome result that spurious or adulterated teas are prevented from entering the British market; and even to the extent of causing such vitiated goods to enter the destruction furnace instead. Large quantities of damaged tea are disposed of in that manner.

A DELECTABLE MIXTURE.

Tea is frequently spoilt on the voyage by salt water or other causes, and, being thus rendered unfit for human food, it becomes "prohibited." It is, however, allowed to be delivered duty-free from the warehouse on condition of its being denaturalised by the effective process of mixing with it a proportion of asafœtida and lime. This delectable compound is used in the manufacture of the alkaloid caffeine.

"BULKING."

For home use the tea from China is generally cleared out of bond in the same condition as on arrival in this country. But Indian tea appears to be so much varied in quality and "make," even when produced in the same tea province, or district that it is found necessary very frequently to throw it together in quantities, taking care not to blend different marks and importations. This arrangement is termed "bulking," and the effect of it is to make the whole bulk of the tea operated on more uniform in appearance and quality. In a large tea warehouse capable of holding perhaps a quarter of a million packages, amounting, it might be, to twenty-five million pounds of tea, the bulking of Indian produce assumed stupendous proportions. Floor after floor will at a busy time be crowded with enormous heaps of the emptied contents of many hundreds of chests. These fragrant mounds are thoroughly "roused" by gangs of men, deft-hand varlets with wooden shovels. A faint and balmy odour fills the rooms, and the atmosphere is heavily charged with a very palpable dust of tea, of dull red hue, which settles upon the clothes like down. The bulked tea is refilled into the original chests and again weighed in the presence of the Crown officers, each empty chest having been previously weighed for tare; the merchant paying duty on the exactly ascertained net weight of the tea.

TEA EXPORTED FROM LONDON.

Immense quantities of tea are annually exported from London, noticeably to Germany and the Baltic Provinces. It is also largely sent to the colonies and to South America. The latter trade is peculiar, the tea being prepared in bond expressly to meet certain native demand. Packets as small as four, or even two, ounces are greatly in vogue. Those goods are frequently also weighed in French kilogrammes (2lb 3oz 5dr.)

Great attention is paid to careful packing for the voyage, and subsequent inland transit; and to elegance of design and pictorial display as to the wrappings and labels embellishing the packets and setting forth the attractive charms of the various judicious blends and mixings. In this particular branch of the trade much latitude is given under the revenue regulations, in bond, as to blending and mixing—practices not allowed to the home trade.

COMPRESSED TEA.

Compressed tea is also occasionally exported from a bonded warehouse. This is tea pressed into brick or cake shape—indubitably tea-cakes! The operation is performed by powerful machinery moving a massive metal disc, which is pierced at regular intervals with oblong holes. Into these moulds the loose tea is poured; and as the iron table slowly revolves, each small parcel is treated in turn to enormous dry pressure from a steel mallet, which infallibly meets the mould with accurate and terrific accord, and squeezes the tea into a solid and shapely lump. In these latter arrangements female labour is greatly employed; the various packing and other arts connected with the system requiring much quick handling of goods and delicate manual skill.

Tea is sold in bond to the dealers by samples which are daily on show; and it is needless to say that the moment the chests leave the warehouse the price paid is enhanced by the fourpence per pound which goes to swell the annual Budget of Her Majesty's Chancellor of the Exchequer. Subsequently, the value is not easily determined. Indeed, it might be said, ethically at least, that it is priceless.

MR. MAXWELL ON COCONUT BEETLES.

The Resident of Selangor issues the following notification about what he calls cocoa-nut trees; but probably he means coco-nut trees:—

No. 185.—THE COCOANUT-TREE BORER (BEETLE)—Districts Officers are instructed to use their influence with the native owners of cocoanut plantations in order to induce them to clean their trees periodically and rid them of beetles. The palms should be ascended once every month or six weeks. The lowest leaves, if shewing signs of drying up, should be chopped off and the trunk cleared of any old leaf-stumps and of ants'-nests, etc., which the latter may have harboured. At the same time the top shoot should be carefully examined. If they are of a yellowish, sickly colour the beetle is probably the cause. There is no difficulty in finding the hole, as an accumulation of short loose fibre marks the spot. This fibre should be removed and a wooden or metal probe pushed into the hole (one of the side-ribs separated from a frond will answer the purpose.) The beetle is soon transfixed and pulled out. A little sand should be thrown into the hole.

The above is the system employed on the Malabar Coast where the removal of beetle is one of the ordinary routine operations of the cocoanut-growers. A single toddy-drawer will there clean from fifty to one hundred full-grown trees in a day.

The insertion of a little kerosine oil into the hole may be usefully tried. Kerosine oil if mixed with an equal proportion of milk forms an emulsion which can then be diluted with water to any desired extent —*Straits Times.*

CEYLON TEA IN AMERICA:

MR. GRINLINTON'S MISSION AND THE NEW COMPANY.

We have been favoured with the use for publication of the following letter from Mr. Grinlinton to his colleague, Mr. Mitchell:—

S. S. "City of New York," on passage from New York to Liverpool, 491 miles from Queenstown, 22nd September (noon) 1890.

My dear Mitchell,—I last wrote to you on 12th instant from New York, I had at that time accomplished 2,160 miles by rail and had visited Baltimore, Cumberland, Chicago, Bloomington (in the West), and paid flying visits to Philadelphia, Detroit, Buffalo, Niagara, Southampton, 90 miles from New York) and some other places, having made tea, written on tea and on Ceylon products, given private lectures, been interviewed by newspaper correspondents and editors till I was fairly worn out; and some of my relatives who travelled with me (I was always accompanied by some one or more of them) feared I would break down, but I did not, and I am on my way to the mother country as fresh as ever I was, only a little tired, as if I required sleep.

I found the American people most kind and courteous and ever ready to help me, and having been well introduced in every place I could not have been better received. Members of my family, first and second cousins as well as others nearer akin came from all parts (hundreds of miles) to meet me, and I was simply delighted with the country and its people which I saw under the most favourable circumstances. I heard the English language spoken by everyone, and on Sundays I heard our English services in the churches and I felt that I was not in a strange land, but as a visitor to a distant part of our own country. I heard our beloved Queen, our constitution and system of Government spoken of in the highest terms, and the good feeling entertained for the mother country made me feel almost ashamed of the opinions I had at one time entertaned of our American cousins.

Now to business. It took some 8 to 10 days to draw up the needful deeds and papers with a prospectus of the New American Company. After we had settled on all the points, and while the formal clerical work was being attended by the lawyers, I travelled and made our Ceylon products known in many places, so much so that I have been urged to press on our friends in Ceylon to have our little island well represented at the Chicago Exhibition of 1892 and we shall get a good position in the Exhibition I feel sure. Men of business and many others to whom I spoke took a lively interest in our interesting and beautiful island and promised me every help.

On my return to New York on the 11th instant, I had a paper put into my hand which caused me considerable anxiety, as it contained statements which I felt bound to investigate thoroughly, before I could ratify officially what I had agreed to on my arrival. It took me two days to call upon men of business to whom I had taken introductions from Ceylon and from London to obtain their aid in making my enquiries. I left no stone unturned that I could think of, and having consulted some of the best men of the city, I was more than satisfied that the fears entertained by well-intentioned friends who were so good as to place me on my guard were perfectly groundless. One gentleman, to whom special allusion was made by name, came out of the enquiry with flying colours, and what promised to be an ugly blot has proved of service to us in more ways than one. To Messrs. Wattson & Farr I owe a debt of gratitude for having placed everything at my disposal. To all my proposals which were discussed with the new Board and with the Company's solicitor, they gave due weight, and I had the satisfaction of seeing all the important points carried,—more particularly that in respect to the purchase and sale of pure Ceylon tea; the payment out of the funds, before transferring the balance, of interest at 9 per cent from the date of their payments to 30th September (instant) to the old Company's shareholders who continue in the new Company; the continuation of our Ceylon Directors as a Board of Management in Ceylon; the appointment of our Agents and Brokers for the purchase of teas both in Ceylon and in London.

The old shareholders receive two shares for every one held now.

The legal documents have gone to our agents in London to be handed to me there and I take duplicates with me.

The share scrip has been engraved and is being printed.

The prospectus is being printed and will be advertised probably by this time.

Nothing had been done except the formal registration (which I read with care and approved of) until I arrived at New York, and had the Company not gone on, those signing the memorandum would simply have lost the Registration fees. I think I have now mentioned the principal matters. There are many minor points which I shall reserve for another time. It is no easy matter for a landsman to write in a ship going 20 miles an hour and rolling.

I wired you from New York on 15th inst. to the following purpor :—"Letter derogatory New York parties sent Ceylon. There is no foundation for the report. We have made careful enquiry and the result satisfactory. Sailing 17th. Everything settled and papers signed." My remarks above are in explanation of this telegram.

It is with great pleasure I mention the name of Mr. Pineo, whose exertions are beyond all I expected. He has been unremitting in his endeavours to place Ceylon tea. Everyone speaks of him as the right man to be placed at New York, and many people have mentioned him to me as most obliging and attentive to everyone seeking information. Consequent on the new start given to matters in America and to Mr. Pineo's exertions, large orders with credits to enable you to draw in cash for the shipments have been sent you. Mr. Pineo has been of the greatest assistance to me, and I feel assured that no one could have shown more zeal in pushing our largest Ceylon industry in the new world. It is only common justice to say this of Mr. Pineo.

We have no idea in Ceylon of the efforts needed in such a vast country as America to push an industry like our Ceylon tea. Our little paid-up capital (some R80,000) would have disappeared within the next 12 months. The movement now on foot is to obtain shareholders everywhere—in every city, town and large village; and to do this Messrs. Wattson & Farr will have to distribute a vast number of shares by giving such shareholders as *will work for the Company*, in placing Ceylon tea in the several towns and villages, an additional share for every share they take and pay for. Very large sums will also have to be paid for advertisements, &c. Not a cent is to go into the pocket of any men out of the capital raised in cash, nor for any purpose until the *whole* of the *cash* capital (200,000 dollars) has been raised and placed in the Treasury. A bond has been executed between the New York Directors to this effect.

You will be glad to hear that I have met Mr. Lipton first at Chicago and secondly at New York, and I am greatly indebted to him for kindness and attention and for the valuable hints and information given me. I cannot write too highly of all he did for me. He took a personal interest in everything. It is quite wonderful what he is doing in Chicago. I saw a property which he had just purchased for *200,000* dollars and had paid for it in hard cash. He is a very wellknown man in New York and Chicago, and his command of capital enables him to make good purchases. I went over his cattle yard and packing warehouses.

We expect to arrive at Queenstown at 1 p.m. tomorrow, and at Liverpool at 7 on the morning of the 24th. We are having a race with the Star Liner "Teutonic" which left New York half-an-hour after us. The two vessels kept in sight for 2 days and were then lost in a fog. We think we see the smoke from her funnels now, but we are not sure. It is most exciting. The "City of New York" beat the "Teutonic" on her last voyage home by 2¼ hours—but the "Teutonic" was first in on the last outward voyage to New York by 3 hours. This present voyage will pull the thing off, and whoever wins will carry the American Mails next time. The "City of New York" is a splendid ship of 10,500 tons gross. Her accommodation is simply magnificent, with a flush deck throughout. She is just a floating palace.

I must now close; and with all good wishes from yours sincerely, J. J. Grinlinton.

P. S.—I hope to leave London about the 16th Oct. via France and Italy for Naples and to embark there on 25th October on the "Khedive" for Ceylon. I can hardly write, the vessel is rolling heavily. I have backed our opinion (*i. e.* yours and mine) by taking £200 sterling worth of new shares for each of us in the New American Tea Company. You will recollect that you authorized me to do for you whatever I was prepared to do for myself. I hope some of our Company's Directors in Ceylon will take some new shares; also many of our old shareholders. I omitted to mention that when at New York Mr. Wattson (who was at Philadelphia) spoke to me direct through the telephone to Messrs. Wattson & Farr's office, a distance of 100 miles, so distinctly that his voice was clear and he heard my reply equally distinctly.—J. J. G.

TOBACCO IN DELI (SUMATRA), AND CEYLON.

The S. S. "Peshawur" has brought us a visitor in Mr. Chas. Kitchin, Tobacco planter of Deli, who has come across to see what prospect there may be of taking up or extending the cultivation in Ceylon. Naturally, Mr. Kitchin wished to know about the land in the Eastern Province, but he considers a country liable to protracted drought as useless for his purpose; nor does he believe in irrigation for a European's plantation. The expense over a considerable area would be prohibitory, and yet the margin for expenditure is very great. For, in answer to our mention of the lucky hit made in Dumbara when R800 an acre return from 50 acres was got in one year, Mr. Kitchin remarked that two or three times that amount is not uncommonly got in Sumatra. Of course, there are good and bad estates there—some wonderfully profitable up to 150 per cent per annum and some barely paying their way. This year has been a very profitable one through the high prices paid in Amsterdam, and also for Deli tobacco to go to America where its fine quality is greatly appreciated. Manilla has been, in this respect, quite superseded by Sumatra.—Mr. Kitchin considers it very important that fine tobacco should be guarded from deterioration. He thinks that a great drawback to Europeans opening plantations in India is the great inferiority and yet abundance of the native tobacco. But the cheapness of labour here and in India is an immense advantage over Sumatra where sometimes R20,000 are spent in trying to secure 100 labourers. Mr. Kitchin is to run upcountry: he will probably visit Matale and Dumbara and we bespeak for him planting attention during his visit to the districts.

COLONIAL-GROWN TOBACCO COMPETITION.

The following is the report of the Judges in the Tobacco Prize Competition:—

In making their award the judges have had a due regard to the conditions under which the prize was originally offered by the Section, the principal of which were (1) that specimens submitted for competition should amount to not less than 400 lb. in weight, grown on a commercial scale; (2) that each sample should consist of an average of the growth; (3) that the name of the grower, the locality, and total quantity of the growth should be stated; (4) and that the care bestowed on the handling, sorting, and packing of the tobacco for commercial purposes, should be taken into consideration. With the consent of the Section the competition was kept open more than two months beyond December 1, 1888—the date originally appointed for determining the same—in the hope that additional specimens would be forthcoming from the Colonies and India. The judges regret, however, that their anticipations were not

realised, and, consequently, they have only had to report on the three specimens from North Borneo, the West Indies, and the East Indies, which had been entered prior to the extension of time being granted.

These three entries were duly inspected by the judges on February 18th, 1889, at the Fenchurch Street warehouse, and their award was agreed upon; at a subsequent meeting after they had had an opportunity of comparing the merits of the North Borneo and West Indian tobacco—from which samples were drawn for manufacture into cigars. The East Indian tobacco, as stated below, was only suitable for cutting purposes, and hardly entered into competition with the others.

The judges much regret that through inadvertence a sample of East Indian tobacco, marked L B X and T F 782, was not brought under their notice; but they have added (Appendix B) a report by Messrs. Grant, Chambers and Co., of 37, Fenchurch Street, on its commercial qualities, which was drawn up some time subsequent to their inspection of the three exhibits mentioned in the foregoing paragraph.

Some difficulty was experienced by the judges in arriving at a decision, owing to the varying characteristics of the tobaccos submitted to them, and opinions being nearly equally balanced in favour of the West Indian and North Borneo specimens—which were comparable as cigar tobaccos—they decided to recommend to the Section that the prize of fifty guineas should be divided between the growers of the two specimens.

The judges are much indebted to Dr. Bell, of Somerset House, for his analysis of the specimens submitted to competition, which they append to this report.

Subjoined are particulars as to the cultivation and preparation furnished by the growers, and our remarks on the tobacco sent in for competition:

1. WEST INDIAN TOBACCO (445 lb.). Grown by Señor Nicanor Moreno, box 80, Kingston, Jamaica. This parcel, in two cases, was grown from Havana seed, on an estate at Airy Castle, St. Andrew, the total quantity of the crop being 2,500, lb., and the approximate yield per acre about 600 lb. The cost of production for the whole is stated at from 60s. to 80s. per 100 lb., and the grower explains that 'on account of dry weather the produce was not half of what it should have been.' The entry was made by Messrs. B. and J. B, Machado, of Kingston, Jamaica, who point out, with reference to the two cases, that the first contained about 200 lb. ratoon tobacco or second cut, viz., first and second fillers mixed, and that the second included about 245 lb. of first cut, mostly first and second wrappers. At the top of the latter, however, there were also about 50 lb. of fillers as a fair sample of the first cut. The method of assorting adopted, it was explained, was due to the fact that the tobacco was not intended for exportation, but only for use in Messrs. Machado's factory. These points were duly brought under the notice of the judges.

Remarks of the Judges.—In some important respects, this tobacco most fully complied with the conditions of the competition. Its general appearance was good, and it was of a uniformly dark brown colour. The leaves were fine and clear, there were some white veins, and about 18 per cent. of stalk. Viewed commercially, the tobacco was more suitable for fillers than for covers, the leaves being comparatively small, and consequently not very productive for wrapping purposes. The flavour was good, but too strong for the English market, and more suited for Continental consumption. The tobacco burned well, though slowly, and did not hold the fire as satisfactorily as the Borneo; but if matured it would improve in burning. For blending with Cuba, Brazilian and Havana, it was specially suitable. The samples submitted apparently embraced all the classifications in the crop, thereby satisfying the conditions of the competition. They possessed some resemblance to some sorts of Havana, and for certain qualities justified the opinion that parts of Jamaica are well adapted for raising the finer kinds of tobacco. In the Island of Cuba only some limited districts produce the more valuable descriptions, and similar selected places probably exist in other islands of the same group.

2. BRITISH NORTH BORNEO TOBACCO (533 lb.).—Grown by Mr. P. Persyn, Panow Estate of the Borneo Tabac Maatschappy Kudat, British North Borneo. This parcel, in three bales, was grown from Sumatra (Deli) seed on the Ranow Estate, the total quantity produced being 58,600 lb., and the approximate yield per acre 1,100 lb. The entry was made by the British North Borneo Company.

Remarks of the Judges.—Taking the three bales as a whole, the leaf naturally resembled Sumatra tobacco; the colour varied from medium brown to light brown, and there were some unripe spots; the veins were hard and wiry, but the leaf was thin, silky and tender. The proportion of stalk was about 16 per cent. Commercially considered this tobacco was the most valuable submitted to the judges, on account of its productiveness and suitability for cigar covers. According to one estimate, about one pound, if carefully worked, would be sufficient to cover about 450 middle-size cigars. Made up into cigars by itself, the flavour of the tobacco was pungent; neutralised by mixture with other tobacco, so as to overcome the Sumatra flavour, it would probably be better liked. Generally speaking, however, it lacked the rich aroma peculiar to the finer classes of West Indian tobacco. The burning qualities of the leaf were good, there being a clean ash, and cigars made from average samples kept alight for at least five minutes. The specimens submitted were part of a large consignment, and apparently did not represent all the classifications of the crop, and for this reason the judges have not been able to form an opinion on the merits of the entire growth.

3. EAST INDIAN TOBACCO (514 lb.).—Grown by the Superintendent of the Government Tobacco Farm, Ghazeepore, Bengal, of which Messrs. Begg, Sutherland and Co., of Cawnpore (Begg, Dunlop and Co., London), are the lessees. The sample weighed 1,133 lb., and it was one of 91 hogsheads shipped for sale to the United Kingdom, and not put up specially for the competition. The tobacco was raised from 'Pryor' seed, and about 60 tons were produced. Messrs. Geo. D. Wishart and Co., of Liverpool, who made the entry, believe the hogshead to be 'a fair representative sample' of the entire growth, and state that 'for some years past the produce has shown steady progression especially in the handling and curing. Only at the last minute did we decide to enter this competition, and we regret that we are unable to give any exact details as to the total quantity grown, or cost of production. The quantity shipped, however, shows that the tobacco is grown on a considerable scale, and that it has passed the experimental stage.'

Remarks of the Judges.—This tobacco was only suitable for cutting purposes, and of a common quality. The leaf was coarse, though bright, and the stalks large. Nevertheless, the strength of the leaf pointed to the capabilities of the soil on which it was grown for the cultivation of tobacco suitable for the pipe, provided there is a judicious selection of seed and the conditions of scientific culture are observed. The tobacco submitted resembled the lower American grades; in fact, with proper cultivation, it would be a good substitute for such kinds in the event of any stoppage in the supplies from the United States. It was estimated that in its then state the tobacco would be worth in the English market about 3d. per lb., and perhaps more to buyers requiring it, on account of its colour for blending with other varieties. The fact that during the American war large quantities of tobacco grown from American seed were imported from the East Indies should be some encouragement to growers there.

GENERAL OBSERVATIONS.

In conclusion we have to repeat our expression of regret that the prize offered by the Section has failed in its object to stimulate further attempts to develop a lucrative branch of production in the British colonies and possessions. This is the more to be regretted, because, in the great varieties of climate and

soil embraced in those localities—so many of them in sub-tropical situations favourable to growth of the finer descriptions of tobacco—there is an element of successful cultivation which has not been utilized, as yet, to any extent.

It might certainly have been expected that the offer of a prize for a competition of this kind could not fail to draw more attention to the possible capabilities of our dependencies in this direction. Every effort has been made since the conditions were decided upon to bring them under the notice of Colonial and Indian growers, and we are informed that numerous communications on the subject have passed between the London Chamber, Colonial Government representatives and individuals. Yet the result, as we have already pointed out, has been confined to three entries.

It can hardly be thought likely that in both hemispheres with few exceptions, the only places where fine tobacco can be grown are those inhabited by the Spanish race. We think it more reasonable to conclude that intelligently conducted trials would have led to the discovery in the British colonies and possessions equally well adapted for the purpose as any in the Spanish or Dutch possessions.

(Signed) WILLIAM HENRY WILLS,
(Chairman of Committee of Judges).

Appendix A.

ANALYSIS OF SAMPLES OF UNMANUFACTURED TOBACCO DRAWN FROM SPECIMENS SUBMITTED FOR COMPETITION.

			Moisture.	Ash in dried.
Borneo	A.	...	18·94	27·12
"	B.	...	19·65	22·45
"	C.	...	19·50	22·37
East Indian	D.	...	12·79	24·38
West Indian	E.	...	24·87	21·60
	F.	...	23·51	30·09
"	G.	...	20·67	21·67

ANALYSIS OF TOBACCOS ALREADY IN THE MARKET.

			Ash in Dry Tobacco.
Kentucky (common) ...		...	20·27
Connecticut (seed leaf)		...	25·74
Java (cutting)	...	...	28·06
German ...	...	...	25·97
Dutch (fillers)	...	...	22·12
Sumatra ...	...	...	20·44
Java (good) ...	...	...	21·95
" (common)	...	...	25·07
Seed leaf (fillers)	...	...	29·88

Appendix B.

EAST INDIAN TOBACCO.—Grown by Mr. H. Cain, Superintendent of the Government Tobacco Farm, Port Blair, Andaman Islands. The sample weighed about 514 lb. nett. the tobacco being raised from Virginia seed on the Government farm, and the total crop being 3,000 lb.

Report on one Hogshead of Tobacco.

EXAMINED FOR THE LONDON CHAMBER OF COMMERCE.

MANIFEST MK.	LANDING MK.
LB	No.
X	TF 782

Remarks.—Small part leafy, but rather narrow for the length, large part short and more or less blistered throughout, very imperfect, and with large bare stalks and butts attached. This tobacco in its present state has the general appearance of being only partially fermented, and will not hold fire, and has little or no flavour of tobacco. As a whole, it is not of such a character (in its present condition) to be an article that would meet a ready sale, except at an extremely low price.

GRANT, CHAMBERS & Co.,
37, Fenchurch Street.

London, November 15, 1889.
—*Tobacco.*

OUR REVIEWER.

ENGLISH VEGETABLES AND FLOWERS IN INDIA AND CEYLON*

Is the title of a very complete and valuable Manual, compiled from authentic sources by Donald McDonald. It is a square volume of 60 pages, good toned paper and clear type, and gives directions easy for an amateur to understand and to follow. In the introduction the writer shows how great the influence of Europeans in India has been in developing among the educated natives a taste for flowers and for gardening, and speaks of the help afforded through various Government Botanic Gardens, to those who are establishing a garden. The 1st chapter treats of "The Climates and Physical Features of India," and regards that land as having three distinct climates, those of Northern, Central and Southern India. The 2nd chapter is on "The Soils of India," the 3rd on "The Formation of the Garden," *giving* directions as to the slope, shape, preparation and drainage of beds, with quotations from various authorities. Then follows a very complete table showing "The proper months to sow and plant English vegetables in the Plains"; fifty-seven different vegetables are tabulated, and opposite to them we find the months marked when they should be sown on high and on low-lying lands. Next we have "Monthly reminders for cultivating English vegetables and flowers in the Plains." Thus we find "March in the Vegetable Garden," "March in the Flower Garden," and under each heading you have directions for Northern, Central and Southern India respectively. We will quote by way of illustration the directions for March in Southern India:—

"The great heat generally prevailing at this season prevents much sowing or planting being done, therefore pay attention to trenching, digging, and ridging up ground. In commencing to subsoil or trench a piece of ground, let an opening be formed, of two feet or twenty inches in breadth, to the full depth of the surface or active soil, and the entire length of the bed, and let the stuff be removed and left at the opposite side, in order to have it to fill up the last opening, when the ground or bed will have been entirely turned over. Let the subsoil, to the depth of a foot or fifteen inches, be loosened and well broken, with a pick or spade; but let none of it *now* be brought to the surface. A second trench must now be marked out, the same breadth as the first, and the surface sod of it turned over on the broken subsoil (upside down), and finished off in the form of a small ridge or drill. The subsoil in the second opening is now loosened and broken as the first, and a third line or opening marked out, the surface sod of which is turned over on the broken subsoil of the second, and finished off in the form of a drill, like the first, and so on to the end. The ground can be manured as the work is being carried on; but the manure should not be laid on the bottom nor on the surface, but in the middle of the drill, between the first and second spits, or between the digging and shovelling. Ridged up or drilled in this form, let it remain to pulverize, and there will be very little trouble in levelling it down for cropping in the proper season. At each succeeding digging a portion of the broken subsoil should be turned up and well incorporated with the surface soil: and by repeated digging, and taking up the subsoil in regulated proportions (not more than an inch or two of it at a time), the texture of the entire mass will be changed from a poor sterile, to a rich, fertile soil. This is the true method of deepening and enriching the soil, which, with effectual drainage, is certainly the best preparation to ensure good crops in the garden; and should be attentively studied and industriously persevered in."

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* To be obtained at the *Observer* Office. Price: cloth covers, cash R4·50, credit R5; in paper covers cash R2·50, credit R3; Postage 10c.

Then we have a table of "Average Seasons at various places." Next, a chapter on "English Vegetables, the best sorts to grow and quantities to sow." Concerning "Carrots," for instance, they tell you:—

"One ounce will sow a row 100 feet long and twelve inches apart; thin out to six inches from plant to plant. Mix the seed with moist sand the day before sowing. The best sorts are Early Summer Favorites, the new Scarlet Perfection, Intermediate, Early Horn, and White Belgian."

Or concerning Tomato:—

"One ounce will give about 800 plants. Sow in boxes, and transplant to three feet apart. As they mature, cut out all superfluous growth to expose the fruit to the sun. Such varieties as the Smooth Perfection, Dedham Favourite, Holborn Ruby, and Golden Gem, give marvellous returns of the most delicious fruits in most parts of India. The plants will require support unless against a fence or wall. A plan that might be tried with success in India is the placing of a piece of trellis shaped thus ∧ over the plants, push the growth through it, and let the flowers and fruit lay on the top. The foliage will assist in keeping the roots shaded and cool, while the fruit will get the full benefit of the sun. It is a great mistake to feed them too much at the earlier stages of growth. They will set their fruits more freely on pure water and good garden soil, if a start is given them in something richer, and repeated when the fruit is forming."

The remaining chapters are headed "Hill Stations, Garden Cultivation in Upper India; Notes on Ceylon; English Flowers from Seed; Popular English Flowers, including shrubs and other plants that do well in India; & Select List of Foliage Plants for subtropical gardening (all of which can be grown from seed); The Rose; English Bulbs; English Fruits; On Manures, Watering, Vermin, &c.; Average Rainfall at various places; English Seeds and how to treat them; Average Altitudes at which various trees grow in India; The Rotation of Crops in the Vegetable Garden (a table)."

The list of Popular English Flowers includes 113 names, and the descriptions run somewhat as follows:—

"COCKSCOMB.—A variety of the Celosia, ranging in colour from bright yellow to deep crimson. Sow in pots and transplant singly as soon as large enough to handle; repot as required, and keep the plant well fed, and with plenty of root room. The fine Empress variety produces combs of colossal proportions. The plumosa varieties can be bedded out.

"*Sow in the Hills, March to May*; *in the* plains everywhere, *June to September*."

INSECT PESTS AND REMEDY.

Although the following is properly an Advertisement, we quote it into the *Tropical Agriculturist*, as the information may be useful to our readers:—

CASPER SCHNEIDER'S ARSENITE OF AMMONIA. U. S. PATENT. PREVENTS DAMAGE OR DESTRUCTION TO COTTON PLANTS AND ALL OTHER CROPS OR DELICATE PLANTS BY INSECTS, &C.

Distinctly superior, more convenient and considerably cheaper than Paris Green.

Stapleton, N. Y., April 5, 1890.

Gentlemen.—On the 11th Day of February 1890, I obtained from the U. S. Patent Office a patent for a Substitute for Paris Green which I have named "Arsenite of Ammonia." It is designed for all those uses on the Plantation, Farm, and Garden to which Paris Green is now applied; and it has been adjudged decidedly superior to the latter article by farmers in all parts of the country who have tested in with the most satisfactory results. With their letters of commendation before me, I have no hesitation in introducing it to the public at large.

A few of the advantages I claim for Arsenite of Ammonia over Paris Green are as follows:—Being a fluid, it will raise no dust and is entirely free from sediment when dried out. It is particularly beneficial to Cotton Plants, but is also decidedly superior to Paris Green for use on fruit-trees, currant-bushes, grape vines, and general garden truck. Having no sediment it will not, like Paris Green, leave a deposit on the plants to which it is applied that will retard their growth. On the contrary, plants treated with this solution are of quicker growth and of decidedly improved appearance.

It will enter into every crevice of the plant—which cannot be said of Paris Green: at the same time it is not necessary to saturate the surrounding ground.

DIRECTIONS.—To an ordinary pailful of water take one large tablespoonful of the solution. Mix and apply with an ordinary Sprinkler, or hand pump, or even with a small broom. In the case of cabbage plants, care must be taken to apply the mixture before they close or form the head. As a general rule one application will be found sufficient to destroy all insects and germs.

In using large quantities it requires no more of the Arsenite of Ammonia than of Paris Green, that is to say, where one pound of Paris Green would be required, take one pound of my substitute and secure sure results.

The experience of those agriculturists who have put my invention to a practical test warrants me in claiming for it:

1st. That it is more convenient to use than Paris Green.

2nd. That its effects are more satisfactory.

3rd. That, unlike Paris Green, positively no injurious results can come from its proper use.

4th. That it is considerably cheaper.

With my fifty-five years' experience in this line I am known all over the world as a reliable Chemist and the oldest manufacturer of Paris Green in the Country. My goods have the reputation of being the best made anywhere. I know the danger of using Paris Green on Plants etc. for the destruction of insects and have been experimenting for years to find an article equally as effective but not so dangerous: and I am fully convinced that in offering to the Public my new invention Arsenite of Ammonia, I offer an article that is sure to give entire satisfaction to all who use it.

Hoping you will give the circular your kind attention.

I remain, yours very reseectfully,

CASPAR SCHNEIDER, Chemical Works.

Sole Agency: Fr. Jac. Andres, 25 Pearl Street, New York.

—Quotations on application.—

Prof. Charles Ripley of the U. S. Department of Agriculture writes:—

"If your mixture is valuable for the cotton worms, it will be also useful for many other insects."

He has instructed me to ship a Keg each to several agents of the Division of Entomology in U. S. who are now experimenting with it.

Arsenite of Ammonia has also been found useful on potato fields and other purposes, and the following are copies of letters received:

1. I have tasted your insecticide on my potato plants with very good results, as compared with Paris Green. A single application of your compound upon several rows of plants killed all the bugs in one night. Adjacent rows of plants were treated with Paris Green, and as the first application had no perceptible effect upon the plants, a second dose had to be applied, which had the effect of killing the bugs, but had a perceptible had effect on the plants; while your compound had a decidedly beneficial effect upon them.

2. I hereby thank you for the bottle of your Arsenite of Ammonia you gave me as an exterminator of potato bugs and other vermin; it has been the best remedy I have ever used.

3. I have used your Arsenite of Ammonia on my rosebushes according to your directions, and found that even half the quantity will be sufficient; it killed all the bugs almost instantly, I found them dead under the bushes.

Correspondence.

To the Editor.

TEA-DRYING—THE BLACKMAN SYSTEM.

Dear Sir,—I believe the "Blackman Air Propeller" has been introduced on one or two estates. Would the managers of such estates kindly favor your readers with their opinions of it and what alteration, if any, is required in an ordinary withering loft to work it successfully? S. A.

FURTHER INFORMATION WANTED ABOUT A NEW FOREST CLEARER.

Dear Sir,—The March number of the 9th vol. of the *Tropical Agriculturist* contains at page 642 an article headed "A New Forest Clearer." Does any of the numerous readers of the periodical know anything more about the invention, or is the whole simply a humbug? By all means the information is not taken from an American paper.

For any informations in the *T. A.* which may lead to know more about the matter, eventually to get at the composition will be very thankful one who is about to become on a large scale a forest clearer.—Yours truly, EUGENE KASSEL.

A PROLIFIC COTTON TREE.

P. W. Bungalow, Delmar Estate, Sept. 20th.

Dear Sir,—In one month—20th August to 17th Sept.—I collected from one tree 7 oz. cotton, the seed 15½ oz. There has been no rain for some time; the tree is not at all a fine tree. I had to cut a large piece about 3 feet off, it was so overweighted with pods, and had been neglected. I would like to know what quantity of oil can be got from 1 cwt. seed; also poonac, and their value and use.—Yours faithfully, JAMES ROBERTSON.

P.S.—The same cotton as I sent you—"kidney" or "Pernamtbuco"—I gave a good number of this seed to the Hon. J. Grinlinton. I would like to see a deal of information given about this sort, for I feel sure it is the proper kind for Ceylon, if some fresh seed could be imported. [We commend this letter to the special notice of the Secretaries to the Cotton Spinning Company.—Ed. *T. A.*]

LIBERIAN COFFEE &c. IN JAVA.

Pussellawa, September 23rd.

Dear Sir,—I send you a translation of the conclusion of what seems to me a very interesting amount of Liberian coffee in Java—where according to Mr. H. J. Wigman it is to play a conspicuous part. There is in the same number an article on the production of camphor in West India by Dr. M. Greshoff which I think worth publishing.—Yours truly, JOHN DENT YOUNG.

"*Liberian Coffee.*

"At the present time, the cultivation of Liberan coffee is being extended with great energy in the subdivision of Buitenzorg alone. Tehre has to my knowledge, already been an extent of over 3,000 acres those cultivated and there is still an immense extent of land in the lower districts, now lying waste, which can by suitable culture be converted into productive coffee estates."

The above is the concluding portion of an interesting article by Mr. H. J. Wigman in the 5th No. of the "Teysmannia." The article contains an account of the Republic of Liberia, and in my opinion is of much interest. Shall I send you a translation of the whole? How beautifully got up is the "Teysmannia"—paper, type and all well worthy of the countrymen of Laurens Koster. As far as I can learn the name of the work is adopted from the name of a botanist called Teysman, with a Latin termination.

[We shall be glad to have translation of both articles for our *Tropical Agriculturist*.—Ed. *T. A.*]

THE STAMPING-OUT OF CATTLE MURRAIN

Belgravia, Sept. 23rd.

Dear Mr. Editor,—If not too late, in reply to your excellent editorials, beginning in your issue of 5th August last, evidently called out by your correspondent "Truth"'s remarks on cattle disease and its prevalence and causes, I agree with every word "Truth" says, and would if able say far more and severe things regarding *those* who have so long stood aside and allowed murrain period after period to sweep over the land, kill out its herds, impoverish the poor cultivators and bring them by many thousands to misery, want and ruin.

I at least am convinced, after an experience of more than 30 years, and maybe with better opportunities than many, while at the same time my early training fitted me to see and appreciate, and watch the progress of disease during this long period;—I now say no more fruitful cause of poverty prevails among the native cultivators of the soil than that of cattle murrain, call it by what name you may. Cattle are the chief wealth of the rice cultivator, while they are the mainstay of the numerous cart drivers and tavalam men.

The *cry* of improvement of the breeds, of their degeneracy, of better housing and feeding are all to me mere surplusage. The better you breed, the more you feed, the more you lay your herds open to contagion, as long as the disease is allowed to go rampant over the land.

It has ever been, in the matter of cattle here, "a survival of the fittest." Hardy and untended, a remnant has always escaped, and pray who but a madman would go to any expense to improve stock, without the security of a single month's freedom from the ravages of disease let loose on him at any moment and at any point of his surroundings?

Your valuable discussion of the whole question has not, in my opinion, improved the condition of things one *iota*. Strike at the roots of the evil, "suppress the disease," and render it manageable and then *think of improving, feeding and housing*; and not till then. I shall in another article follow all your reasoning so well and full and exhaustively done; yet you have not touched on the main cause of all the evil at least with a practical suggestion.

You represent me as "bloodthirsty," standing with a poleaxe ready to destroy half the cattle in Ceylon. You quite misunderstand me. I no more want the disease to gain a footing than does our admirable C. M. staff *in re* cholera when it appears. W. S.

[By all means let us hear our correspondent's scheme for stamping out murrain. No one would more heartily rejoice at the success of such a scheme than we. The difficulty is that here in Ceylon, as in continental India, rinderpest is not merely an occasionally imported pest, but an indigene of the land, lurking in the byplaces of bad shelter and insufficient food and every now and again vivifying into virulence. If the Madras Government has failed to extirpate the evil, we fear we cannot be much more successful. But let us have our correspondent's remedy for what is, confessedly, one of the greatest of evils.—Ed. *T. A.*]

A FEW TEA NOTES.

SIR,—Some little time ago there was a discussion between tea planters and tea buyers, many of the former asserting that they do not get full value of teas sold at the weekly auctions, and in consequence ship direct to London. On the other hand tea buyers maintain they have orders from various parts of the globe which it is impossible to fill, even though they are prepared to pay more than the London valuations. There is no doubt whatever that much business from foreign countries, formerly passing through London, is now coming direct to Colombo, but if these orders cannot be promptly fulfilled they will again revert to Mincing Lane to the detriment of local firms and the growers themselves. I cannot by any means agree with the latter as to the local market not being so good as Mincing Lane. There may be exceptional cases where monies have realized higher prices at home, but in the long run I feel sure planters will benefit by supporting the local sale room. It is well-known by Colombo tea men that large sums have been dropped by buyers at local sales who have resold in Mincing Lane. Many firms have bought tea as a speculation, or as a form of remittance hoping to save something in exchange, and those who study the Mincing Lane Circulars can see that losses have been made to the extent of even 5d per lb. Of course where they have private outlets they come out alright, but I think I can safely say, that those who have bought teas here and sold at London auctions have lost money somewhat heavily, taking the year all round. On an upward market they may now "score" for a time, but as a rule any upward tendency is fully discounted in Colombo, as witness recent sales.

I know of two cases where local firms have received foreign orders for particular brands. In one case the sellers wanted over a rupee per lb. for that which has only been fetching about 10d per lb. in Mincing Lane. In the other instance the difference was not so marked, yet quite sufficient to prevent the order being placed in Ceylon. In both these cases the orders will revert to London, so that the planters will lose a good market and the merchants their commission.

It follows, therefore, that those planters availing themselves of the services of local brokers have invariably reaped higher prices for their teas through the spirit of speculation or competition amongst buyers in Colombo, than they would have done had they themselves speculated by shipping their produce to a market 6,000 miles away.

UPIDU.

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, Oct. 11th.

DEAR SIRS,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 18th September 1890.

EXPORTS OF INDIAN TEA FROM CALCUTTA.

	1890 lb.	1889 lb.	1888 lb.
Exports to Great Britain in Sept.	14,263,059	16,253,978	12,188,328
Exports to Great Britain from 1st May to 30th Sept.	40,415,251	40,761,934	40,025,482
Exports to Australia and New Zealand in Sept. ...	712,200	806,863	495,061
Exports to Australia and New Zealand from 1st May to 30th Sept. ...	2,293,446	1,807,392	1,344,564
Exports to America in Sept.	25,837	23,596	19,990
Exports to America from 1st May to 30th Sept. ...	62,072	90,847	63,119
Exports to other places in Sept.	195,095	154,311	158,867
Exports to other places from 1st May to 30th Sept.	526,277	1,061,604	464,217
Total Exports from 1st May to 30th Sept. ...	43,297,046	43,721,777	41,897,382

—Yours faithfully, S. E. J. CLARKE, Secretary.

RUTHERFORD'S AND STREET'S TEA TABLES.

Oct. 1st.

SIR,—Attention having been called in your columns to the alleged incorrectness of Mr. Rutherford's figures, I have taken the trouble to compare them with those of Mr. Street, and I must confess that I am somewhat mystified as to the manner the calculations have been made: they do not appear to agree with each other at all, and both are at variance with the *true* equivalents in Ceylon currency—for instance, in *Rutherford's Tables* it is stated that at

London price. per lb.	Exchange rates.	Equivalent in Colombo. Cents.
1s 4d	1s 2d	101
1s 4½d	1s 2½d	100·50
1s 5d	1s 3d	100
1s 5½d	1s 3½d	99
1s 6d	1s 4d	100
1s 6½d	1s 4½d	100
1s 7d	1s 5d	100
1s 7½d	1s 5½d	101
1s 8d	1s 6d	100
1s 8½d	1s 6½d	99·50
4s 9d	1s 7d	100

Clearly if we take off the 2d per lb. (allowed for by Mr. Rutherford for freight insurance charges) from the London prices for tea mentioned above we have figures remaining exactly the same as the rates of exchange placed alongside them, and the result must, of course, in *each* of the above instances, be neither more nor less than 100 cents (by taking off 19 cents allowed to buyers of leaf and dividing the result by 4 the *correct* price of green leaf as calculated by Rutherford is arrived at.) In Mr. Street's tables it is stated that

Colombo price	Exchange rates s d	Laying down cost in London per lb. in pence.
100	1 2	1s 4·61d
100	1 2½	1s 5·16d
100	1 3	1s 5·74d
100	2 3½	1s 6·28d
100	1 4	1s 6·83d
100	1 4½	1s 7·40d
100	1 5	1s 7·94d
100	1 5½	1s 8·50d
100	1 6	1s 9·05d
100	1 6½	1s 9·63d
100	1 7	1s 10·17d

The differences between Mr. Street's "laying down cost in pence in London" of the above as compared with Mr. Rutherford's system of *always* calculating 2d per lb. to cover *all* London charges for freight, insurances, selling, commissions, &c., &c. (and which is a very convenient plan, for he gives at foot of his tables the cost equivalents of *each farthing* of these charges, under each rate of exchange so that with low freights or high freights, the exact calculation can always be readily arrived at whenever London charges amount to more or less than 2d per lb.) is very considerable, thus—by Mr. Ruther-

ford's *system* (*not* his figures ! !) 100 cents give selling price in London

Exchange...... ......1s 2d, 1s 2½d, 1s 3d, 1s 3½d, 1s 4d 1s 4½d, 1s 5d, 1s 5½d, 1s 6d, 1s 6½d' 1s 7d.

H. K. Rutherford...1s 4d, 1s 4·50d, 1s 5d, 1s 5·50d, 1s 6d, 1s 6·50d, 1s 7d, 1s 7·50d, 1s 8d, 1s 8·50d, 1s 9d.

F. F. Street .. ..1s 4·61d, 1s 5·16d, 1s 5·74d, 1s 6·28d, 1s 6·83d, 1s 7·40d, 1s 7·94d, 1s 8 50d, 1s 9 05d, 1s 9 63d, 1s 10·17d.

Evidently Mr. Street's tables are intended for buyers of tea in Colombo, and thus include a good FAT commission sufficient to make a tea grower

ENVIOUS.

TROPICAL PRODUCTS IN BRITISH NORTH BORNEO.

Kandy, Oct. 3rd.

DEAR SIR,—I send a pamphlet on coffee, cacao and other tropical products grown in British North Borneo, compiled by Mr. Henry Walker, the Commissioner of Lands, an old Ceylon resident. Mr. F. G. Callaghan and Mr. P. Christian, whose names appear in the pamphlet, are also old residents.

I have lately received from Mr. Christian an estimate of the cost of forming a Liberian coffee plantation in British North Borneo of 200 acres, in which he estimates the total cost inclusive of the purchase of land for the first 3 years and laying down the produce in London at R50,000

At the end of the 3rd year, he estimates a crop from these 200 acres, cwt. 1,000 at £4 10s=£4,500 at 1s 8d exchange R54,000

Net profit .. R4,000

For the 4th year such an estate would probably give from cwts. 6 to cwts. 8 per acre, say cwts. 1,400 laid down in London at a cost of R16,000.

The above information I hope will be interesting to your readers, and I remain, yours faithfully,

W. D. GIBBON.

CEYLON TEA AND ITS NATURAL MARKET.

SIR,—"Vendor" in your issue of 3rd instant concludes his letter by calling upon Mr. Street to revise his table "a little." I second that suggestion, but I would say "a good deal" instead of "a little."

It is patent to anyone making use of that table (F. F. Street's) that it includes not only the *very full* allowance of 2d for London charges, *i.e.* freight, insurance, landing, rents and selling commissions of brokers and agents in London, but also a Colombo buying commission of from 4 to 6 per cent or it may be more. Having bought Mr. Street's tables and used them, never thinking that they contained any item such as Colombo buying commission. I would now ask Mr. Street through your columns to state what percentage of Colombo commission his figures include.

We want new tables based on 1½d which now-a-days covers every charge in London account sales. Vendors of green leaf would then deduct (not 19 cents as allowed by Rutherford, but) 13 cents to cover all cost of manufacture, &c., and the remainder divided by 4 would give the correct value of

LEAF.

P.S.—On the new basis of 1½d off only for London charges, vendors would then expect to see 100 cents precisely marked in the tables whenever the selling price of tea in London was say 1½d per lb. more than the rates of exchange mentioned in th tables, thus:—

Selling Price.	Exchange.	Cents.
s. d.	s. d.	
1 11½	1 10	100
1 10½	1 9	100
1 9½	1 8	100

Rutherford's tables (based on 2d London charges) do not bear this test—he is often out 1 and 2 cents —100 cents being by him stated sometimes as 101 and at other times as 99.

CUBEB CULTIVATION.

Colombo, Sept. 15th.

To the Secretary of the Ceylon Planters' Association, Kandy.

Dear Sir,—At the request of Mr. H. VanPrehn of Plaver, I beg to enclose translation of a letter for your perusal and trust it may prove of interest to your Association,—I am, sir, yours faithfully, (Signed) RICHARD REMMERS, Consul for the Netherlands.

Plaver, near Salatiga, Java, Aug. 17th.

The Consul for the Netherlands, Colombo.

SIR,—Having read in one of the Indian papers that the planters of Ceylon are trying to secure Cubeb plants from here since those planted some years ago by them did not grow, I beg to inform you that I can supply these plants during November next at fl. 0 15 ea. delivered on my estate and fl. 0 20 per plant delivered at Samarang, and should wish to know whether you will be good enough to advertise the sale of them in one or more of your local papers at the prices above stated. It is my intention in the meantime to advertise the sale of these plants in the Java newspapers towards the end of next month, and should any of the Ceylon planters require them they must send their orders in time. I may mention that the plants are placed in bamboo pots so as to secure them from damage.

Thanking you beforehand for the trouble I am giving you, I remain, sir, your obedient servant,

(Signed) H. VAN PREHN.

THE REPORT of the Cinchona plantation and factory of the Government of Bengal, under Dr. King and Mr. Gammie, shows a falling off in the profits as compared with the previous year. The loss was partly due to a general depression in the cinchona industry, and to the large exportation from Ceylon having reduced prices. The year marks an era in the manufacture of the febrifuge, for during it the new fusil oil process for extraction entirely superseded the old acid and alkali process. The sales of febrifuge and quinine during the year were in quantity between 7,000 and 8,000 pounds at R14 per pound for cinchona and R17 per pound for quinine ; and the sum realized was R1,13,000, roundly, as compared with R1,29,000 the year before.—*Madras Times.*

AERATED TEA.—It is said we may shortly expect to see a company launched for the manufacture and sale of the aerated tea respecting which my letters a short time back gave you some account. A specimen of the bottles in which this new competitor for public favour is to be sold has this week been shown to me, and from the label it bore I see the proprietors have chosen as the name by which the beverage is to be known "Theafoam." Not a bad name, we think, for a liquor which pours out with a fine, sparkling, frothy head. Some of us venture to predict for this liquor a very large amount of popularity, and in that case, should its consumption ultimately at all approved that of some other well-known effervescent beverages, its manufacture may have a sensible effect upon the consumption of your island grown teas.—*Cor.*

NOTES ON POPULAR SCIENCE.

By Dr. J. E Taylor, F.L.S., F.G.S., &c., Editor of "Science Gossip."

In a few years the world will be one botanical parish. The distribution of plants, and their localisation here and there, is one of the most suggestive of scientific generalisation. How did special plants get to special places? None even of the ingenious authors of the over-estimated "Lux Mundi" endeavour to explain it. But steam and increasing population are giving the finishing stroke to the phenomenon. Plants characteristic of different countries are getting dreadfully mixed up. Certain "bush" seeds reach us from Australia, the Cape, the Argentine, &c., brought in the uncleaned fleeces of wool. The latter are washed and combed in Gloucestershire and Yorkshire, and the seeds are stranded on the river banks, or distributed by the agency of birds, so that they are spreading over the country, or they are brought in ships' ballast, and afterwards disseminated. In the north of England farmers are in the habit of putting the screenings of foreign wheat on the land, and a host of foreign weeds has sprung up in consequence.

Now that unknown Africa is becoming known, and a new and vast field for colonisation is likely to be opened out by the recently-founded East African Company, it is well to learn what science has to say upon that pest of the Dark Continent—the African fever. This is the unseen demon which haunts the European traveller in tropical and equatorial Africa by night and day. Once the system has been thoroughly steeped in it, it becomes chronic. He may have left Africa for ever, but the African or malarial fever will not leave him. Dr. Crumbie Brown, of Edinburgh, has just issued a *brochure* on the subject, which he has addressed to the secretaries of all British and American missions in hot countries. One of the newly-acquired territories of the above company has been very properly named "Livingstonia," after great traveller. Professor Drummond, in his delightful work on *Tropical Africa*, says of this place:—"It is one of the loveliest spots in the world, and it was hard to believe, sitting under the tamarind trees by the quite lake shores, that the pestilence which wasteth at midnight had made this beautiful spot its home." Dr. Brown is of opinion that the Australian blue-gum tree is the antidote to malarial fever. There is no worse place for malaria, even in Africa, than the Campagna at Rome. Few visitors to Italy dare bide there in the summer months. But the blue-gum tree was planted in the Roman marshes a few years ago, and the results have been remarkably successful. Thte microbe of malarial fever and the gum tree do no get on well together. The Trappist monastery in the Campagna had to be abandoned on account of the fever in 1868, but since the gum tree woods have been planted it has been reinhabited, although the place had previously gone by the name of "The Tomb." The Trappist brotherhood, aided by the Italian Government, are extending the cultivation of gum trees in the Campagna. When we have got real possession of tropical Africa, our first duty will be to plant forests of gum trees there.—*Australasian.*

SACRED TREES OF THE WORLD.

The palm, the oak, and the ash are the three trees which since times immemorial, were held to be sacred trees. The first among them, which figures among them, which figures on the oldest monuments and pictures of the Egyptians and Assyrians, is the date-palm (*Phœnix dactislifera*), which was the symbol of the world and of creation, and the fruit of which filled the faithful with divine strength, and prepared them for the pleasures of immortality. "Honour," said Mohammed, "thy paternal aunt, the date-palm, for in Paradise it was created out of the same dust of the ground." Another Mohammedan tradition of a later period says that when Adam left Paradise he was allowed to take with him three things—a myrtle, because it was the most lovely and the most scented flower of the earth; a wheat-ear, because it had most nourishment: and a date, because it is the most glorious fruit of the earth. This date from Paradise was, in some marvellous way, brought to the Hejaz; from it have come all the date-palms in the world, and Allah destined it to be the food to all the true believers, who shall conquer every country where the date palm grows. The Jews and the Arabs, again, looked upon the same tree as a mystical allegory of human beings, for, like them, it dies when its head (the summit) is cut off, and when a limb (branch) is once cut off it does not grow again. Those who know can understand the mysterious language of the branches on days when there is no wind, when whispers of present and future events are communicated by the tree. Abraham of old, so the rabbis say, understood the language of the palm. The oak was always considered a "holy" tree by our own ancestors, and, above all by the nations of the North of Europe. When Winifred of Devonshire (680-754 A.D.) went forth on his wanderings through Germany to preach the Gospel, one of his first actions was to cut down the giant oak in Saxony, which was dedicated to Thor and worshipped by the people from far and near. But when he had nearly felled the oak, and while the people were cursing and threatening the saint, a supernatural storm swept over it, seized the summit, broke every branch, and dashed it, "quasi superni motus solatio," with a tremendous crash to the ground. The heathens acknowledged the marvel, and many of them were converted there and then. But the saint built a chapel of the wood of this very oak, and dedicated it to St. Peter.

The sacred oaks, it must be admitted, do not seem to have always done their duty. Thus, for instance, a famous oak in Ireland was dedicated to the Irish Saint Columban, one of the peculiarities of the tree being that whoever carried a piece of its wood in his mouth would never be hanged. After a time, however, the holy oak of Kenmare was destroyed in a storm. Nobody dared gather the wood, except a gardener, who tanned some shoe leather with the bark; but when he wore the shoes made of this leather for the first time he became a leper, and was never cured. In the abbey of Vetrou, in Brittany, stood an old oak tree which had grown out of the staff of St Martin, the first abbot of the monastery, and in the shade of which the princes of Brittany prayed whenever they went into the Abbey. Nobody dared to pick even a leaf from this tree, and not even the birds dared to peck at it. Not so the Norman pirates, two of whom climbed the tree of St. Martin to cut wood for their bows. Both of them fell down and broke their necks. The Celts and Germans and Scandinavians, again, worshipped the mountain ash (*Fraxinus*), and it is especially in the religious myths of the latter that the "Askr Yggdrasil" plays a prominent part. To them it was the holiest among trees, the "world tree" which, eternally young and dewy, represented heaven, earth, and hell. According to the Edda, the ash yggdrrasil was an evergreen tree. A specimen of it (says Adam of Bremen) grew at Upsala, in front of the great temple, and another in Dithmarschen, carefully guarded by a railing, for it was, in a mystical way, connected with the fate of the country. When Dithmarschen lost its liberty the tree withered, but a magpie, one of the best prophesying birds of the north, came and built its nest on the withered tree and hatched five little ones, all perfectly white, as a sign that at some future time the country would regain its former liberty.—*Deutsche Rundschau in Public Opinion.*

DOMESTIC USES FOR AMMONIA.

A little ammonia in tepid water will soften and cleanse the skin.

Spirits of ammonia will often relieve a severe headache.

Door plates should be cleansed by rubbing with a cloth wet in ammonia and water.

If the color has been taken out of silks by fruit stains, ammonia will usually restore the color.

To brighten carpets, wipe them with warm water in which has been poured a few drops of ammonia.

One or two tablespoonfuls of ammonia added to a pail of water will clean windows better than soap.

A few drops in a cupful of warm water, applied carefully, will remove spots from painting and chromos.

Grease spots may be taken out with weak ammonia in water; lay soft white paper over and iron with a hot iron.

When acid of any kind gets on clothing, spirits of ammonia will kill it. Apply chloroform to restore the color.

Keep nickel, silver ornaments, and mounts bright by rubbing with woolen cloth saturated in spirits of ammonia.

Old brass may be cleaned to look like new by pouring strong ammonia on it, and scrubbing with a scrub brush; rinse in clear water.

A tablespoonful of ammonia in a gallon of warm water will often restore colors in carpets; it will also remove whitewash from them.

Yellow stains left by sewing machine oil, on white, may be removed by rubbing the spot with a cloth wet with ammonia, before washing with soap.

Equal parts of ammonia and turpentine will take paint out of clothing, even if it be hard and dry. Saturate the spot as often as necessary, and wash out in soap suds.

Put a teaspoonful of ammonia in a quart of water, wash your brushes and combs in this, and all grease and dirt will disappear. Rinse, shake, and dry in the sun or by the fire.

If those who perspire freely would use a little ammonia in the water they bathe in every day, it would keep their flesh clean and sweet, doing away with any disagreeable odor.

Flannels and blankets may be soaked in a pail of water containing one tablespoonful of ammonia and a little suds. Rub as little as possible, and will be white and clean and will not shrink.

One teaspoonful of ammonia to a teacupful of water will clean gold or silver jewellery; a few drops of clear aqua ammonia rubbed on the underside of diamonds will clean them immediately, making them very brilliant.—*Scientific American.*

THE MODEL DUKE ESTATE, TAVOY, BURMA.

Dear Sir,—In your paper of the 5th instant I see you have written a long leader on "*Exotics*," which does your paper great credit, and will be read with interest by all those interested in new products.

But you have been led into a mistake by the report on the experimental cultivation in Mergui, which I shall be much obliged to you if you will correct. You say in your first paragraph that you cannot allow the fact of the first *Tea* being produced in lower Tenasserim, by the officers of the Forest Department, to pass unnoticed. Now, I beg to inform you that the 172 plants remaining in the Mergui garden were made a present of by me to the "Local Government," through Mr. Palmer, then in charge of the Mergui garden. I gave over 300 splendid hybrid plants to Mr. Palmer in July 1886, and the remaining 172, are what have succeeded to grow, with the treatment they have received since! In October 1885, I got two maunds of Tea seed from Seaforth, Ceylon, a place opened up and planted by me.

The seed was selected from the finest trees on Seaforth and forwarded on here by Sir Graeme Elphinstone to me, so that I knew I have the best hybrid that could be produced in *India*, as I myself got the Seaforth Tea seed from there. This I shall prove to you by facts.

All the same, the greatest credit is due to Mr. Palmer, and Capt. now Major, Butler, who first started the garden. Capt Butler first started a small place on his own account, which drew the attention of Sir Charles Bernard when down there. Capt. Butler produced good tobacco, "Coffee Arabica," and had a few varieties of other products, which drew the attention of the worthy Chief Commissioner, and when he saw what scuccess Capt. Butler had attained, he gave a grant at once to start on Government account, on a small scale, so that Capt. Butler had a good 3 years' start ahead of me here.

When I came here Mr. Palmer took charge of the garden and took the greatest interest in it. I went down twice to Mergui, when he was in charge, and gave him advice what to do, which he carried out to the letter, and with good results. Mr. Palmer went down and lived for months in the garden and worked hard, for which I fear he never got the credit.

I went down last year and saw the garden: the oldest coffee was simply splendid and bearing a heavy crop. The gentleman in charge asked me to estimate the same, and I put it down at the lowest figure, viz. 8 cwt. per. acre; but many of the trees were bearing *a good round ton per acre.* The trees had been neglected, and not handled out after last year's crop. Of course this means discredit to no one, as officers being changed so often, they do not know better. Planting, like anything else, is very simple when once you know it.

The Liberian Coffee is a decided success. I have trees here now *12 feet high and 27 feet in circumference*, and loaded with a crop of fine bright Jolayea resembling a young Jack tree. I have planted up in all, in mixed products, 39 acres. I have Liberian Coffee, Tea, Divi Divi. Annatto, "Bixa Orellana," Croton Oil trees, Pepper Nigrum, Pepper Cubeb, Vanila, Rubber of three varieties viz. Hevea, Ceara and the "Tavoy Rope Rubber," indigenous to Tavoy district, Cocoa, and Jacks of three varieties, viz, Penang, hybrid and common. The Jack is a most valuable shade tree, as well as other value in itself, also mangoes of different kinds, oranges, lime and lemons, Leeches, guavas of 3 varieties, China and common plantains of 8 different kinds, also the China Banana, coconuts, and betelnut trees, now in bearing, Chestnuts just beginning to bear, fine large trees of a good kind, "Cotton" Pernambuco, or what is better known as "kidney cotton." One tree gave me over 3 lb. of produce this year! Cocoa must have shade to be a decided success, but this will be overcome in time, as the soil and climate are perfection for all the products now enumerated. Tobacco I have grown from Sumatra seed, and produced a fine, delicate, well marked leaf. Indigo grows wild in the Tavoy district. Cardamoms also grow wild here. This shows that the Tavoy district is to be the "Eldorado" for planters. Silvestre, formerly Editor of the *Indigo Gazette*, while down here prospecting, found the indigo plant growing wild near *Niadoung* and brought some in and manufactured a small piece. He took the same away with him. Silvestre came here to prospect, which I hope to hear more of it soon.

Coffee, Liberian, is to be one of the greatest successes in this district, and Tea, and Coco, also Arabian Coffee will grow at higher elevation. I never predicted, or said that Arabian Coffee would succeed at a low elevation, and it is only a matter of time and a selected variety from India, Mysore. To gain this end we only want roads up the mountain sides. I planted about 7 or 8 acres with Arabian Coffee here, but of course I had not sufficient elevation. It grew fine. I got the seed from Mr. Petley in the Toungoo Hills, so that I might be clear of leaf disease. It gave a good crop, in fact *too much* the second *year*, and then went out. I sent home a hundredweight in 1887 to Mr. Marlin Leake in London, and it was well reported upon and sold at a fair price.

You will see by this, Mr. Editor, some of the difficulties a planter has to contend with in the beginning in a new country. No one has any idea of the many losses and disappointments one has to contend with at first, even to get seed in a fit state to plant, often rotten before I saw it, seed sent on to Calcutta, from Calcutta to Rangoon, and from thence to here, and often delayed *en-route*.

When the thing is once set agoing there's no more such risks and losses.

The pioneer has the great battle, and should he not succeed in all, he gets all the blame and lots of kicks behind his back. They do not come forward

as honest men and argue the point. It is also hard to do any business with men that do not know the work to be done. No man can make a silk purse out of a sow's ear; money must be first sunk and wait patiently for returns. Coffee and tea planting are not like a crop of potatoes, more especially in a new country. *Exotics* must be acclimatized, and it takes longer in a new country for a new product to the country to come into full bearing. This is clearly shown by the Liberian coffee in Mergui, the same coffee only in full bearing in Mergui planted 3, or you may say 4 years before mine here from seed. People ask me of course—Where is your coffee, where are your returns, is the thing a success? This is the sympathy one gets as a pioneer. What is that fe-*l l*-ow *do-o*-ing down there; is he a planter I wonder or what? Well, I fancy I know the ropes now. But in this climate and with such strong soil, the Planter has nothing to fear; only he must be prepared to wait for returns longer, than one would do in a poor but forcing climate. Coolies will flock to Burma whenever the demand comes. No fear of labour, none in the least. I have a command of labour ready at my call at any moment. Why rice here is only one *half the price in Ceylon*, now only Rs 1·12 per basket, a basket about the same as a bushel, and in Ceylon rice is never cheaper with the planter than Rs 4, and it is impossible to predict a famine here although one had to get rice from Moulmein and carriage to the estate at a distance, it would never overreach Rs 3 here on an average. "Curry-stuffs," fish and fowls, and all necessaries are only about half the price from that in Ceylon, and the district is a healthy one. Opening up new land, of course, is not healthy for a short time, but much can be done by the planter to prevent sickness; all depends on good pure water and an elevated place for their habitations.

Besides, the Burmans work well when one once knows well their ways and treats them kindly and does not bully them. Jack Burman won't stand bullying; he has some pride in him. This is a good part even in poor despised Jack Burman, and he delights to work in the rain, and keeps in good health. I have sometimes as many as 200 working at one time and never had trouble with them in their work. Women and boys get annas 3 per *diem*, the rest 6 annas, and I could get hundreds.

Money is only wanted; all the elements are ready at hand, and coast coolies are ready to be called to Burma at any moment. Labor gives me not a thought. I see and know the way. Labor Laws, of course are much wanted for all Burma, but then you have to go to "India" to ask for this. This will come straight in due course.

Planters have nothing to fear here; I have received the greatest kindness and consideration from all the heads of the different departments, from Sir Charles Oosthwaite downwards; they are as good a set of men as could be found in any other part of the world, and ever ready to give assistance and information as far as lies in their power, and Burma will 'hang fire' until power is given to the Head administrators, not only to the Chief Commissioner, but Governor of Burma or Lt.-Governor with power to act on the spot. I have not the slightest doubt but that this project is near at hand, and then Burma will move forward quickly and staunchly.

I trust this long letter will not weary you, and I shall be much obliged to you, if you do not put it into your waste, paper basket or give it over to your Devil.

I remain, Dear Sir, Yours Sincerely,

JAMES D. WATSON.

4th September, 1890.

—*Rangoon Times.*

A METHOD of clearing forests by poisoning the trees has been introduced in New Zealand. An auger hole is bored into the trunk, and filled with a chemical composition, of which the secret is guarded. In two or three months the tree dies and rots, so that it can be easily removed. In one of the trials recently made no fewer than 700 acres were speedily cleared by this plan, but of course, with the loss of the timber.—*Globe.*

THE largest wheel in the world is being constructed by the Dickson Manufacturing Company, of Scranton, Pennsylvania, for the Calumet and Hecla Copper Mining Company, of Lake Superior. It is intended to lift the "tailings," or waste ore, from the mines of the company, and discharge them into the lake. The wheel is 54ft. in diameter and weighs 200 tons. On its rim are 448 steel buckets, which catch up the "tailings" as the wheel revolves. The velocity of the wheel at its tyre is 600ft. per minute, and it is capable of elevating enough sand in 24 hours to cover an acre of ground with a layer 1ft. deep.—*Globe.*

RECENT experiments by M. Georges Ville at Vincennes, and communicated to the French Academy of Sciences, show very clearly the value of nitrogen in manure for promoting the growth of vegetables. Plants grown with manure containing nitrogen were taller, heavier, and of a darker green than those grown in manure without nitrogen. The same plants grown in earth without manure were conspicuously dwarfish and feeble. The general result of his experiments is that the nature of the soil affects the plant in height, and shape, and colour, as well as in weight of the harvest. With regard to the question of height, it has long being known that Jersey cabbages require a particular soil in order to become very tall.—*Globe.*

WHEN Darwin and other naturalists made their experiments with so-called carnivorous plants, the importance of micro-organisms was not realised, and hence their results are questionable. In 1875, M. Edouard Morren investigated the behaviour of the *Pinguicula* and *Drosera*, and arrived at a conclusion quite different from the opinions of Darwin on these interesting plants. Another series of experiments on the *Nepenthes* has been undertaken by M Raphael Durbois, whose results have just been communicated to the Académie des Sciences, Paris. Sir Dalton Hooker considered that the carnivorous attributes of the *Nepenthes* was beyond a doubt, but M. Dubois has found reason to differ with him. His observations were made on a great variety of these plants at the botanical garden of the Tête d'Or, Lyons, for example the *N. Rofflesiana, Hookeriana, coccinea, phyllamphora, distillatoria, hybrida,* and *maculata.*—*Globe.*

"A WAIL FROM FOOCHOW" might well describe the following which we find in the *N.-C. Herald* of Aug. 22nd:—

From Foochow we have the following tea news, under date the 16th instant:—The shipments during the past fortnight have barely reached a million of lb. The calling steamers have been the "Palamed," "Ajax" and "Pakling." The export to London and the Continent stands today at $10\frac{1}{4}$ millions against 11 millions last year and $17\frac{1}{2}$ millions in 1888. The tone of the market remains quiet. The settlement of 21,000 chests Congou for two weeks is again very small; and, but for the demand for Australia, it would have been very much smaller, as the telegraphed advices regarding Foochow Congou in the London market are sufficiently bad to cause a stoppage of shipment to that quarter altogether. Souchongs have continued in demand and there has been some business in Oolongs and Scented teas. Comparing the latest prices paid with those ruling a fortnight ago, there is no change of importance to note. Tael prices, as lately remarked, are low; but the laying down cost, with the high exchange, is too near London quotations while that market is reported as declining. And in some cases costs are distinctly above Mincing Lane prices; common teas for example are Tls. 5 or $5\frac{1}{4}$d here, and in London only $4\frac{1}{4}$ to $4\frac{1}{2}$d per lb. As the inanimation in this market grows more prolonged, so the estimates of the total supply for the season become smaller. Whereas a fortnight ago a total approaching 380,000 chests was thought likely, 360,000 chests is now looked upon as the probable season's supply. The settlements of Congou to date are 177,000 chests. For the corresponding eleven weeks after the opening of the market last year 274,000 chests had been settled, and during the same period in 1888, 336,000 chests. The stock of Congou today is 156,000 chests against 168,000 chests last year, and 13,000 chests in 1888.

PLANTING IN CENTRAL AFRICA.—An ex-Ceylon planter now in Queensland writes that a relative—a trained arboriculturist—has just gone to Mandala near Lake Nyassa under an engagement to the African Lakes Co , to conduct experiments in the growing of tropical products. Mandalla and Nyassaland have one of the finest climates in the world. "The Moirs" have already a flourishing coffee plantation there.

NUTMEGS.—The cultivation of nutmegs in New Guinea is described by one who has witnessed it as a very interesting progress. The aroma of the nutmeg is so penetrating as to make the country for a long distance delightfully fragrant. The trees grow luxuriously and the fruit resembles a pear. When it ripens it opens and displays the nut with its beautiful red coating of mace. At this stage the nuts are picked off and carried in baskets into the house, where they are husked and put on shelves. Then they are partially roasted over a slow fire until all the moisture is extracted: Afterwards they are cooled and carried to the village in nets to await the traders. The nutmeg grows in perfection in the West Indies and Brazil, and may some day prove to be a valued product of some sections of this country.—*Madras Times*.

THE MUTURAJAWELLA PADDY FIELDS.—Mr. de Mel's scheme to irrigate and successfully cultivate the fields at Muturajawella is now an accomplished fact. Harvest operations have already begun, and the work is now in full swing. A good quantity of the paddy has turned out *Bol* or devoid of seed. This was due to the want of rain during the ripening season (July). The enterprising and genial proprietor of the fields, it is to be regretted, is unable to be present at the spot during the harvest owing to illhealth. Mr. de Mel is still confined to his room with an attack of fever, which he contracted soon after his return from Rakwana, whither he went in company with Mr. Obeysekere, as Directors of the Ceylon Gem Mining Company, Limited, to report on some Gem lands. It appears that during the journey both up and down the weather was very wet, and Mr. de Mel was considerably exposed to it. He caught a chill then, and is still suffering from its effects. Under Dr. Garvin's able treatment, we trust Mr. de Mel will be quite well before long.—*Cor.*, local "Examiner.'

ORIENTAL COFFEE COMPANY.—The fourteenth annual meeting of the shareholders of the above-named Company was held on Thursday week at the offices, No. 32, Great St. Helens, E.C., under the presidency of Mr, John Young. The Chairman moved the adoption of the directors' report and statement of accounts. The board expressed regret that the year's working had proved less favourable than was expected at that date of last meeting. The monsoon, then prevalent, proved abnormally heavy, rain and gales having been experienced for four months almost without intermission, doing much injury to the crop, which turned out only 53 tons 2 cwt. The deficiency, however, was to some extent compensated by higher prices, the average reached being 92s 3d per cwt., against 86s 9d the previous year. The balance sheet showed a net profit for the year of £660 16s 3d, and an available balance at the credit of profit and loss of £974 7s 5d, out of which the directors recommended the payment of a dividend of 2½ per cent, carrying forward £224 7s 5d to next year's account. The recent rise in the price of silver and rates of exchange affected the result of the year to some extent, and would, so long as it lasted, be very prejudicial to the planting interest. The prospects of the coming year had unfortunately been much affected by the unusual season above mentioned, rain having continued close up to picking time, and delayed it beyond the usual period, not giving the trees time to recover themselves before the blossoming season. The superintendent advised that he could hardly expect the coffee crop to be better than the last, and in this respect the district would be more favoured than Wynaad, where the crops were the most disastrous ever known. So far as could be judged at present, the prospect was in favour of higher prices than last year.—*Home and Colonial Mail*, Sept. 26th.

BANANAS.—The *Panama Star and Herald* says:—"We have received from New York a tabulated statement of the banana trade during 1889 between Central American and West Indian ports and the United States, which is full of suggestive interest to all who are following the development of this trade. Taking the New York branch of the business, which is the largest, we find that the total imports for the year aggregated 3,639,593 bunches, to which Jamaica contributed about one-third, or 1,346,062, whilst Colon only sent 216,528. The other shipments were as follows:—From Baracoa and Banes, 1,190,478; from Port Limon, 609,798; from Honduras, 276,727. The New Orleans banana trade for the same time was as follows:—From Honduras, 1,867,429; from Bluefields, 563,382; from Port Limon, 376,401; from Boca del Toro, 135,946; from Jamaica, 2,900—total, 2,946,058. Boston received during the same time shipments from Jamaica and Baracoa amounting to 1,292,946 bunches, whilst Philadelphia from these places and Bluefields received 853,183 bunches and Baltimore 358,294, making the entire annual importation of bananas to the United States 9,090,074 bunches, plus another 100,000 bunches estimated for other ports not specified in the statement."—*Colonies and India*, Oct. 1st.

CEYLON EXPORTS AND DISTRIBUTION 1890

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1890 B'nch & Trunk lb.	Tea. 1890 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1890 cwt.	Coconut Oil. 1889 cwt.	Pl'bago. 1890 cwt.
To United Kingdom ...	49174	100	49274	6554858	35544379	8457	123666	931879	227094	57101	83269	131002
,, Marseilles	157	...	157	12500	762	80	...	100460	2800	3000	...	...
,, Barcelona	...	...	...	...	600	...	...	35000	...	...	...	...
,, Genoa	12	...	12	...	1714	...	...	46425	33824	3422	2678	1134
,, Venice	71	232	303	70412	2435	...	...	11100	11200	...	...	...
,, Trieste	7830	97	7927	252	1670	...	...	3900	8848	15242	6730	...
,, Odessa	32	...	32	...	265	...	...	...	...	3344	5415	...
,, Hamburg	296	...	296	730	33339	814	1131	246400	80772	16568	7665	30895
,, Antwerp	17	20	37	217919	1600	...	...	19500	5600	1161	1492	13949
,, Bremen	18	...	18	...	13787	151	...	20606	...	...	...	5068
,, Havre	...	100	100	...	4761	...	...	10000	...	2007	4578	...
,, Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
,, Africa	16	...	16	...	37022	...	...	5000	...	8	34	...
,, Mauritius and Eastward	277	333	610	...	83018	498	...	28500	...	41265	2 18	...
,, India	837	718	1555	...	100550	...	140522	5020	...	71813	3.587	241
,, Australia & New Zealand	8632	1120	9752	...	1799175	9	40	8474	...	1213	1944	342
,, America	1924	...	1924	317658	183879	1509	4956	89228	...	38322	82758	115469
,, Stockholm	...	...	...	...	1703	...	...	...	...	...	...	...
,, Constantinople ...	...	...	...	...	2122	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 30th Oct. 1890	69296	2720	72016	7195713	37812781	11573	270315	1561492	381338	254476		299716
Do 1889	58487	406?	62668	7876144	27262507	11757	229879	2005752	383204	232268		32.589
Do 1888	113578	4435	118013	10935574	18490110	10419	220175	1392564	396159	300727		207762
Do 1887	147182	6972	154202	10244557	10322574	14005	251839	1208751	226152	303652		167655

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis Peat's London Price Current, September, 25th 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	Slightly softish to good / Hard bright...	£5 10s a £7 10s
Yellow ...	Do. drossy & dark ditto	95s a 110s
CINCHONA BARK--Crown per lb.	Renewed ...	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings ...	2d a 9d
	Branch ...	1d a 3d
Red	Renewed ...	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings ...	2d a 5d
	Branch ...	1d a 3d
	Twig ...	1d a $1\frac{1}{2}$d
CARDAMOMS Malabar	Clipped, bold, bright, fine	1s 8d a 3s 6d
and Ceylon	Middling, stalky and lean	2s 6d a 3s
Alleppee	Fair to fine plumpclipped	1s 4d a 3s 4d
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, bri	1s 6d a 2s 8d
Long Ceylon	Middling to good...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill ...	$7\frac{1}{2}$d a 1s 7d
2nds	,, ,, ,, ,, ...	7d a 1s 4d
3rds	,, ,, ,, ,, ...	6d a 1s 2d
4ths	Woody and hard ...	$5\frac{1}{2}$d a 11d
Chips ...	Fair to fine plant...	$2\frac{1}{2}$d a $7\frac{1}{2}$d
COCOA, Ceylon ...	Bold to fine bold ...	96s a 100s
...	Medium ...	85s a 95s
	Triage to ordinary ...	55s a 75s
COFFEE Ceylon Plantation	Bold to fine bold colory ...	10?s a 113s
	Middling to fine mid. ...	105s a 107s 6d
	Low mid. and Low grown	100s a 104s 6d
	Smalls ...	100s a 104s
Native	Good ordinary ...	92s a 98s
Liberian ...	Small to bold ...	90s a 99s 6d
East Indian ...	Bold to fine bold...	105s a 115s
	Medium to fine ...	100s a 105s
	Small ...	93s a 98s
Native	Good to fine ordinary ...	92s a 98s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£15 5s a £28
Stuffing ...	Coarse to fine ...	£5 a £18
COIR YARN, Ceylon ...	Ordinary to superior ...	£13 a £30
Cochin ...	Ordinary to fine ...	£12 a £36
Do	Roping fair to good ...	£12 a £15 10s
COLOMBO ROOT sifted ...	Middling wormy to fine...	18s a 27s 6d
CROTON SEEDS, sifted ...	Fair to fine fresh...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold...	50s a 65s
,,	Small and medium ...	26s a 39s
Rough	Fair to fine bold ...	20s a 25s
,, ...	Small ...	14s a 18s 6d
GUM ARABIC, Madras...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	10s a 12s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES ...	Good to fine picked ...	10s a 10s 9d
	Common to middling ...	8s a 8s 9d
	Fair Coast... ...	8s 9d a 9s
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	$\frac{3}{4}$d
LEMON GRASS ...	,, ,, ,, ,, ...	$1\frac{1}{2}$d a $1\frac{3}{4}$d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	$4\frac{7}{8}$d a $5\frac{1}{4}$d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White ...	,, ,, ,, ...	1s $1\frac{5}{8}$d a 1s $2\frac{1}{8}$d
PLUMBAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright ...	5s a 9s
RED WOOD ...	Fair and fine bold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to fiine flavor ...	£30 a £58
Do. chips ...	Inferior to fine ...	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	5d a 8d
	Fair middling medium...	2d a 4d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	16s a 18s
Do. ...	Mixed middling [bright	15s a 16s
Do. ...	Bulbs ...	10s a 12s
Cochin ...	Finger ...	11s a 12s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	16s a 23s
2nds	Foxy & reddish 5 a 8 ,,	13s a 18s
3rds	Lean & dry to middling under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Socotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	32s a 35
	Ordinary and middling...	28s a 31s
FROM BOMBAY AND ZANZIBAR.	**QUALITY.**	**QUOTATIONS**
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright ...	$5\frac{1}{2}$d a $5\frac{3}{4}$d
	Common dull to fair ...	$4\frac{7}{8}$d a $5\frac{3}{8}$d
Stems...	Common to good ...	$1\frac{1}{8}$d a $1\frac{1}{4}$d
COCULUS INDICUS ...	Fair ...	10s a 11s
GALLS, Bussorah & Turkey ₩ cwt.	Fair to fine dark blue ...	52s 6d a 57s 6d
GUM AMMONIACUM per [cwt.	Good white and green...	40s a 50s
	Blocky to fine clean ...	20s a 50s
ANIMI, washed, ₩ cwt.	Picked fine pale in sorts,	£13 a £15s
	part yellow and mixed	£10 a £13
	Bean & Pea size ditto ...	£5 a £8 10s
	amher and red bold ...	£10 a £12
scraped...	Medium & bold sorts ...	£5 a £8
ARABIC E.I. & Aden ..	Sorts ...	32s a 75s
per cwt. Ghatti ...	Sorts to fine pale ...	20s a 65s
Amrad cha	Good and fine pale ...	50s a 65s
	Reddish to pale brown ...	25s a 45s
ASSAFŒTIDA, per cwt.	Clean fair to fine ...	26s a 38s
	Slightly stony and foul ...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 30s
MYRRH, picked ,,	Fair to fine pale ...	£5 a £7 10s
Aden sorts	Middling to good ...	72s a 6d a 80s
OLIBANUM, drop per cwt.	Fair to fine white ...	35s a 55s
,,	Reddish to middling ...	25s a 34s
pickings...	Middling to good pale ...	12s a 20s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER Mozambique, per lb.	red hard ...	2s a 2s $6\frac{1}{2}$d
Ball & Sausage	white softish ...	1s 5d a 2s
	unripe root ...	1s a 1s 11d
	liver ...	1s 3d a 2s 3d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb.	Nearly water white ...	4d a $4\frac{1}{4}$d
2nds ,, ...	Fair and good pale ...	$3\frac{5}{8}$d a $3\frac{3}{4}$d
3rds ,, ...	Brown and brownish ...	$3\frac{1}{4}$d a $3\frac{1}{2}$d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 6d
	Common foul and mixed	9d a 1s 10d
Rangoon ...	Fair to good clean ...	2s a 2s 4d
Madagascar	Good to fine pinky & white	2s 9d a 3s 2d
	Fair to good black ...	2s a 2s 6d
SAFFLOWER ...	Good to fine pinky ...	60s a 70s
	Middling to fair ...	40s a 60s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	22s 6d a 24s
,, ...	Common & middling soft	12s a 21s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb.	Middling to fine ...	2d a $3\frac{1}{4}$d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ₩ cwt.	Good, pure, & dry white	152s 6d a 160s
Japan ...	,, ,, pink	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	38s a 40s
	Pressed	Nominal
Block [per lb.	Good ...	25s 6d a 25s 9d
GUTTA PERCHA, genuine	Fine clean Banj & Macassar	3s 6d a 5s
Sumatra...	Barky to fair	2s a 3s 9d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	2s a 3s
	Inferior and barky ...	1s 4d a 2s
NUTMEGS, large, per lb...	57's a 80's, garbled ...	2s 10d a 4s
Medium ...	83's a 95's ...	2s 8d a 2s 9d
Small ...	100's a 160's ...	1s 6d a 2s $7\frac{1}{2}$d
MACE, per lb. ...	Pale reddish to fine pale	2s 6d a 2s 10d
	Ordinary to fair ...	2s 1d a 2s 4d
	Chips and dark ...	1s 6d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 2d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	9d a 1s 2d
	Dark, rough & middling...	3d a 7d
SAGO, Pearl, large, ₩ cwt.	Fair to fine ...	17s a 18s
medium ...	,, ,, ,, ...	15s a 17s 6d
small ...	,, ,, ,, ...	10s 6d a 13s
Flour [per lb.	Good pinky to white ...	8s a 12s
TAPIOCA, Penang Flake	Fair to fine ...	2d a $2\frac{1}{4}$d
Singapore ...	,, ,, ...	$1\frac{7}{8}$d a $2\frac{3}{4}$d
Flour ...	,, ,, ...	10s a 15s
Pearl ...	Bullet, per cwt. ...	21s a 21s 6d
	Medium ,, ...	17s a 18s
	Seed ,, ...	16s a 17s 6d

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for November :—

VEGETABLE MANURES AND CHEAP FERTILIZERS.

VEGETABLE manures, like cattle manure, contain all the ingredients of ordinary crops, and hence may be called general manures, though they are more slow-acting than cattle manure, and contain a larger percentage of water. They may be applied alone or mixed into a compost with cattle manure. Many of them contain an excess of nitrogen, and are sometimes classed under nitrogenous manures. The action of green manures may be said to be three-fold: they act mechanically, rendering the soil more open; they supply humus; and lastly, they act as true manures, contributing the soluble ingredients of plant food to the soil. The value of vegetable manures depends on the kind of plant as well as the part of the plant used. When crops (such as the legumes) are ploughed directly into the land upon which they are grown for the special purpose of supplying a green manure, it is as a rule advisable that they should be taken out of the land just before flowering, as at this stage they contain the maximum of valuable ingredients in leaf and stem. For green manuring by burying in the whole crop, rapid-growing plants are most suitable. Sometimes the crop-residue only is used after the harvesting of the crop, and in the case of leguminous crops it has been often found that the root-system is equal in weight to the weight of the crop above ground. The roots of this order of plants when buried in the soil have a very beneficial effect on poor soils. Whatever may be the doubts that exsit as to the exact manner in which the leguminosæ improve the soil by accumulating nitrogen in the land, that they do so, and that the ploughing in of them or any part of them improves the condition of soils, there can be no doubt of. Where the crop grown on the land is ploughed in, the main advantage derived is that the ingredients of plant food are collected and placed in a proper position and condition in the soil. Where, however, the green crop is transferred to the land, there is a distinct importation of plant food into the soil.

Peat is useful for soils deficient in organic matter, good dry peat containing about 1 per cent. of nitrogen and from 5 up to 20 per cent. of mineral matter, which contains fair proportions of phosporic acid and potash. Peat decomposes very slowly, and is best composted with lime. It is sometimes charred, and the residue used as a fertilizer either directly or after absorbing liquid manure. The charring process, however, causes the loss of almost all the nitrogen. Peat often contains injurious ferrous salts, and hence it is a good plan to treat it with lime before applying it to land.

Coconut husk should be applied in as fine a state of division as possible in the form of coir dust. The so-called coir dust as supplied from mills is often found to consist of husk for the most part in a long fibrous condition. It contains from 2·5 to ·5 of nitrogen and a fair proportion of mineral matter. Coconut fibre is a good mechanical agent and a splendid absorber and retainer of moisture.

Tanner's bark, owing to its hardness and thickness, decomposes with very great difficulty, and is therefore best applied after burning in spite of the loss of nitrogen which results.

Sawdust has little value as a manure since it is so slow-acting, though it is a good mechanical agent and an excellent absorbent. It should form a good medium for taking up the ammoniacal liquor of gas-works.

The leaves of trees may be said to contain nitrogen from ·5 to ·1, phosphoric acid ·1 to ·5, and potash from 1 to 3 per cent. They are either ploughed in directly or first composted. Some of the trees of which the leaves are used among native cultivators in the villages, are *Cerbera Odallam* (Sin. Kuduru), *Taprosia Purpurea* (Sin. Pila), *Croton Lacciferum* (Sin. Keppitya), *Pongamia Glabra* (Sin. Magulkaranda), and *Callicarpa Lantana* (Sin. Illa).

Sea-weed is another form of vegetable manure which was at one time much in vogue. In some soils it has been known to double the produce, and its use in potato cultivation is still kept up in Ireland, while in our own Island it is favoured in the Northern Province. In the Channel Isles there are certain restrictions placed on the collecting of sea-weed. The great objection to sea-weed is the large percentage of water (about 90 per cent.) it contains. It is found to consist of from 5 to 10 per cent. of mineral matter, the rest being organic matter which yields from ·2 to ·5 per cent. of nitrogen. Sea-weed, if heaped moist, decomposes tolerably readily, and is, where at hand, used with advantage for improving poor soils. Shells are generally composted with the weed, and this addition slightly increases the proportion of phosphoric acid and nitrogen derived from the remains of animalculæ in the shells.

Straw improves the mechanical condition of heavy soils, but decomposes exceedingly slowly, and is of little value as a manure. It is best used in the form of litter after having soaked in the liquid manure in cattle sheds or stables. Composts formed of the store of all refuse matter on cultivated land are of much value, and should be found on every property. These composts should be kept moist, but care should be taken that an excess of water should not be added. The heaps must not be allowed to become acid, as by this putrefaction is prevented: hence lime should be added which also promotes nitrification. Liquid matter must not be allowed to escape from the compost heaps which should be protected from the weather. Liquid manure and urine generally, as well as blood, are useful in soaking the heaps. The various forms of cakes used as manure, though coming under the head of vegetable fertilizers, are generally classed as nitrogenous manures.

OCCASIONAL NOTES.

We have on more than one occasion referred to the carelessness of cattle-owners in taking no precautions in times of diseases, to prevent their animals falling victims to fatal disorders. During the late outbreak of murrain along the Cotta road, the owners of cattle continued to allow their animals to wander about and pick up grass wherever they could find it, only bringing them home in the evening to be tethered to trees in the open air. Within a very small area in the vicinity of Borella some 70 animals died from murrain, and yet the cattle-owners in this part were making no attempt at segregating their stock. Though they were glad to accept or pay a limited sum for disinfectants, they objected to incur the small expenses of erecting sheds for the cattle to be kept and disinfected in. It is just here that the need is felt for Government interference through inspectors who should see that village cattle are not allowed to wander about in times of disease, or indeed at any time. In another column we note the restrictions which are placed upon the grazing of cattle on Government land in the Madras Presidency. The efficacy of disinfectants and other preventative methods (the only means of saving the lives of cattle exposed to contagion) has been amply demonstrated in the case of the cattle at the School of Agriculture escaping when murrain was raging all around them. A large cattle-owner in the vicinity of the school was unfortunate enough to have the disease imported among his herd, and lose some valuable animals, but judicious management even after murrain had gained a footing among his stock, was the means of effectually staying the plague. A poor milk supplier, who lost his herd of six cows, hesitated up to the last to lay out less than the value of one animal in erecting sheds and purchasing disinfectants. It is hardly credible that such conduct is the result of laziness which prevents these men from feeding their animals in their sheds instead of letting them loose to pick up their own food, and attending to both animals and sheds in a proper manner. It is rather the result of ignorance which engenders doubt as to the efficacy of disinfection and segregation in contagious and infectious diseases; and the evil results of this ignorance can only be minimised by enforcing some such measures as are adopted in the case of contagious and infectious diseases in man.

Professor Shield Nicholson, who was lately discovered to be an aspirant to literary fame, is Professor of Commercial and Potitical Economy and Mercantile Law in the University of Edinburgh, and author of "Tenant's gain not landlord's loss, and some other economic aspects of the land question." Professor Nicholson is a young man of a modest disposition, and a favourite among the students. About two years ago the Professor inaugurated a short course of lectures on Economics as applied to agriculture in connection with the agricultural curriculum at the University. He is a fluent speaker and a clever exponent of his subject.

"Trade Prospects in the United States" and "A Central Normal School of Agriculture" are the titles of two short pamphlets published by Professor Wallace of the Edinburgh University. The former is reprinted from the *Glasgow Herald* and the latter from the *Times*. In the one the Professor declares that the breakdown of the protective system in America is at hand, and goes on to show that a declaration of free trade by America would prove to be the most unfortunate event that England has seen for the last half-century. In the other he demonstrates that a Central Normal School of Agriculture will turn out a most expensive concern for which there is no necessity whatever in Great Britain. We hear that the Professor's new book on Australia will be published shortly.

INDIGENOUS FOOD PRODUCTS CULTIVATED AND WILD.

By W. A. De Silva.

31. *Bryophyllum, Calycinum*, Salisb. Sin. *Akkapana, Embulbovi* or *Ratagowa.*

This is a succulent plant which grows in all parts of the Island up to high elevations, and it is a weed found both in cultivated and uncultivated places, growing to the height of from 3 to 5 feet, and bearing panicles of peculiarly-shaped flowers. Its stem is round, thin and green, and its interior is filled with a succulent pith. Prominent scars are left at the places where leaves are broken from the stem. The leaves are thick and succulent, of an elliptical shape, and having crenulated margins which are of a brownish red colour.

The flowers, which are borne in large panicles, have a light greenish-coloured long tubular calyx having a beautiful delicate appearance. Before opening, the whole flower is enclosed in this calyx. The corolla is of a deep red colour, and the flowers contain a sweet nectar.

The leaves of this plant give out buds from their margins, and hence it propagates and spreads very quickly. The hardiness and the ease with which these buds come up are so marked that even a leaf plucked from a plant and nailed to a wall gives out small plants.

The leaves are of a sub-acid taste and are used in making salads as well as curries. The name Ratagowa has evidently been given to this plant, as its leaves are edible like that of the common gowa (cabbage).

Myrtaceae.

32. *Eugenia Aquea*, Brum. Sin. *Jambu.*

This is a tree commonly met with in the Island up to a high elevation. The trees attain somewhat large demensions. The stem is thick and round, and like most dicotyledonous trees it is much branched. The leaves are lanceolate, long, and dark green, with entire margins; and they have an acid taste. The flowers are large, often purple, and contain a large number of stamens arranged in the fleshy calyx. The fruits grow to the size of an egg, and are white when unripe, but attain a reddish hue when fully ripe. The pericarp is of a fleshy nature and covers a seed the size of an ordinary marble. The fleshy pericarp is of an acid taste when raw, but the ripe fruits have a sweetish sour taste. The fruits are much eaten, and the flowers and sometimes the young leaves are also eaten by children. The fruit makes a very good preserve.

The juice of the green leaves of this plant is used in cases of dysentery by native medical practitioners, while the bark is also employed in making decoctions.

33. *Eugenia Zeylanica.* Sin. *Maranda.*

Is a medium-sized tree growing in the hot drier parts of the Island. This is very commonly met with in cinnamon land. The tree is much branched, and the leaves are lanceolate with acute apices and entire margins. The young leaves are pink-coloured and give a very pleasing appearance to the trees. The flowers are small with glandulose calyces, and the fruits are about the size of peas, and white. The pericarp is fleshy and has a sweetish taste. This is generally eaten by boys. Except for this trifling use this plant can hardly be classed as a food product.

34. *Eugenia Caryophyllaea*, Wight. Sin. *Dan.*

This is a common shrub growing up to an elevation of 3,000 ft. It is generally met with on the sides of ditches or rivers, or in marshy places. The shrubs grow from 6 to 10 feet in height, and are covered from the base with branches. The leaves are elliptical with a prominent midrib of slightly dusty colour. The fruits are borne in clusters and are a little larger than peas; they are green and hard when unripe; but the ripe fruits are soft and jet black, and when bruised give a violet colour. These fruits are eaten, and in some places they are even sold in markets. They have a slightly astringent sweetish taste.

The bark and leaves are occasionally used in native medical practice.

35. *Eugenia Jambolana*, Lam. Sin. *Madan.*

This is a tree growing in the drier parts of Ceylon. It grows to a medium size and is generally common in cinnamon land, and land containing fine soil. The trees are much branched on the top. The leaves are green with prominent nerves, and are leathery, entire, and of an elliptical shape. The flowers resemble the other myrtaceous plants. They bear oblong fruits about double the size of an ordinary pea. These when raw are of a green colour, but when ripe they become jet black, giving a deep violet colour when bruised. A single tree bears many bushels of these fruits in a season which are relished much. They have a sweetish aromatic taste. During the season they find a way into the markets. The timber of this tree is hard and elastic, and is used for various purposes. It is said that it has been successfully tried as railway sleepers, and there is a movement on foot to plant them extensively for this purpose in Victoria.

The bark contains a good deal of tannic acid, and has proved to be a good tanning material. The bark and the leaves are used medicinally by the native practitioners of Ceylon. It is stated that some German physicians have found out some remarkable properties in the seed, which has proved to be a remedy for diabetes; and experiments are being made to test its value as such more fully.

CEYLON BEE CULTURE. VI.

By Aba.

Since writing my last article on the above subject, I was agreeably surprized to read in the *Ceylon Observer* a very interesting account of the domestication of the Bambara by Mr. J. Holloway of Wattegama. That gentleman says that a swarm of the Bambara lived for months in 1883 in a hive sent out from Germany and kept in the verandah of his house. He also mentions a very nearly successful attempt to import the Bambara into Germany, where it is said that a colony of this bee would be worth £50.

The fourth species of Ceylon bee is the *Kana Veyiya*, a tiny bee belonging to the Trigonæ. This insect produces only a small quantity of honey, of rather an acid taste, which is used in native medicine. The combs are about 4 or 5 inches in circumference, and are built in the hollows of trees, crevices of rocks, buildings,

&c. The wax is dark-coloured and softer than ordinary bees wax. The bee is stingless.

So much for the different species of bees found in Ceylon. Now we come to consider about the cultivation or management of bees. The first thing necessary to be done in the formation of an *apiary* is the providing of a stock of bee-hives. As to the form and the materials out of which hives should be made opinions differ very widely both in theory and practice. In England hives made of either straw or wood have always been found the most profitable for bee-keeping, but those who wish to observe the movements of the bees employ glass hives or hives provided with glass-windows. Hives made of wood are neat in appearance and more durable than straw ones, but it is said that unless they are protected from the sun, the combs are liable to get melted and fall off. Earthenware hives are said to be in use in Turkey and Greece, and in our own country, as my readers are aware, a useless earthen pitcher or pot is the only hive provided for a swarm of bees to settle in.

The form of the hive may be of any shape, but it is important that there should be sufficient room provided for building combs, &c.

At the Fairfield Apiary, Mount Barker, Australia, where they have more than 200 hives, the hive in use is the "Standard Langstroth," an American pattern, simple in construction and producing good results.

(To be continued).

NOTES FROM A TRAVELLER'S DIARY.

The country beyond Wahakotte is comparatively free from hills, and the villages are scattered irregularly amidst vast forests of timber trees. Each village has its own tank and grove of coconut palms close to which the dwelling houses are built.

On my visit to the famous rock-cave at Dambulla, my attention was drawn to the continual drip of water into the cave from a crevice in the rock. The water appears to be of the purest description, and is collected in an earthenware vessel left for the water to drip into. This water is reserved for the use of the priests.

Palugaswewa, where I made a halt, is about 20 miles from Dambulla. The village has its tank and a large tract of paddy land; but owing to a prolonged drought I found the tank dry, while the fields had been uncultivated for 3 or 4 years. From this place the Ritigala rock, reported to have been the Sanitarium of the Native Rajas who reigned in Anuradhapura, is visible. The summit of the rock is said to be occupied by some ruins as well as by the King's Garden.

I touched at a place called Andiyagala, where I heard for the first time of the experimental cultivation of potatoes in the North-Central Province. The schoolmaster of the place first experimented with potatoes on a very modest scale. He took only a single tuber, and having divided it into four sets, planted them during the rains of December. The plants came up well, and after 4 months, tubers to the weight of half-a-pound were dug up. The soil is rich in these parts, but the great want is rain. Arrowroot ought to be grown very successfully here, but up to now paddy and kurakkan are the only crops cultivated by the natives.

At Palugaswewa I saw for the first time the process of extracting lime from the kumbuk tree *(Terminalia glabra)*. There is no limestone from which to obtain lime in the neighbourhood, and lime is much needed for chewing with betel. About two baskets of the ash of this tree give one of pure lime. The ash is obtained by burning the stem and then sifting the residue to remove any impurities that may be mixed up with it. Next a paste is made by mixing the ash with the juice of the Hinguru plant *(Acacia concinna)*, and also that of the keliya *(Irewia microcos)*. The paste is dried into balls, or cakes like cabin-biscuits and burnt in a heap of dry cowdung either by placing in coconut shells or after wrapping in plantain leaves. The heaps of dung are sometimes made so large that they continue to burn for over 8 hours. The residue from this second burning is put into hot water where it remains for several hours. The water is afterwards poured off and the residual is lime. This lime is mostly used for chewing with betel-leaf, but in one place I actually found a house whitewashed with it.

THE CULTIVATION OF TOMATO.

(Lycopersicum Esculentum.)

By W. A. De Silva.

The tomato or the love-apple is a native of America, and was introduced to Europe at an early period; from Europe its cultivation as a garden product has extended to the Eastern countries.

It is at the present day grown to a large extent in Southern Europe as the climate is favourable there; and as the demand is great both for daily use and the manufacture of preserves it has become a paying crop.

The tomato is one of the common foreign vegetables grown in Ceylon both in the lowcountry and the cold hilly districts. The demand is fairly large, as all classes are fond of this fruit.

There are a great number of varieties of the tomato, known under different fancy names which are given to them by gardeners, and particularly by seedsmen; but the varieties which can be grown with advantage in Ceylon are those known as "the large red," "the yellow," and the "red currant." The last-named variety bears small oblong fruits, and the plants are hardy, grow well and produce abundantly, the only objection to this variety is the smallness of the fruit.

The first two varieties, the red and the yellow, grow well and also produce good crops. These two varieties are generally the favourites of the cultivators.

There are also varieties of tomatoes producing very large fruits, for instance 'the giant red' producing fruits weighing from 4 to 6 lb., but such varieties are not adopted for general growth as they produce very few fruits.

In the cultivation of the tomato the seeds have to be first put in a nursery. It is very important to test the germinative properties of the seed by growing a few first, and then putting down a quantity to obtain sufficient plants.

A flower pot or some vessel filled with fine earth and well-rotten dung would form a suitable nursery. After sowing the seeds they should be kept in a place not exposed to vertical rays of the sun. The nursery should be daily watered and weeded. The plants will be ready for putting down in the land, in three or four weeks.

The land should be well prepared by weeding, digging and levelling, and holes should be made three feet apart for the ordinary variety. These holes might be manured with well-rotten dung, ashes, &c. Care should be taken not to apply unfermented manure in the cultivation of tomatoes as such manure has a tendency to spoil the crops. The young plants should be carefully planted in these holes and watered daily when there is no rain. As the plants are growing the land should be carefully weeded, and the earth near the roots should be loosened once a week or so. When the plants grow to the height of about one and a half to two feet, sticks ought to be planted around them, so that they may grow erect.

A dressing of manure as before should be applied, when the plants have grown for a month or six weeks in the garden. In two months they show signs of flowering. All plants should be pruned above the third branch of flowers so as to obtain good fruits. The side shoots should always be suppressed and a single stem aimed at. The pruning and the suppression of the side shoots preserve materials which otherwise would be wasted in the formation of useless leaves and stems, for the formation of fruit.

The application of liquid manure to the plants at the fruiting stage helps to increase the crops. Liquid manure for this purpose may be advantageously prepared from any dung, or a mixture of dung and bone dust. In order to prepare the liquid manure, the dung should be kept in a vessel, with as sufficient water to keep it in a semi-liquid state for two or three days, so that it may ferment. A pound or two of dung thus prepared may be mixed with a can of water and applied to the plants.

It has also been found that a dressing of saltpetre mixed with earth applied to the plants makes them bear well. A pound of saltpetre reduced to powder and mixed with dry earth is sufficient for applying to a hundred plants.

The tomato, like all other plants, is subject to disease, and it is a pitiable sight to see a plant which was vigorous the previous day, drooping all its leaves and dying off, with flowers, buds, and young fruits on it. This occurs owing to an excess of moisture in the land. With well drained gardens and the occasional loosening of the soil to remove the excess of moisture this could be prevented.

As a food product the tomato is well known, while it is also believed that it possesses certain medicinal properties.

WAYS AND MEANS.

No insect can live under the application of hot alum water. It will destroy red and black ants, cockroaches, spiders, bugs, and a whole host of others. Take two pounds of alum and put it in three or four quarts of boiling water; let it stand over a slow fire until the alum is all dissolved, then apply it with a brush while nearly boiling hot to every part of shelves, closets, &c., where you suspect vermin to harbour.

A mixture of copperas and glue will protect trees from rats and mice.

Half-a-pound of Paris Green or London Purple to fifty gallons of water is sufficient. It needs to be kept stirred while being sprayed, otherwise the poison will sink to the bottom, as neither dissolves in water except to a slight degree.

The French say that when a large onion is planted by the side of a rose tree in such a manner that it shall touch the root of the latter, it increases the odour of the flowers. The roses thus produced will have, they say, an odour much stronger and more agreeable than such as have not been so treated, and the water distilled from those roses is very superior to that prepared by means of ordinary rose leaves.

The green ears of maize or Indian corn form a most delicious vegetable. The cobs should be plucked just as the styles, that elegant silky-looking appendage to the ears are beginning to turn brown and wither. The corn is then of a delicate cream colour. The cobs are stripped of their covering and boiled for about three quarters of an hour, and eaten with a little butter, pepper, and salt.

Tobacco water for killing insects, &c., is made by putting a pound of tobacco into four gallons of boiling water, and placing the vessel over a slow fire where the water will continue warm for some time.

Plants cannot live indefinitely deprived of their leaves. Hence preventing their appearance above the surface will kill them sooner or later.

Plants have greater need for their leaves, and can be more easily killed in the growing season than otherwise. Cultivation in a dry time is most injurious to weeds and beneficial to crops.

Avoid the introduction of weeds in manure or litter from weedy surroundings.

After a crop has been reaped, instead of allowing the land to grow up to weeds it is often well to sow some crop to cover the ground and keep them down.

Give every part of the farm clean cultivation. If the ground is kept well occupied with other crops, weeds will give much less trouble.

Keep meadows and roadsides well weeded.

THE POULTRY YARD.

By Aba.

Poultry Keeping and Management.

The advantages of poultry keeping are very great, as most of my readers know, and if one has the time to take good care of fowls, they can be made as profitable as any other business. It is, however, very foolish to suppose that immense profits could be made by keeping fowls, and those who have started with this idea in mind have very naturally met with disappointment and given up poultry-keeping in disgust.

In poultry-raising as in many other kinds of business, a strict attention to details is necessary in order to insure success. The poultry-keeper

must take an interest in his fowls; he must be on the look-out to see what they lack in the way of comfort, and supply that lack; he must be thoughtful for them. A thoughtless, careless person is less likely to succeed in this business than in many another.

There are few households, except in the most densely-populated parts of our towns where a greater or lesser number cannot be kept with advantage and profit. I do not advise my readers to keep fowls under conditions rendering life a misery to the poor creatures, and a discomfiture, if not a positive danger to the health of their owners as is sometimes attempted; but in connection with a great number of town houses, room can be contrived for a few.

Fowls in confinement require more care and attention than those that have their liberty, and in those cases overcrowding should be specially guarded against. In small runs the number of birds kept must be limited in accordance with the available space, but where they have an unlimited range a much greater number may be kept, and at a cheaper rate, as they find for themselves much necessary food when allowed to roam about, but even here overcrowding under the most favourable circumstances must be avoided for fear of bringing on contagious disease as chicken cholera, &c.

Perhaps the greatest blunder the ambitious poultry-raiser can make is trying to raise too many fowls. Because a farm contains a hundred acres, the owner may think that he cannot overstock it with poultry, and so try to raise from five hundred to one thousand fowls. Where fowls have unlimited range they will go quite a distance in search of insects. About a quarter of a mile, however, is the limit of their wanderings, and when fowls are left to their own inclination they will separate in flocks of perhaps a dozen to each flock. This should teach us a lesson. We can learn many lessons from nature, and in their natural state fowls never move in large numbers while foraging, and would not at any other time if they could have their own selection of roosting places. But the owner thinks to economize in space and material, and will crowd a hundred into one house, and then wonder why they get sick.

Poultry-raising on a large scale will not succeed from year to year on a small area. Even on a large farm each flock of twenty-five fowls should have its separate roosting-place. They will manage for themselves during the day if allowed their freedom. Plenty of range is absolutely necessary to the well-being of fowls, all the advice to townspeople to keep a few fowls to the contrary notwithstanding. Fowls may do well awhile in a cramped city cot, but time will prove that it cannot be successfully continued from year to year. Besides, the keeping of poultry in cities only adds much more impurity to the air where too much cleanliness cannot exist if we have any regard for human healthfulness.

HEREDITY AND SEXUALITY.

According to M. Kiener of Haute-Alsace, heredity influence is controlled by two factors—the parents whose characters are transmitted to the offspring, and the environment, which aids in moulding or modifying the latter. As an instance of the influence of environment is mentioned the difficulty of replacing a local race or breed by an imported one. The imported stock becomes gradually modified and assimilated in character to the local race, though by the exercise of care and selection on the part of the breeder the original characteristics may be preserved. It is inexpedient, thinks M. Kiener, to mate together large sires and small dams, whilst it is beyond question that the use of small sires upon large dams has yielded excellent results. Many examples are quoted to show that neither of the parents enjoy a monopoly in the transmission of characters. In other words the offspring may derive its peculiarities from either parent, or from both parents. Thirty years' observation has convinced M. Kiener that the milking propensity, for example, is quite as transmissible through the male as through the female line, and, in view of the large number of offspring of one bull as compared with those of one cow, he argues that the milking aptitude is preferably propagated through the male. He adds that bulls of good dairy character are distinguished by the possession of fairly developed teats. Ancestral influence is undeniable, though under what combination of circumstances it is most likely to manifest itself it is difficult to say. The influence of the male in close in-and-in breeding is of the highest importance: and many striking instances are given in proof of this statement. For the transmission of hereditary disease it is not necessary that more than one of the parents should be the medium. The experience and observations of many years has led M. Kiener to the conclusion that it will never come within the capacity of the breeder to control the sex of the offspring, though some consider that more than one circumstance can be made to rule the sex and cite instances in proof of their theories. The age of the parents does not appear to M. Kiener to exercise any influence on the sex, and he considers that the more robust parent does not necessarily determine the sex.

The progress of the study of Embryology has placed beyond doubt the circumstance that in the animal kingdom the bisexual or hermaphrodite condition is the usual and primitive state, the unisexual condition being the result of more or less suppression of the one kind of sexual apparatus in favour of the other, which consequently developes the more fully. The embryos of vertebrate animals are first hermaphrodite—a condition which is very commonly permanent among invertebrates, and is occasionally more or less so in the case of vertebrates. In plants hermaphroditism is the rule—the unisexual condition the exception.

If the proportions of the sexes at birth be taken as a standard, it is found that normally the two sexes about balance each other in case of the human species and the domesticated animals, though with a slight preponderance of males. Statistics of the European countries give an average of 105 boys to every 100 girls. According to the observations of M. Cornevin (Professor at the Veterinary School at Lyons) the ratios in the case of farm animals are:—Horses 101 males per 100 females, cattle 104·6 males, sheep 115·4, pigs 104·9. Change in the environment appears to be one of the most potent causes in the determination of sex, and, as regards the human race, observations on this point are easily made. In hot

countries to which white people have migrated there is a preponderance of girls at birth. Horses equally serve to afford evidence that, in an environment different from their native one, there is an excess of female births.

The results of the observations of M.M. Kiener and Cornevin, as given in their papers on this subject, and reproduced in the *Royal Agricultural Journal*, strongly support the statements given on their authority in this note.

GENERAL ITEMS.

Attention is being prominently called to an alleged cure for Pleuro-pneumonia, which has already been tried and found effective. This cure was discovered by a Mr. Dawson, who argued that as Pleuro was caused by a species of microbe infesting the lungs, and as paraffin oil was found very effective in destroying minute pests which infest vegetation, it might also be equally effective in destroying microbes in the lungs. Mr. Dawson solved the difficulty of getting the paraffin oil "sprayed" over the lungs by putting a small sponge saturated with oil into one nostril of the affected animal, and holding the other nostril tight, and at every inspiration of the beast he gave the sponge a squeeze. The plan proved quite successful, and in every case resulted in the cure of the animal. The system has been tied in a large number of cases in different localities and always proved a complete cure, the result being testified by veterinary authorities. The whole facts in connection with the discovery will be brought before Parliament shortly, so that this most simple and inexpensive cure may be fairly and thoroughly tested.

A new and enlarged edition of Miss Ormerod's work on insects, entitled "Injurious Insects and Methods of Prevention" has been lately published. The volume is tastefully got up, and is illustrated by a portrait of the distinguished anthoress whom one Agricultural Journal designates "the queen of Entomological Science." Simpkin, Marshall & Co. are the publishers, and the book is priced at five shillings.

Dr. Babcock, an American chemist, has discovered a new method of estimating the amount of fat in milk. The new plan consists in putting equal quantities of milk and sulphuric acid into a test bottle having a long narrow neck. The bottle is then placed on a wheel which revolves at the rate of six to eight hundred times per minute. In the course of six minutes the fat of the milk which has been set free by the acid will have risen to the top. Some hot water is then poured into the bottle, so as to fill it up to a certain point; and after other two minutes whirling at the same rate, the cream will have again risen to the top, and its percentage can be read on the graduated neck of the bottle.

A new college farm has been established in the north of Scotland where all the branches of agriculture will be taught—the instructors being all members of one family. These consist of Mr. Ledingham, senior, who will be assisted by his eldest son who studied at the Edinburgh University, and is at present a lecturer at the Tamworth College, his youngest son trained in America, and by his daughter who is an adept in dairying.

Paddy occupies an area of 1,272,100 acres this year in the Madras Presidency, a little under the normal area. Cotton is cultivated over 71,300 acres, Indigo 14,200, and Gingelly 339,200.

According to analyses made by Dr. Barry, Government Analyst at Bombay, buffalo's milk has 18·67 per cent total solids, that of the Indian cow 12·88, that of English cows 13·20. The fat in the milk of the three varieties of animals respectively, were, 7·78, 2·87, and 3·82 per cent. The difference was also borne out in the results of butter-making, and goes to show how valuable the buffalo is as a butter and *ghee* producing animal.

As to the soil for grapes, *Food, Home and Garden* says:—"The old idea that grapes thrive best on light land is mainly due to the fact that such soils are naturally dry. While a heavy clay is not best for the grape, it is no insuperable obstacle to success in vineyarding, provided it be thoroughly underdrained. In fact, grape growing is possible under a wider range of conditions and soil than is the case with any other crop. The one thing that the grape roots cannot abide is stagnant water. No matter if this dries out in midsummer, it is then past the power of the vine to regain lost time. Land thoroughly drained to the depth of three feet warms quickly and makes a difference in temperature of five to ten degrees or more at the time when the vine most needs warmth."

According to the *American Agriculturist*, a sandy loam is the best soil for sweet potatoes, and well-rotted stable manure the best fertilizer.

By reservation of forest-land and the restricting on cattle grazing the Madras Government thinks that it is doing its best to eliminate deteriorated cattle, and render the conditions of life easier for cattle of stronger growth. A fee is charged for each head of cattle admitted to the forest reserves.

According to the *Indian Agriculturist*, the study of elementary agriculture has been much attended to in primary schools in the Central Provinces of India during the past year. School gardens are to be established for the boys to learn the industry practically. Both these plans have formed part of the policy of the late Director of Agriculture in Ceylon in the appointment of Agricultural Instructors.

The leaves of *Daboisia Hopwoodii*, a shrub growing in Australia, which are chewed by the natives in the same way as tobacco is chewed, bid fair to be a rival to tobacco. The leaves of this tree contain an alkaloid piturine which is identical or closely allied to nicotine. At least it has been proved that the actions of nicotine and piturine are in every respect identical.

Erratum.—In October number, the title of first article should be "Liquid Manure."

SCHOOL NEWS.

Mr. H. W. Green, late Director of Public Instruction and the founder of the Colombo School of Agriculture, has been confirmed in the appointment, in which he has more than once acted, of Assistant Colonial Secretary; and Mr. Cull, late Principal of the Royal College, succeeds him as Director of Public Instruction. In spite of Mr. Green's translation to another department, where he will have more than enough to occupy his time and attention, we doubt not he will maintain his interest in the cause of agricultural education in Ceylon, and the success of the school with which his name will always be associated.

Mr. J. S. De Saram is back again in Colombo in the capacity of Commissioner of the Court of Requests, the duties of which he fulfilled with so great satisfaction on a previous occasion.

Mr. H. D. Juanis, who passed out of the school last year, has been appointed Agricultural Instructor of the unfortunate Walapane district, the condition of which the Assistant Government Agent of Nuwera Eliya is doing all he can to improve.

Among the subjects discussed at the Agricultural Improvement Society was the much written about "Need of Technical Education in Ceylon," the subject of a paper read by Mr. W. A. de Silva. At the last meeting five new members, unconnected with the school, were elected.

Mr. Jayasinghe, an old boy of the school, has settled down as a sugar-cane planter in the Southern Province. He has already planted up 100 acres, and intends opening about the same extent of land with the object of extending the cultivation of the cane.

The final examination for the Seniors, as well as the Junior class examination, comes off about the 15th of the month; the distribution of prizes and certificates will follow at the end of the month; and the long Christmas holidays begin from the 1st December.

THE

TROPICAL AGRICULTURIST

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ANALYSES OF TEA, TEA SOILS AND TEA MANURES.

MR. JOHN HUGHES analysed specimens of soils of a large proportion of the hill districts of Ceylon, in which tea is now grown, but with reference to their suitability for coffee culture, indicating the mechanical treatment and the nature of the manures best calculated to improve the soils and help our then staple product. But since Mr. Hughes was here on the requisition of the Planters' Association, tea has been grown in localities, such as the Kelani Valley, which were not even conceived of as suitable for coffee. Tea also flourishes in stiff and ferruginous soils, not so well adapted for coffee, and tea, being a leaf-producer and not cultivated for fruit as coffee was, is not so much benefited by the application of lime as coffee and coffee soils were. It seems to us, therefore, that not only ought our Planters' Association to respond readily to Mr. Hughes's offer to analyze specimens of Ceylon teas, but that the scope of the chemist's examination and report should be extended so as to include reports on the soils in which the teas are grown and indications of the nature and quantity of fertilizing matter necessary, or likely to improve the quantity and quality of the produce. More than two years ago the Agricultural and Horticultural Society of India formulated an exceedingly comprehensive scheme of dealing with teas, soils and manures, and also the technical details of the manufacture of tea. The proposed scheme originated in a letter from Messrs. Jardine, Skinner & Co. pointing out the very haphazard manner in which tea in India and Assam was manured. The letter was accompanied by specimens of oil cakes used on various estates (one of which, by the way, bore the elegant name of "Rose Kandy") and asked information as to the fertility of each as a leaf-stimulator. It was added that managers, as a rule, had little idea of the comparative manurial value of oil cakes, although a lakh of rupees and upwards was spent *annually* on oil cake in Cachar alone. On this letter the comment of the Secretary is :—

"The information which is required for basing an opinion on the merits of different oil-cakes as a manure for tea, does not appear to exist. This should include analysis of the soils on which the tea is grown, of tea leaf, of the manures accessible, and other points of the like nature, without which the scientific treatment of the subject is impossible. The Society, and indeed all who are interested in the great Tea industry, are therefore greatly indebted to Dr. Warden, who has expressed his willingness to make a set of the required analyses which, when tabulated, will show at a glance what the different soils require. The importance of the data which will thus be collected can hardly be over-estimated, for much of the information will be as useful to cultivators of sugar-cane, indigo, &c., as to Tea planters. Messrs. W. O. Bell-Irving and P. Playfair are appointed as sub-committee to give Dr. Warden such assistance as he may require."

At a meeting of the Indian Tea Association :—

"An unanimous opinion was expressed that Dr. Warden's report on Tea Manures and Tea Garden Soils would be likely to prove most instructive and valuable, and as such, sure to be much appreciated by all interested in tea growing. On receipt of details as to the manner, &c., in which the samples should be collected, the Tea Association will be only too pleased to do the needful. It is suggested that samples be sent from three or four representative gardens in each district, say Cachar, Sylhet, Assam and the Dooars, and that gardens possessing different descriptions of soil be selected. One garden to send, say black peaty bheel soil, another plateau mould, a third stiff soil, and a fourth a specimen of Teelah formation. Some idea should be given as to the amount of earth (surface and subsoil) required as a sample, and the depth at which the latter should be taken, also as to the quantity of oil-cake, bone-dust, cow-manure, &c., necessary for a fair test muster."

It will thus be seen that Indian Tea Gardens embrace all the varieties of soil which exist in Ceylon, although the terms "bheel" and "teelah" do not enter into our vocabulary, as descriptive respectively of swamp and hill land. Samples of soils and plants were actually sent to Dr. Warden, but the illness of members of his staff prevented the analyses, and details of the wider scheme were specified in the journal. The necessity for action was shown by the statement that in Cachar, Assam, and Sylhet there were many "concerns" still of the highest class and remunerative with a yield of from 4 to 6 maunds (320 to 480lb.) per acre; but since gardens were being opened out which yielded 6 to 8 maunds (480 to 640 lb.), the old estates, if not

renovated would fall back into the third or fourth class. The proposal therefore was that

"A competent chemist should be employed for the purpose of making the investigations indicated above, viz., the analysis of the tea plant, the root, stem, branches, leaves and seed; the soils on which the plant is grown and the manures, both such as may be available on the spot, and those it is possible to transport with sufficient economy to make their use practicable. Linked with the enquiry as to the fertility of soils would be questions relating to the treatment of the tea plant, and of the leaf in the process of manufacture, points on which most useful information may be obtainable by careful scientific enquiry. As for example, the causes which tend to variations of quality in the teas produced, the chemical changes which take place in the leaf during the process of manufacture, and a number of similar points which if they cannot be dealt with chemically may, when a full record of all local circumstances is available, be referred to the leading authorities in different departments in Europe."

It was resolved that a competent chemist should be engaged for the purposes indicated for a period of at least two years; that the results, as obtained should be published; that R10,000 should be guaranteed by the Indian Tea Association; that portions of the necessary expenditure should be recouped by fees levied for special reports on soils of individual gardens and soils submitted for analysis. There are other details of minor importance and the memorandum concludes as follows:—

"At present the tea industry is regulated by more or less empirical methods; the precise conditions which influence the commercial value of the teas are practically unrecognised. A high priced tea and a low priced one, as far as is at present known, are chemically indistinguishable. The tea plant can be made to yield a larger crop by the return to the soil of certain principles abstracted by the leaf, and which is at present given back by the indiscriminate use of manures, while those which influence the quality of the leaf are, from a chemical point of view, an unknown factor. There are general rules regarding the restoration to the soil of constituents abstracted which are as applicable to the tea plant as to any other crop, and the systematic application of which will most certainly improve the yield. But although it cannot with certainty be predicted that any special rules will be deduced as an outcome of the enquiry, the application of which will certainly improve the quality of tea, yet there is every reason to believe that general deductions will be arrived at which will indicate to some extent the system which should be adopted to this end."

The memorandum is dated Sept. 1889, but up till now, we have not seen in the proceedings of the Society that the Indian Tea Association has taken any more active steps to carry out the scheme, than our own Ceylon Planters' Association has done in the case of Mr. Hughes's proposal. Mr. Hughes is now well enough known in Ceylon to justify us in saying that no better qualified chemist could be chosen to carry out analyses and experiments such as are contemplated in the Indian memorandum.

Our planters know generally that tea requires more nitrogenous manures than coffee did. That no better fertilizer could be used than cattle manure, provided it were easily obtainable from extraneous sources, or if the keeping of cattle on estates, largely for the sake of their manure could be made to pay. We also know that no better oil-cake can be used to supply nitrogen largely and potash in an appreciable degree than white castor cake, while coconut poonac is good, but not so valuable as a fertilizer, especially where wild pigs and similar animals abound. We know that by a very large number of authorities it is held that to supply tea with the desiderated proportions of nitrogen, potash and phosphate of lime, a perfect combination is that of white castor cake and bones broken small. If the latter are steamed so much the better, perhaps. But so highly nitrogenous a substance as fish must be valuable, if only its effects are lasting. Kainit, too, might be found valuable. In a recent experiment fish manure alone put luxuriant leaf on the tea bushes and no blossom, while fish manure with an admixture of bones, stimulated blossom (which is undesirable,) as well as leaf. A small quantity of super-phosphate added to the fish would probably have been preferable. Such questions and others regarding manures, in connection with knowledge of the constituents of the tea plant and the soil in which it grows, a competent chemist could settle. And surely it is more than probable that such a man as Mr. Hughes, watching, repeating, and experimenting on all the processes of the manufacture of the leaf, under different circumstances of elevation and weather and of the leaf itself as to degrees of withering, rolling, fermentation, roasting, &c., would be able to help planters to obtain uniformly those good results, which at present are obtained only occasionally. We believe, therefore, that a portion of the funds of the Association, with, perhaps some help from Government, would be well spent in securing the services of Mr. Hughes, or some other competent chemist, if that gentleman cannot accept the mission, to conduct in different districts of Ceylon, and on a series of typical plantations and in their factories, a series of experiments in cultivation, the application of manures, and the manufacture of the gathered leaf, such as we have indicated in quoting and commenting on the comprehensive Indian Memorandum. We submit the question for the seriou consideration of the producers of tea in our island. Our teas have a high character for their fine quality. Our efforts ought to be directed to sustaining and even improving the character of what is now the staple product of Ceylon.

RECENT GEMMING FINDS.

Several valuable gems have recently been found in Rakwana and the Morawak Korale, which are likely to have an appreciable effect on the market, especially amongst London capitalists. *Apropos* of a para. in our contemporary the "Times" yesterday headed "Gemming in Morawak Korale," which says:—"We are told that a cat's-eye was recently discovered on Rangwelltenne which has just been sold for R12,000,"—we are informed that it was not found on Rangwelltenne, the mining rights of which belong to the Ceylon Gemming and Mining Co., but it was found in the Morowak Korale, and Rangwelltenne is in Rakwana. This catseye was sold in Colombo three days ago to a Moorman for the sum named. An experienced man who has had an opportunity of inspecting the stone says it is one of the finest that has been found of recent years.

Another very fine stone of 26 carats. was recently found on Knowhill estate, adjoining the Ceylon Gemming and Mining Syndicate's estate, Golden Grove.

THE HARDY WHITE PASSION-FLOWERS.—Messrs Fuller, Courtenay Nursery, Newton Abbot, write to protest against a doubt raised by a correspondent as to the correctness of the statement that the plant in question originated in their nursery as a seedling from P. cœrulea. Although the plant was first described in these columns, we were of course dependent upon others for a correct statement as to its history. Messrs. Fuller say they raised the plant, and there is, so far as we know, no reason whatever to doubt their accuracy; but, if it be a seedling, other people may have raised it before, and others may raise it again. —*Gardeners' Chronicle.*

REGULATIONS FOR LAND SALES. IN CEYLON.

A new set of regulations for sale of unreserved Crown lands is published in the last *Gazette* and will come into operation from the 1st proximo. They are much the same as those given in our latest "Handbook and Directory" with the exception of a few amendments; while several new clauses have been added to them. Clauses 1, 2, 12 and 13, and the last part of clause 4 commencing from "For the opening" &c., and that of clause 9, from "and the amount of stamp duty chargeable" &c., have been expunged, and clause 11 has been made to read "On receipt of the purchase money in full, the Government Agent will apply to the *Colonial Secretary* for a grant in duplicate," &c. In the table of fees the progressive increase of R40 per 100 acres will in future be for lots between 2,000 and 6,000 acres and not 5,000 acres as hitherto. The following are the new clauses referred to:—

As a general rule, all unreserved Crown lands will be sold by auction, and at a price not less than 10 rupees per acre.

Sales of unreserved Crown land are classified as follows:—

(*a*) Those of forest, jungle, or patana not hitherto cultivated.

(*b*) Those of land already occupied, but the possession of which the occupants desire to regularise.

(*c*) Those of land which the occupants fail in acquiring, or that have been seized in default of payment of tax.

Under class (*a*) fall:—

(1) Land sales initiated by the Government to advance the progress of agricultural or planting enterprise.

(2) Lands the sale of which is applied for by parties desirous of adding to existing holdings or of possessing land in a district of their own selection.

To class (*b*) belong:—

(3) Lands occupied originally without deeds of title and improved for a period of less than 5 years, but sold to the occupant on payment of the appraised value.

(4) Lands occupied originally without deeds of title and improved for a period of more than 5 years and less than 10 years, but sold to the occupant at the rate of 10 rupees per acre, and lands held on permit or license continuously for not less than 2 years.

While under class (*c*) come:—

(5) All lands under (3) and (4) which the occupants fail to acquire under the conditions therein stated, besides those seized in default of payment of tax.

When lands exposed for sale under rule 2 (*a*) and (*b*) exceed 50 acres in extent, or in cases where small contiguous blocks aggregate 50 acres or more, the same shall be advertised in the *Gazette*, with the name of the applicant, if any; and these and other advertisements may be inserted, as at present, by the Surveyor-General in the Local, Indian, or Home papers, under such limitations as the Government may from time to time appoint.

Before any block of unreserved forest, mukalana, lands adjoining forests and lands adjoining river or streams, or chena over twenty years' growth can be brought forward for sale, the opinion of the Conservator of Forests shall be taken as to the desirability or otherwise of the alienation before publication of intended sale in the *Gazette*; and in cases where the block exceeds 50 acres in extent, a report on the land, with explanatory sketch, shall further be submitted to His Excellency the Governor, showing its situation, altitude, proximity to existing estates, drainage of watershed, extent of forest reserves in the neighbourhood, and probable existence of minerals or gems.

Land over 5,000 ft. elevation shall not be alienated, and land of any elevation whatsoever, which, in the opinion of competent authority, from its position upon or at the side of a ridge, or at the source of streams, or on the banks of streams, or for any other cause, should not be alienated, may be permanently reserved and marked in the record maps "Not to be sold."

When any block or lot of land has been reserved as above by order of Government, such block or lot shall not be brought forward for sale at any future time unless the conditions under which it was reserved have in the opinion of the Governor ceased to exist.

Reservations on rivers or streams should be carefully demarcated and preserved, more especially when there is dependent paddy cultivation below; while in the case of estates bordering on villages, suitable reservations round the village should be allowed for the wants of the inhabitants in forest produce, grazing, and so forth. The land abutting on paddy fields should, as a general rule, be reserved for the villagers.

Rules for the Guidance of the Government Agents and Surveyor-General in bringing forward unreserved Crown Lands for sale.

In respect to land sales under 2 (*a*) of the Regulations for Land Sales dated September 13th, 1890, the Government Agents, under instructions from Government, will make arrangements for bringing forward for sales suitable blocks of land in such district or districts as the Government may deem expedient. With regard to sales under 2 (*b*) and (*c*), the necessary arrangements will devolve upon the Government Agents in conjunction with the Surveyor-General.

When Crown land exposed for sale at upset price has any standing timber or other forest produce upon it, it shall be optional with the crown on its own behalf to fell and remove the same, or to sell all or part of such standing timber and produce to the purchaser, at a valuation to be made by the Forest Department.

Government Agents and officers of the Survey Department are enjoined, when dealing with applications, to be particularly on their guard against any attempt on the part of applicants to select the pick of the land in separate blocks, or to obtain allotments in such positions as to detract from the value of neighbouring unsold land, and by rendering this latter inaccessible in the future to other applicants, to obtain command of the market. To prevent these attempted deteriorations of crown property, frontage to routes of communication (roads, rivers, &c.) should be evenly distributed, means of access to all lots provided by suitable road reservations, and the land blocked out as the configuration of the ground and not as the desire of the applicant dictates.

Forest and woodland being of vital importance to the interests of the community, whether for the supply of material wants, for grazing, for assuring the water supply, for maintaining the balance of bird and insect life, or for preserving the beauty of the landscape, the Surveyor-General and Government Agents are held responsible that in bringing forward lands for sale due attention is paid to these important considerations.

Sales of land under rule 2 (*a*) will be held from time to time at such place and on such date as the Government may by Notification in the *Government Gazette* appoint. Sales under rule 2 (*b*) and (*c*) will be held when practicable at the different kachcheries twice a month, after six weeks' advertisement by Notification in the *Government Gazette*, and care will be taken to prevent the days of sale in the several Provinces from clashing with each other.

Some Inferior Madras Tobaccos.—In May last the Commissioner of Agriculture forwarded to Messrs. Corry, Soper, Fowler & Co, of London, for report, samples of certain tobaccos grown in this Presidency. Of these tobacco grown in Chebrole, Kistna District and Cudicota, Cuddapah District, are reported to be of no value and not worth sending to Europe. That grown at Medur, in the Kistna District, the firm offers to buy at 2d per pound in London, and the tobacco from Pannatola in Jammalamadugu in Cuddapah District at 1¾d delivered at London. The tobacco growers in these districts are not likely to accept the offer of Messrs. Corry, Soper, Fowler & Co., as the rates offered by them are lower than the local selling prices of the leaf.—*Pioneer*, Oct. 12th.

LETTERS FROM JAMAICA: NO. 32.

WEATHER—COFEE CROPS—PRICES FOR COFFEE IN LONDON—CEYLON VERSUS JAMAICA—LABOUR SUPPLY—THE FORTHCOMING EXHIBITION—RAILWAY EXTENSION.

Blue Mountain District, for Packet of Aug. 12th:

DEAR SIR,—It is quite six months since I addressed you: the only excuse I can make is that I have not had sufficient materials for a letter.

First, as to weather among these Blue Mountain hills: we had during the five first months of the year, more rain than we needed—not that it was heavy, but continuous showery weather with very few intervening fine days, so that it was impossible for us to do much coffee preparation till June, for as you know we have to prepare our coffee on the estate ready for shipment. On the other hand other parts of the island, even those below us and not far off as the crow flies, have suffered from drought, and I fear it will cause light and short crops in the lowlying districts of the island which are mostly owned by *settlers*, and would in Ceylon be termed native coffee. My own coffee in the high fields in exposed places suffered very much from the cold cutting N.-E. winds, and the constant showers; the ends of the branches turned black and had quite a frostbitten appearance. It was only in the highest coffee in Ceylon, and in hollows, that I have seen the like. It is evident that 4,000 should be the limit at which Jamaica coffee should be planted; 3,000 feet is by far the best height, as we are so much more to the northward, and have quite a marked winter. I am glad to say that most of my neighbours had good crops and did very well; on old Jamaica properties crops seem to alternate: after a large yield. One must look for a shorter one the coming year.

As to prices, Ceylon appears to have done better in London than Jamaica in Liverpool. I saw in the *T. A.* list that one Ceylon property had touched 132s and 133s: this is what our best marks usually obtain for number one quality. I fancy the highest price is given in London for "peaberry," but this is seldom separated in Jamaica, as the sizers do not seem to be perforated to extract the peaberry: my sizer, one of the old fine sort, does not. Some little time ago I noticed in one of the *Tropical Agriculturists* a letter from a Jamaica planter, who was evidently not a *Blue Mountain* but a *Manchester* coffee planter. In one of my previous letters *No. 22*, I described Manchester coffee, and how totally it differed from ours, being grown under the shade of trumpet trees, without which shade it strangely cannot thrive: the land is flat, the soil red, as in parts of Devonshire; and there is a subsoil of marl which is fatal to the coffee tree if the roots reach as far. On the other hand our hills are very steep, suitable land has to be picked out, and the conditions far more favourable than those of Udapussellawa and Haputale in Ceylon, but we have no open patanas, the sea is only some ten miles off, and the hills altogether are very much more scarped and abrupt.

As regards Immigration, it is to be again resorted to, but not before an attempt has been made to obtain indentured labour *locally*, by a system of yearly contracts, the employer to pay Government the sum £2 10s for each labourer so supplied, over and above his daily wages. £2 of this sum is to be handed to the labourer as a premium at the end of his contract. I am not of opinion that this plan will meet with much success, and it certainly will not be popular amongst the planters and other employers of labour, who will not care to pay the £2 10s extra yearly for labour procured locally. In the case of East Indian coolies it is different, as it is natural the planter should bear the principal cost of importation. Neither do I think the 3s 4d extra a month will induce our local Jamaican to bind himself to any such arrangement, as he loves his liberty too dearly, and might fancy it was a dodge to introduce a species of slavery. As to the local coolies who have served their time, a few might be induced to tender for the sake of the £2 bonus, but they mostly prefer to become keepers of rum and other shops. As to such coolies who are free and are now working on some of the sugar estates, this new plan ought to suit them, as by binding themselves for a year they would get two pounds a year in addition to their present wages. It would in my opinion be best to send for coolies at once, and if they could be got from the Madras Presidency instead of Bengal, a much better working man and physically stronger, would be obtained, some perhaps with experience of Ceylon or Mauritius.

Our Exhibition buildings are, from the account I read in the newspapers, progressing satisfactorily and there is the hope that they will be all but completed by the middle of January. The Governor has been visiting various parts of the island and stirring up the people to action. The consequence is that two or three local exhibitions in other towns in the island are to be held so that the people will get a good idea of what the large Exhibition is intended for. That the Exhibition will draw attention to Jamaica and her products, and make her to be better known all over the world, there is no doubt; but no one seems to expect a financial success, as our own population is not sufficient to make it pay, the expense of travelling will deter many from visiting it, and it is too long and expensive a trip to expect many to come from Europe where they can see very much finer exhibitions; but no doubt it may induce many Americans and West Indians to visit us, if sufficient accommodation is available. With this view a law has been passed to induce people to build hotels without delay, Government guaranteeing 3 per cent interest on sums so legally invested, so it is hoped sufficient accommodation may be available by the time the Exhibition opens, towards the end of January. I hear also that the railway is being pushed on, and that the first 12 miles will be ready by contract time, *i.e.*, one year after commencement; this is the section of main line to Montago Bay; the branch to Port Antonio has not yet been commenced. W. S.

GEMS GALORE!

The big catseye found in the Morawak Korale has been purchased by the same Moorman dealer who had collected together the fine gems recently described in our columns. His offer of R16,000 for this latest find has been accepted and the Moorman has started off for Galle to take over this precious stone.—The Rangwelletenne sapphire reported to us as worth £100, is now being cut under Mr. Siedle's care and is pronounced worth at least £200. A few more of such stones will make a handsome dividend for the "Gemming and Mining Company of Ceylon Limited" apart from their other returns.

THE EXPERIMENT which has been made to cultivate tea in South Africa has not been successful. The Natal Tea Company has decided to perform a "happy despatch" by voluntary liquidation. The first subscription of £3,000, it appears, is all spent, while the tea produced last year did not pay the working expenses. The chairman's explanation was the familiar complaint—insufficient capital.—*L. and C. Express.*

CEYLON TEA: HOW TREATED IN LONDON TEA WAREHOUSES.

A well-known proprietary planter favors us with the following account of his experience in this matter :—

Oct. 16th.—I can't agree that in the "great Bonded Warehouses," our teas are treated in a sensible fashion! for during my last "holiday" at home, I spared no pains in watching the treatment tea received in London. In the "Bonded Warehouses" referred to, *each* and *every* chest and ½ chest is ripped open; then a man comes along with a knife and slits the tea lead, right along the full length of every chest; a handful is then taken from each chest and submitted for examination to the selling brokers' representative, who decides whether or not the teas are to pass as "Factory bulked"; if they are not so passed, out on to the floor it all goes, to be bulked by the warehousemen. Navvies in fact; who turn it over and over with iron showels, when sufficiently bulked it is most roughly repacked, and stamped down by the navvies in their hobnailed boots. From the time the lead is first slit open, days may elapse and do elapse, before any steps are taken to in any way protect the teas from the air. One time when I was being shewn round, I noticed a strong smell of coffee roasting, which was being carried on close by; large quantities of tea were at the same time being bulked! So much for the sensible fashion in which our teas are treated in the "Great Bonded Warehouses"!

HILLCOUNTRY PLANTING REPORT.

THE WEATHER—A VISIT FROM MR. NOCK—THE BATTLE OF THE WATTLES—ACACIAS AND EUCALYPTS—OTHER TIMBER AND SHADE TREES—GRAND VIEWS—THE TREE TOMATO—HINDRANCES TO PROGRESS ON THE RAILWAY EXTENSION—ANOTHER CALM DAY.

NANUOYA, Oct. 18th.

Yesterday was a beautiful day, and there was a gentle deposit of rain during the night which is indicated this morning by the rain-gauge as equal to 16 cents. The fears of those who are planting have been thus dissipated for the time. As a consequence, no doubt, of the rain falling on ground heated by yesterday's strong sunshine, there are masses of white vapour on the mountains, but the sun is shining brightly down into the valley. "Every leaf is at rest," and there is the promise of another fine day. [Which has been amply fulfilled.]

Yesterday we had a very interesting visit from Mr. Nock of Hakgala, who came for the purpose of obtaining information and specimens to enable Dr. Trimen to identify some of the many exotic trees growing here and especially to clear up, if possible, the confusion existing regarding the numerous and variable species of Australian acacias or wattles. About *A. armata*, with its thorn-like leaves and its primrose-coloured, catkin-like blossoms, there is no question: it is simply ornamental. The difficulty has been about *A. decurrens*, with its two varieties (at least), and *A. dealbata*. We are about certain that we have the best varieties of both, grand trees of a dozen years' growth on a quartzy ridge. What we take to be *A. decurrens*, and what Mr. Nock thought was its superior variety *mollissima*, agrees in foliage with Mr. Kellow's specimen sent to us, its warmer golden colouring of flush in ours being probably due to its more mature age. Indeed our trees look as if they had reached full maturity, the large quantity of gum they secreted having led to considerable decomposition of the bark and the formation of a series of curious round knobs, some of which were detached and handed to Mr. Nock, while others, being connected with the wood of the trees, could not be removed. The specimens of both trees show great growth for their age, but their mode of growth differs exceedingly. What we take to be *A. decurrens* has grown umbrageously, throwing out a large number of thick branches; so that, as Mr. Nock remarked, a tree, if cut down, would yield a large quantity of "cord-wood,"—that is timber for fuel. Its mode of growth certainly seems to indicate that it is more suitable for firewood than timber for house building or other purposes, although the trunk and even some of the enormous horizontal branches would yield planks and deals of good size. What, from its silvery foliage, we take to be *A. dealbata* grows into straight tall handsome trees, with a moderate array of branches, which are not spreading, but assume more of the semi-perpendicular form. There can be no question as to this being the finer tree of the two, while, from the absence of gummy and other secretions, it shows no sign of having reached anything like the termination of its fresh and growing existence. The sending up of suckers by this tree seems to depend on circumstances. Until yesterday we called our tree "the *A. dealbata* which does not send up suckers." But we found that one specimen had sent its roots out into loose soil and that from these roots suckers were springing. For yielding a large supply of firewood, it will probably be advisable to encourage rather than suppress the tendency of *A. dealbata* to send up suckers. Mr. Nock took away specimens of other acacias, as well as of the numerous varieties of eucalypts growing on Abbotsford. One of the latter, of exceeding rapid growth, closely resembles *A. decurrens* in its branching habit, some of the branches, indeed, vying with the trunk in size. The blue gum, *Eucalyptus globulus*, of which we have many, are not trees to be proud of, except in specially favourable localities; but the red and white gums grow well. *E. robusta* is here as in all these districts a very luxuriant grower, while, rather to our surprise, one of our best and quickest growing trees is the famous jarrah tree, *E. marginata*. Mr. Nock admired our truly noble specimens of *Albizzia moluccana*, so prized in Java as a shade tree. When covered with snow-white flowers, as some of ours have been, these trees are beautiful objects. But they are brittle and the timber poor as firewood, although, doubtless, it would prove suitable for tea chests. Grevilleas do well here up to close on 6,000 feet, but Nuwara Eliya seems to be beyond their limit. A few planted near the bund in good soil, have grown fairly well, but their tops were broken by wind. Mr. Nock much admired our *syncarpias*. As one of the best firewoods we have large numbers of different species of casuarinas, and for the same purpose we are growing the luxuriant bushy frenelas, trees which for shelter and shade purposes could scarcely be surpassed. Mr. Nock was in great admiration of our young plantations, in which, wattles, casuarinas, eucalypts and cryptomerias are conspicuous, while other trees are being tried, as well as with the large number of older trees scattered about the estate. We have now found that, with the exception of wattles, casuarinas and above all bamboos, trees grown amongst tea do little or no harm to the principal culture. Indeed we rather think that at our higher elevations the shelter of trees is useful. Never having been here before, Mr. Nock was enchanted with our grand and extensive views, as of mountains, valleys and patanas, terrace after terrace, between 4,600 and nearly 6,000 feet altitude, was attained near our beautiful lakelet, which supplies water for working the

"tandem wheels" at the factory. *En passant* I must express my admiration of the grand leaf, as well as the fine fruit, of the tree tomato. A leaf from plants grown on a trellis at 4,700 feet measured 21 inches by 15.

INDIAN TEA NOTES.

Dehra Dun, Sept. 30th.—On the 23rd we had 1·25 inches of rain, and since then it has been cloudy but no rain. The rain has done a lot of good.

Luckimpore, Sept. 22nd.—Rainfall for the week 4·71 inches. Mosquito blight very prevalent and general in the district, and it is a struggle for most gardens to keep up with last year. Increases on last year are diminishing slowly with little hope of pulling up again. The mornings and evenings look very much like an early close. Rainfall to date 142·98 inches.

Dooars, Dam Dim, Oct. 4th. The weather during the past week has been very unsettled and varying. Showers have fallen at night, and days are fairly warm. Snow fell on the lower range of Bhootan hills, which is uncommon for this time of year. Rainfall from 20 to 30 inches ahead of last year on same date, Outturns going further behind, but quality showing some improvement.—*Indian Planters' Gazette.*

NOTES ON PRODUCE AND FINANCE.

THE DEALERS AND THE DUTY.—The tea dealers have carried their point about the proposal to weigh tea to the half pound, and the Customs authorities will not insist, at least for the present, on any departure from the old plan. All over the country tea dealers had protested against the new order, and now that it is temporarily rescinded it will probably never be heard of again. The tea trade of the country is a powerful interest, and the Government cannot afford to add to the ranks of its enemies.

TEA AT THIRTY SHILLINGS PER LB.—Commenting on the remarkable price paid for some small boxes of Ceylon tea, as recorded by our "Commissioner in the 'Lane,'" last week, the *Grocer* says:—"One of the rarest and most curious kinds of tea that has been imported into this country in modern times was offered by auction in Mincing Lane on Tuesday last, when a small parcel of three boxes Ceylon, weighing only five pounds each, very showy, and described as "choicest golden-tipped flowery Pekoe," fetched the astonishingly high price of thirty shillings and sixpence (30s 6d) per pound. Just fancy seeing tea marked up at such an extravagant figure in a grocer's shop window! and the effect, we should think, would be to scare away customers, instead of inviting them to buy, for no one surely but some magnate or a crowned head would ever think of drinking tea that cost so much money, as, at the rate of nearly twenty-three pence (1s 11d) per ounce, it would be dearer than many bottled wines of the finest vintages. The estate or garden in Ceylon where the said tea was grown is named 'Hethersett,' and it is probable that the proprietors and owners there may be stimulated to fresh exertions to produce a larger quantity of the same sort, and then perhaps further consignments may be sent forward for the approval of those who pride themselves in being connoisseurs in drinking tea of the greatest excellence."

PUSHING THE SALE OF TEA.—A correspondent of *The Times* writes: "Whilst my wife was entertaining a number of friends at her afternoon tea, the servant announced 'Mr. ——,' who walked into the room, and, seeing a lady without a bonnet, asked her to patronise his tea, at the same time offering her circulars of 'The —— Company,' Tower Hill. The lady happened to be a visitor staying in the house. My wife had some difficulty in getting the intruding tout to withdraw. Publicity may, perhaps, tend to abate a nuisance of this offensive kind. I may mention that twice within the past twelve months my privacy has been intruded upon by touts. They came to the door in broughams and took the servant in by asking for me by name. My servants are pretty wide-awake now, but 'Mr. ——' managed on this occasion to elude the vigilance of the one who answered his double knock and ring."

HOP TEA.—Mr. Patrick Macgregor, late of Assam, is, as will be seen from a reference to another column, showing the men of Kent how to make hop tea. Although less hopeful than the promoters of this new industry as to its success we feel sure that Mr. Macgregor will bring the necessary energy to bear upon the new undertaking, and he may succeed in making hop tea popular.

TEA LABELS IN RUSSIA.—We referred recently to the quantity of adulterated tea sold in Russia. In order to protect the public and to assist those who wish to sell pure tea, the Government now permit tea dealers in Russia to sell their wares under Government labels, which are placed on packets of tea of various weights, by persons employed by the Government for that purpose, and who work under the control of official inspectors. The cost of labelling, which is small, is defrayed out of the money realised by the sale of the labels. The labelling is not imperative, but most of the tea merchants in the retail trade have recourse to this epedient to increase their sales.

COFFEE AND ITS ADULTERATION.—Public analysts complain with justice that there is no unanimity on the magisterial bench on the important subject of food and drug adulteration. One analyst finds that 57 out of every 100 samples of coffee he examined contain on an average 40 per cent. of chicory. On this point the difficulty of the magistrates is not to be minimised. Some people prefer a mixture of coffee and chicory, and if anywhere in the packet carried away by the customer the words "sold as a mixture" are found, one magistrate may hesitate to inflict a fine. Another, bearing in mind that coffee is worth at least sixteen pence a pound while chicory costs but four pence, will hold that the purchaser is not bound to stay in the shop and read the printed wrappers of each article he buys. If he asks for coffee and gets coffee and chicory the seller is punished. The more lenient magistrate, it is complained, will make no distinction between the case of a man whose packets are one-half chicory and another who only makes them one-third chicory and gives two-thirds of the weight in genuine coffee. Some uniformity of practice among magistrates on this subject would tend to minimise confusion.

THE INDIAN GOLD MINE BOOM.—By way of preparing people on this side the *Financial News* has the following:—"Private advices from Calcutta report that a gold fever has broken out in India, and that great preparations are making for the floating of companies in England. The Western Bengal Prospecting Company has been got up by Mr. G. Tosco Peppe, one of the most active promoters, who will shortly offer it here for £200,000, in return for which the English purchasers are to have the right to prospect 1,500 square miles of territory. The Souspet Company has been floated in Bengal, and has begun buying up adjoining properties, including the Chota Nagpore. Messrs. Ogilvie, Gillanders, and Co. are credited with the intention of introducing the Kapurgadilh Gold Mines on this market, and Messrs. Jardine, Skinner, and Co. are reported to have acquired the Patcom for a London syndicate. Other properties, of more or less value, destined for English investors are the Kharsawan, the Pat Pat, and the Tamar, of which more anon."

BURMAH RUBY MINES CO.—The company, for which there was such a rush for shares, was floated in February, 1889, and was formed to acquire a concession granted by the Secretary of State in Council of India for the Ruby Mines of Burmah. The grant was fixed for seven years only, from November 1889 (with certain provisions for renewal), at a rent equal to about £28,000 per annum, the Government, in addition, receiving one-sixth of the net profits. The price paid for the transfer of the grant was £55,000 in cash. No dividend has as yet been paid. The market quotation, which carried a good premium all last year, and retained some of it during the first months of this, now shows a discount.—*H. & C. Mail.*

CEYLON AND CHINA TEA IN RUSSIA.

The decline in the export of tea from China to Great Britain has been partially counterbalanced by an increase in the export to Russia, a circumstance from which the apologists for China's suicidal policy in regard to her principal article of trade have derived more consolation than is fairly warranted. It is only a question of time how soon China tea will be relegated to the same relative position in the Russian market that it occupies in the English market. Russian buyers will find out sooner or later that they can get tea of equal quality at much cheaper prices. Ceylon planters are taking active steps to bring this fact prominently before the subjects of the Czar, and when they have succeeded Russian tea drinkers will not be slow to take advantage of it. At present the Ceylon Planters' Association has a Commissioner in Russia, and an interesting letter from him giving particulars regarding his mission was recently published in the Ceylon papers. From St. Petersburg he writes that from all the information he has been able to collect since his arrival there is a great future before Ceylon tea in Russia, where it is already pretty well-known and appreciated for its purity and cleanliness of manufacture. It is not the fact, he says, that the teas are found too strong and dark in infusion, as the Russians like a somewhat strong tea and do not at all object to a dark reddsih colour, but what they do not like, at least in St. Petersburg, is the sweet raspberry taste given to Ceylon teas by the water of the Neva. Whether any alteration may take place in the popular taste in this respect or whether the objection can be removed by some alteration in the manufacture of the tea remains to be seen, but at all events all the dealers, both wholesale and retail, were desirous of seeing and tosting the samples. These samples were to be distributed with a short circular printed in the English, German, French, and Russian languages. From St. Petersburg the Commissioner proposed to go to Moscow and Nijni Novgorod, to push Ceylon tea there.

But to secure success in Russia "tips" are necessary. "To get the key of everything," he says, "of every door of success in business or otherwise, you must tip everybody, from the lowest moujik to the most influential swell; and it is only by doing so that we shall introduce our Ceylon teas in this country. I have been told that a Chinaman, last year, spent something over 30,000 roubles in opening a large tea retail warehouse on the Newsci Prospect (the largest and most central street here); he has now made his fortune. The Brazil Coffee Company spent three years ago, roubles 50,000 to introduce their coffee here, and are now doing all over Russia, a very considerable and paying business, as their coffee is known to and drunk by almost everybody. Another Coffee Company of the same kind, who would not spend the necessary currency in tips or otherwise and tried to do without it, did nothing at all and failed." Presumably the Ceylon Tea Fund will not let a small expenditure for "tips" stand in the way of their tea, whatever opinion the members may entertain individually as to the morality of tipping in the abstract.

The prospect for China tea seems bad enough from whatever point of view it is looked at, and when we see the Ceylon planters making such vigorous efforts to wrest from it another of its chief markets one is compelled to believe that, with all their advantages, they are bound in the long run to succeed. It is interesting to note the enterprise of the Chinaman mentioned above, who opened a retail tea warehouse in St. Petersburg and succeeded so well in his venture. But, granting there were many like him amongst his countrymen, what possible chance can China tea have so long as the Government continue to handicap it with heavy export duties whilst its competitors can be exported free or, as in the case of Japan, on payment of a very mild duty? The total extinction of the China tea trade is merely a question of time if the Peking Government continues to pursue its present policy. The decline in the total export of tea from China this season up to date is about twelve million pounds. Ceylon, on the other hand, has gained about nine million pounds; India, we believe, will show a still larger increase; and in Japan also there has been a forward movement. If China would adopt a bold policy and sacrifice the revenue derived from tea the export would immediately begin to expand and a good deal if not the whole of the lost ground would be recovered. There is just a possibility of the demand for China tea being revived by another cause, which, however, is not a pleasant one to think of. There has lately been some talk of the plant in India being attacked by blight. So far this does not seem to have done any great damage, but as high culture often seems to invite disease from which plants have been free in their more natural state the progress of the tea industry in India and Ceylon may in time be arrested by blight, as was the case with coffee cultivation in Ceylon.—*Hong Kong Daily Press.*

CINNAMON CHIPS.

While Mr. Jardine was in Colombo today our representative took the opportunity of asking him whether the combination entered into about twelve months ago by cinnamon growers as regards cinnamon chips was receiving general observance, and whether the agreement had had the desired effect. Mr. Jardine replied to the effect that he was constantly receiving letters stating that the combination was not being adhered to by certain growers, but his correspondents would not mention names, and expected him to act the part of detective and then take upon himself the risk of exposing the delinquents. This Mr. Jardine does not feel himself called upon to do, and notwithstanding the letters he has received he himself is convinced that three-fourths of the cinnamon growers who entered into the combination have honourably adhered to it. But it is a strange and puzzling fact that though all these men agreed twelve months ago not to make chips the exports up to date show no decrease. As the price of cinnamon has gone up considerably so has the price of chips advanced to nearly double what it was a year ago. This may perhaps be regarded by some growers as an opportunity too good to be lost, and the question is—have any of the big growers retired to some distant part of the jungle for the purpose of making chips "on the quiet"? The failure of the rain which is generally characteristic of the south-west monsoon in the cinnamon districts has had a bad effect upon cinnamon generally, and rain is very much wanted for the November crop.

Raising Tobacco in California is by no means an experiment, It can be grown very successfully over a wide range, but the process of curing has been a stumbling block in the way of success as a business venture. It was thought some years ago that the Culp process was a solution of the difficulty, and quite a large amount of tobacco was raised in Pacheco, and worked up for the market in accordance with that formula, but the manufactured article did not find favor with consumers and the business died completely out wherever it had been started. We are reminded of this experience by receiving a few leaves of the plant grown by José Roges on the land of S. Blum & Bro., near Pinole. They show a thrifty growth, and give evidence of the adaptability of the soil and climate for its cultivation, and if Mr. Roges succeeds in curing it, as we learn it is his intention of doing, so as to make a good merchantable article, he can make a fortune for himself and add a valuable industry to the State.—*Contra Costa Gazette.*

THE AMSTERDAM CINCHONA AUCTIONS.

AMSTERDAM, Oct. 2.—At today's cinchona auctions 2,301 packages Java bark sold, with a rather weak tone, at an average unit of 9 cents (about 1⅝d per lb), prices on the whole being scarcely maintained as compared with the preceding sales. Manufacturing barks in quill, broken quills, and chips realised from 9 to 78 cents (1½d to 1s 2d per lb.); and root from 28 to 69 cents (5d to 1s 0½d per lb.) For druggists' barks in quills and chips, from 6 to 103 cents (1d to 1s 6½d per lb.), and ditto root, 9 to 24 cents (1½d to 4¼d per lb.) was paid. The principal buyers, in order, were Messrs. C L. Schepp & Zonen, Rotterdam; Matthes & Bormeester. Amsterdam: the Anerbach factory, and the Amsterdam Quinine Works.—*Chemist and Druggist*, Oct. 4th.

PAPER PACKING FOR TEA.

We are interested in learning that so satisfied are the proprietors of the Elkaduwa group of tea plantations with the prepared paper introduced as packing, instead of tea lead, by Mr. Maitland-Kirwan, that they are continuing to use it. Some time ago we announced the despatch of a break of tea so packed, but made up in 20 lb. boxes. This was pronounced quite a success in Mincing Lane. The Manager of Elkaduwa is now despatching another break, but in full chests of 95 lb. packed with the paper in place of lead. If this also meets the approbation of the buyers at home, the saving will be considerable, and Mr. Maitland-Kirwan will then no doubt take steps to advertise and sell the new packing, giving prices and his own experience of the economy effected.

BAMBOO CHARCOAL.—It is generally thought that bamboo being so light and small make a bad fuel wood, and no one would think it of any value as fuel for forges ; yet it is considered the best material for making charcoal for blacksmith work, and is in large demand all over Mysore. It is said to give off more heat than the best coke and to require less blast. A maund of bamboo charcoal fetches twice as much in the village-markets as the best charcoal than any other full. The method of charring bamboo is different to that used for harder woods—the stacks or kilns being carefully covered with green leaves and then plastered with wet clay. While the burning is going on, care is taken to exclude air as much as possible, without extinguishing the fire.—*Bangalore Spectator*.

MR. KELLOW'S WATTLES: "ACACIA DECURRENS."—When adding a note to the letter "From the Hills" the other day on this subject, we could not lay our hands on tho dimensions of some of his fine wattles (that do not send up suckers) furnished to us by Mr. Kellow. Here is the memorandum—one which ought still further to encourage planters to go in for "acacia decurrens," especially the Uva men with patana reserves. Mr. Kellow wrote :—

"Dimensions of some of my Acacia decurrens:—

	Height, ft. in.	Circum. at base. in.
No. 1—Acacia decurrens planted out in Nov. '87	.. 42 3 high	33
No. 2— Do do do	.. 36 0 „	24
No. 3— Do do do	.. 33 6 „	24
No. 4—Acacia germinated seed put into supply baskets June '89	27 6 „	20
No. 5—Acacia germinated seed planted in Nursery June '89 and not removed	.. 24 7 „	—

Number five is one of a batch of plants sold to the Forest Department 12 months ago but not removed so that it has not bad fair play (all patana land). If you want a successful belt I should strongly advise supply baskets as then the plants receive no check."

THE MAGAZINE OF THE SCHOOL OF AGRICULTURE for November opens with an article on Vegetable Manures and Cheap Fertilizers, dealing with green manures, peat, coir-dust, saw-dust, leaves, sea-weed and straw. Mr. W. A. de Silva continues his paper on indigenous food products and also writes on tho cultivation of the Tomato. "Aba" supplies another instalment of "Ceylon bee culture," and takes up the subject of poultry in a separate contribution. The rest of the contents consist of a note on heredity and sexuality, general items, occasional notes, and school news.

TEA COMPANIES' SHARES continue in the same dull and neglected position, and the latest accounts from many gardens do not lead one to expect that they can do otherwise than badly this season. The crop continues to be an unusually poor one as regards quality, for extremely little really fine tea is offered at our weekly sales. Prices here continue on an unsatisfactory level and will not be compensated for by an increased outturn as many gardens are already behind in this respect. All round the prospect before tea companies looks very gloomy, and at a time like the present it is very necessary for managing agents and secretaries to exercise the greatest economy and to cut down expenses to the very lowest possible limit. A determined attempt ought to be made to reduce the brokers, charges here, which have always seemed to me enormous and utterly unjustifiable. Brokers charge gardens at present 1 per cent for selling their tea, and buyers have to pay them 1 per cent for buying the same tea, so that every chest of tea sold at public auction goes home burdened with a broker's charge amounting to 2 per cent. Is it to be wondered at therefore that much tea is now diverted from the Calcutta market and shipped direct home by the grower or on the garden's account ? In these days of competition and reduced profits merchants are willing to move goods or money from one side of the world to the other for a certain profit of 1 per cent, and I cannot see that any justification can be offered for the enormous brokerages paid here on tea and indigo which are certainly doing much to cripple the trade in both these articles.—*Pioneer Cor.*, Calcutta, Oct. 4th.

POTATO DISEASE.—It is a recognised fact, that high moulding will save a large percentage of Potatos even when the conditions seem very unpropitious. Sulphate of copper also has great power in checking the disease. PRILLIEUX, in his experiments, obtained 115 sound Patotos by the use of a six-per-cent. solution of sulphate of copper, while from an equal area side by side, but where the copper solution was not used, only fifty-three tubers were produced, 32 per cent. of which were diseased. In 1888, M. A. GIRARD conducted two sets of experiments on different farms, using a mixture in water of 2 kilogrammes of sulphate of copper and one of quick-lime per hectolitre. A single application, as a curative treatment, largely reduced the disease, while as a preventive treatment it was a complete success. The solution was applied through an ordinary sprinkler. The increase in healthy tubers on each farm, by the use of the copper sulphate, was:—

A.		B.	
14·3	per cent.	......	per cent.
22·9	„	2·7	„
13·5	„	20·2	„
17·2	„	4·4	„

From all the figures presented it is concluded—1st. That the application as a curative treatment does not ensure absolute immunity. 2nd. However, in these cases, treatment diminished in a notable degree the number of diseased tubers, and at the same time increased the weights of the healthy tubers in a very different proportion according to the variety used. 3rd. That the varieties treated, in respect to their receptivity of the disease, differ widely. A 2 to 3 per cent. copper sulphate solution is recommended. It is mortifying to see no steps taken to combat the disease, while no means is neglected to ensure the propagation of the disease. The apathy is from no lack in the supply of information.—*Gardeners' Chronicle*.

THE DEVELOPMENT OF MADAGASCAR.

In a letter recently to hand from Antananarivo, the Editor of the *Madagascar News* says:—

"Madagascar by reason of the Anglo-French Treaty on African partition is now prominently before the world, and the course of events here will doubtless be of interest to your readers, especially as there is every reason to expect that the vast mineral resources of the country will very soon, if not immediately, be opened, either by the Malagasy or the French, for development. To push on the approaching development and to forward British interests here, I shall be much obliged if you will exchange papers regularly, and I would impress upon you that the so doing would materially promote British interests in other country by strengthening the only British newspaper published in the island.

Writing to us on Sept. 29th the Editor further says:—

"Many thanks for your notice. Shall be pleased to exchange with your regularly. It is expected here that the Hovas will cave in.' The feeling is, the sooner the better if they do not throw the country open. Missionaries as well as merchants are tired of waiting for progress. The country is growing poorer, the people becoming more downtrodden, when under a fair ruler both have great capacities for development. The Hovas have alienated their best friends by their misgovernment; and the feeling, as before said, is, the sooner something is done the better."

THE PREPARATION OF CACAO (COCOA).

In the Trinidad *Agricultural Record* has been published a series of elaborate essays on the fermentation of cacao beans and the other processes necessary to render them fit for despatch to the selling market. Those essays will be reprinted in the *Tropical Agriculturist*, and meantime we are able to present to our readers a review of their contents, by a planter entitled to speak with authority, in which the results of local experience are given in a most able and valuable form, such as must render it acceptable to all interested in the product, here and elsewhere:—

The Essays on Cacao Fermentation appearing in the *Agricultural Record* of Trinidad for March 1890 are exceedingly interesting; and although the methods described all differ much from that pursued by us, which we consider the best, it by no means follows that we have arrived at perfection, or that we have nothing to learn; indeed judging by the range of prices realized by different estates it seems that some of us have yet much to learn in this important matter of curing of cacao. Knowing little of chemistry I cannot fully follow the learned writer of the essay to which was awarded the first prize. I have no doubt that the various changes described as taking place during fermentation are all accurately recorded, and that to those who understand them they will prove most interesting and instructive. To the ordinary planter, however, the fact that during fermentation certain changes take place which suppress the bitter principle and develop the conditions and flavour necessary to render it fit for food and marketable, is all he cares to know; and to afford the desirable information as to which method is the best to gain this end is the object of the essayists. The various methods in vogue in Trinidad and Grenada are fully described, and preference seems to be given to that introduced by a Mr. Strickland. The writer of the first essay says that the Criolo cacao requires only 3 days' fermentation (we allow 5 to 7), and as Ceylon cacao is the Criolo or Caracas variety, it may in some degree perhaps account for the fact that the elaborate and lengthened fermentation, said to be necessary to the full development of the flavour and requisite colour of the forastero or Trinidad cacaos, has never been tried here. It is only within the last five yeaars—after the scare caused by drought and *helopeltis*—that these hardier varieties have found favour with some, most still standing by the delicate criola as the best paying. Ceylon planters object to "dirt in the wrong place," and hence have never adopted the practice of drying cacao by mixing earth or any other substance with it. On one occasion an experiment was tried with a few lots by drying without washing, but the result every way was so unsatisfactory that it was never repeated. It is just possible that the curing of the forastero beans may not be such a simple matter as is that of Criolo, and someone or other of the best methods described by the essayists might be tried with a view to determining whether or not they are improvements upon ours.

I may here state that I have sold in the local market forastero cacao cured in the ordinary Ceylon fashion at from R1 to R2 per cwt. more than that realized by Criolo. Two lots of forastero fetched R55 and R51·50 per cwt., while Criolo sold at the same time brought only R54 and R49·50 per cwt. I have not yet tested the home market with it, but I believe that others have, and that prices equal to that obtained for the best criola have been realized. The plan of curing generally adopted by Ceylon planters is as follows, and is simple, expeditious and cleanly; as a rule no cisterns are built, though boxes or troughs are sometimes used, and there is no testing with a thermometer to ascertain the degree of heat in the mass. Pods are always gathered ripe and are brought and heaped on the nearest roadside; an hour or two before knock-off time they are broken with wooden mallets, the beans being scraped out by hand and put into baskets or sacks and carried by the men to the fermenting house. This may be a room or two with mud walls and thatched roof, a lean-to to the store, or the cisterns of an old coffee pulping-house. A wooden cistern is always attached for washing the beans after fermentation is completed. Upon a platform of reepers and coir matting raised a few feet from the ground, and which allows the free escape of the liquor brewed during sweating, the green beans are heaped two to three feet deep, and covered over with old sacks and coir mats. Fermentation is completed in from 5 to 7 days according to the state of the weather and the thickness of the heaps; the heaps being turned over with wooden shovels and recovered on alternate days. This is for Criolo cacao; forastero should have 24 hours less fermentation. The beans are now thoroughly washed in several waters to free them from all trace of the sour mucilagenous matter adhering to them, and if the weather is fine they are spread thinly on coir mats laid on barbecues to dry in the sun, to ensure even drying and to prevent blistering, they are turned frequently by hand, and in three days are dry enough for dispatching. Should the weather be wet the washed cacao is at once taken to the drying-house which is a long ceiled room with two or three lofts of reepers and coir matting; upon these it is spread, and hot air supplied from many iron tubes heated by a furnace outside is drawn over and through the cacao and out at the bottom at the other end by means of a Blackman's or other fan. Twenty-four hours in this drying-house—called a Clerihew—is sufficient to dry it thoroughly. Mr. Jackson's tea drier is highly spoken of as a cacao drier. Mr. R. S. Fraser of Wariyapola says; "Mr. Jackson's tea drier is a perfect cacao drier, both in the very large quantity it will get through in a very short space of time, and the way in which it does it." See vol. V., page 379, of the *Tropical Agriculturist*. The American fruit drier has also been used with success. When there is no drying-house or where the quantity to be cured is only from 3 to 5 cwt. at a time, it is dried on a reepered staging covered with coir matting raised about 3½ feet above the ground; under this fires of dry wood are lighted and kept burning for about 36 hours, the beans being constantly turned. To concentrate the heat the space within the staging is enclosed: when perfectly dry wood is used the colour of the husk is

hardly affected. Cacao fermented and dried as described above is on the outside in the Criolo of a rich brown, and in the forastero of a golden colour; while in both when sectioned, the colour is warm, dark, a ruby red, and the flavour agreeable. I have never seen any cured cacao in Ceylon having, when sectioned, the rich cinnamon colour said to result from fermentation carried out after Mr. Strickland's method. To meet the requirements of some Continental markets, where a lighter colour both inside and out is desiderated, I am told that cacao is fermented for three days only. Our prepared cacao having no substance on it to sour or damp in wet weather fungus does not readily grow upon it. The proof of the pudding is in the eating, and the proof of the value of an article is the price it commands in the market; and as Ceylon cacao generally fetches the highest prices, I think we may fairly claim that our system is a rational one, and, if not superior, is equal to the best that is carried out by our Trinidad brother planters.

CEYLON TEA IN RUSSIA.

THE NEW VICE-CONSUL AT ODESSA.

Lieut. A. P. Murray, of the 1st Battalion Gordon Highlanders, has just been appointed Vice-Consul at Odessa. This is a peculiarly fitting appointment, Mr. Murray's knowledge of the Russian language being so good. The young officer was much liked and esteemed while in Ceylon, and as everything connected with Russia and its trading ports at this time reminds Ceylon folk of the chance of getting their tea more freely taken up, may not this appointment be of some advantage? If Mr. Murray can say a good word, or use any influence, on behalf of Ceylon tea, we feel sure he will not refuse to do so.

"HOP TEA."

Maidstone is in a state of pleasant excitement because the hop-growers, who have been "grubbing up" hop-ground on account of German competition, have found a new market for the *Humulus lupulus.* All Kent is drinking hop tea, because in September all Kent lives almost literally on hops. Mr. Snelling, a well-known tea merchant of Eastcheap, conceived the idea of making hop tea, and bought tons of hops before even the machinery had been laid down for converting the herbaceous twining plant into a product which, before it is mingled with the ordinary tea of commerce, looks like a cross between Bristol bird's-eye tobacco and rough, strong Assam tea. Then Mr. Patrick Eugene Macgregor, who is one of the best known planters in Assam, was called in as expert. He is now making hop tea in a factory on the Medway. We visited the factory, of which I send a view. There Mr. Macgregor was busy at work with the machinery which he was accustomed to use in Assam. The tea-rolling machine represented in our view of the inside of the factory is exactly that which is being exported to Assam and Ceylon by the dozen; but it is the first tea-roller which has been used on English soil, and that is the first "Sirocco" drying machine (in which hops are being made into tea) which has ever been put into motion this side of Colombo. Now, more hop tea is ordered than the present machinery can turn out. The faculty has discovered that the lupulin of the hop counteracts the excessive tannin of the ordinary tea. Is it cheap to produce? No; it costs about twice the price of excellent tea from India or China sold by auction in Mincing-lane. But a proportion of hop tea added to the tea of commerce—the proportion is the secret of Mr. Snelling and Mr. Macgregor—will make a drink which will cheer and not inebriate General Booth and Sir Wilfrid Lawson, especially if they are dyspeptic persons, and cannot drink finest new Pekoe with impunity.—*P. M. Gazette.* [The illustrations represented "'India in Kent.' A Tea-House on the Medway,'" and "Inside the Factory: Roller and Drying Machines."—ED. *T. A.*]

COFFEE IN BRAZIL.

According to all accounts the blossoming is so abundant up country that the prospects are exceptionally good for an enormous coffee crop next year, both in the Rio and São Paulo districts. The season has thus far been most favourable, with just rain enough and a continuance of cool weather, to develop a strong and healthy blossom. With anything better than half a show, the crop is sure to be a large one.—*Rio News.*

NOTES FROM EASTERN ENGLAND.

(*By an ex-Ceylon Planter.*)

Sept. 25th.

The gap made amongst old friends at home since I came home has been heavy, and the end of all flesh has been busy too, amongst those I knew in Ceylon since I left. A death announced (of a European) in your columns when I first arrived in Ceylon was something to talk about; now unless personally known, little thought is given to it. A rev. friend came in lately. I had just laid the *Observer* down. "Oh!" he says: "a foreign paper, I suppose." "Yes," I said, and handed it to him. After turning over the pages. "Bless me," he says, "why it is quite interesting reading; it tells you something about the quinine, cinchona tree, coffee, tea, and many things which people know nothing of here." I was amused at hearing such remarks; it is strange what little is really known of our colonies in the eastern seas, in fact what interest is taken in them is confined to those who have friends or property there. But I must say *tea* is making the *name* of Ceylon more familiar now even in the remotest country villages, and many dodges are used by unprincipled parties in dubbing filthy stuff with the name of Ceylon tea, some advertised at 1s 4d per lb! and I saw a red handbill lately stuck into parcels of grocery, setting forth the goodness of the celebrated 'Mazawattee tea' at 2s per lb. I wish I had kept it to enclose to you. I can assure you that 'bluffing' is not confined to America, it may be of American growth, or raising—but it takes very kindly to commercial soil in England as if it was of indigenous growth. It has been said that the weather is a standing topic of conversation in this country, it may well be so with the present summer for an example. A fine summer day has been a rare experience since the end of May to the beginning of this month, but I am happy to say that the farmers have had on the whole a good harvest time, and more than average crops, but still they grumble there is something wrong somewhere. The ground game act and the duty off malt were to set all straight with this class, but I cannot learn that they are a cent the better for either. I have asked many questions of a variety of people—from large and small occupiers to landlords and labourers—on the subject. Nothing but the rabbit gets a bad word, and he is not at all in the way on waste lands but affords sport which so many crave for. As to the hare, its fast disappearing is much deplored about here, it is getting quite scarce, horses seem to have forgotten what they are. They so rarely see one, for lately a farmer and his wife were driving down a lane, when a hare skipping across the road so frightened the horse that he bolted. Though overturned they fortunately escaped serious injury.—I am sorry to find that the climate has now two, at least, strong competitors in engrossing conversation, viz., drunkenness and the unrest of the labouring classes. The former is fearfully prevalent and an awful curse. I could not have believed half what I have seen of it, had I read of only; and the latter is an ominous dark cloud hanging threateningly over all, and I fear will end in much suffering to the labouring class. I am glad to hear Ceylon is so flourishing. Long may she continue!

NOTES ON PRODUCE AND FINANCE.

POOR CHINA! According to a telegram from New York the prospects of a through trade in tea between China and Europe over the Canadian Pacific line are not progressing favourably. This is short and sweet, at least to planters in India and Ceylon who wish to keep the supply of tea to European markets as much in their own hands as possible. If Ceylon planters conquer as many countries as they have laid siege to, the direct trade in China tea will not be very large anywhere.

NO PRESUMPTION. "Is it presumption in an English man to say that he can teach the Chinese bow to grow tea?" asks an evening paper. We should say not, indeed. The planters of India and Ceylon could teach the Chinese not only how to grow tea but where to find the best market for it, but they would much rather not. It pays them better to grow tea themselves, and to beat the Chinaman out of the field.—*H. and C. Mail*, Oct 10th.

"TEA OR COFFEE" IN AMERICA.

[In order that you may know all that is going on as promptly as possible, I send the enclosed which will appear in the *Standard-Union* tomorrow. Copies of the paper containing it will follow by first mail. I am very sorry that in consequence of business engagements I failed to meet Mr. Grinlinton, but I have the best reason for believing that his visit here was pleasant to him and satisfactory in its result.—*New York Cor.*]

AN AMERICAN-CEYLON COMPANY SOON TO GO INTO ACTIVE OPERATION.

WHAT HON. MR. GRINLINTON THINKS OF AMERICA AND AMERICANS—REMARKABLE DECADENCE IN THE PRODUCTION OF COFFEE—GROWTH OF CEYLON TEA EXPORTATION.

The project, of which some account has already appeared in the *Standard-Union*, of handling the teas of Ceylon on a large scale in this market, is progressing favorably, and the enterprise will doubtless soon be in actual and successful operation. The Ceylon Tea Planters' Company (Limited) has been organized under the laws of the United States, and agencies will soon be opened in all the principal cities of the country. Mr. Pineo, formerly a Ceylon planter, and who has exerted himself with much success in making Ceylon teas known throughout the world, will be the general manager of the company with headquarters at New York. Hon. J. J. Grinlinton, of the Legislative Council of Ceylon and for many years a planter in that island, sailed the other day on his way home after a most satisfactory and encouraging visit to the United States in the interest of the proposed new departure in the tea traffic. Before his departure Mr. Grinlinton favored a representative of the *Standard-Union* with an interview, in which some highly interesting facts were disclosed.

"After a residence of over thirty years in Ceylon," said Mr. Grinlinton, "I have the coffee, tea and cinchona business at my fingers' ends. Some few years ago the annual export of coffee from the island of Ceylon was 1,000,000 hundredweight, last year it was only one-tenth as much. The coffee grows there at an altitude of from 1,700 to 5,000 feet above the sea. The chief reason for the decadence of coffee is that some few years ago a fungus parasite attacked the plant and is gradually killing it. Not only is this true of Ceylon, but it is also the case in Brazil and other coffee-producing countries. The consequence of this seems to be that people must learn to replace the use of coffee with that of tea. The price of coffee has been gradually ascending of late and will continue to do so, and the time is not far distant when the production will have been reduced to such an extent as to bring coffee beyond the reach of ordinary people. When this parasite attacked the coffee berry of Ceylon, the planters cast about for something else to replace the coffee plant. This they found in tea. Only a short time ago the exportation of tea from Ceylon amounted to but 50,000 pounds annually, while this year it will reach the enormous quantity of 40,000,000 pounds, the majority of the higher qualities being purchased in Mincing Lane, London, for the Russian and Irish markets, these being the countries which consume the finest qualities of teas and consequently, preferred that of Ceylon to all others. Our crop of Ceylon teas is increasing to such an extent that we have had to reach farther afield for other markets in order to prevent the supply from exceeding the demand. I trust the American public will appreciate the efforts we have made to place within their reach the superior qualities of teas produced on our island. Heretofore, the formation of such concerns has taken place in foreign countries, formed exclusively of foreigners, with agencies in the United States, thereby virtually asking the American public to lay out their money for the support of a foreign corporation; and we trust that when the fact is generally known that the Ceylon Planters' American Tea Company has been formed in the United States and composed of American, as well as English and Ceylon capitalists, every possible encouragement will be afforded it." Mr. Grinlinton, in speaking of other products of the island of Ceylon, said: "We export much cinchona, and I am glad to learn that your Senate has just decided not to take quinine off the free list. Colombo," said he, "is now the emporium of the East, with a population of 150,000 people, but, strange to say, of all this number but one is an American, and he the representative of the United States in the island of Ceylon. The European population is composed chiefly of Englishmen, and the natives are the most honest and respectful of all the natives of the East, and any lady would be perfectly safe in journeying alone from one end of the island to the other." It is not difficult to understand the reasons of Mr. Grinlinton's popularity in his island home, as a more bluff, hearty and genial English gentleman it would be difficult to find anywhere. In speaking of his trip through the United States he commenced by saying, in a quaint manner peculiar to himself: "Why, actually, upon stepping from the steamer to the dock in New York the customs officers insisted on examining all my luggage, which seemed rather strange, as no officer in Colombo would think of to examine my hand-bag; but of course, I submitted gracefully and must say that I found the examining officer the most courteous and polite of gentlemen, who explained that he was but doing what his position compelled him to do, and in all my journey through the country I met with universally courteous treatment, even upon one occasion where it was necessary in making connections to take a train in the middle of the night, and having neglected to secure beforehand a sleeping berth, I was compelled to take the only seat to be found, which was in the smoking car, which was otherwise filled with what appeared to me to be a rough-looking lot of people, an opinion which was quickly shown to be erroneous, as, in order to make me comfortable, some of them insisted upon doubling up, as you call it, in order to place two seats at my disposal; and I am now about to start on my 11,000-mile journey for home, with the kindest thoughts for all of you Americans and a regret that I cannot remain longer with you."

Evidence of the merit of the Ceylon teas is also found in the effort before the Senate to add to the tariff a discriminating duty of 10 per cent on teas grown or produced east of the Cape of Good Hope imported from countries west of the Cape. The claim is made that the section of the bill has been added at the instigation of a few interested tea dealers who wish to confine the importation of tea to those countries where it is the most difficult for the smaller dealer to send orders, and is in reality aimed at the London markets; that Great Britain, against which the section is directed, admit every product of the United States except spirits and tobacco free, and that, therefore, no principle of protection is

involved, and consequently no reason for discrimination against tea other than other products of the Orient, which are largely re-shipped from European countries that the teas imported from London are on a higher average quality than the direct imports and that more than nine-tenths of these teas are bought in London by American merchants before shipment; and finally that section has been enacted before and repealed during a Republican administration, and that its reappearance now is due to the initiative of about five interested persons, while the majority of the trade are opposed to it. The British authorities annually seize thousands of chests of Chinese and Japanese teas and destroy the same as being unfit for human food. A few unprincipled dealers in this country, ascertaining that this stuff could be safely landed here, eagerly grasped the opportunity of purchasing and importing large quantities. The impurity of China teas is further sustained by United States Consul Crowell at Amoy, China, in his letter of Feb. 4th, 1889, page 589, in which he speaks of China tea as "vile stuff," etc., for the American market. In speaking of Ceylon teas, Senator Evarts himself says: "They are the only pure teas in the world," and English enterprise has been struggling for the last two years to introduce them into this country, meeting with much opposition from those wholesale dealers who find there is more money in handling adulterated China teas than the pure ones of Ceylon.

The following official table, showing the annual consumption in pounds, gives the best idea of the progress of Ceylon tea in Great Britain:

	1885	1886	1887
Ceylon ...	3,218,000	6,245,220	9,911,860
China ...	113,514,000	104,229,313	90,581,753
	1888	1889 Jan. 1st to Oct. 1st	
Ceylon ...	18,553,054	25,350,000	
China ...	79,792,866	51,800,000	

The English are known to be connoisseurs in teas, and the American taste will doubtless ratify the choice of the mother country.—Brooklyn *Standard Union.*

INCINERATOR REFUSE.—As an experiment, 1 hundred bags of ash refuse from Mr. Harrington's incinerator in Circular Road Calcutta, have been sent up to a tea garden in Assam to tests its fertilizing powers and consequent value as a manure. —*Indian Engineer.*

UDAPUSSELLAWA.—The prospects of a good coffee crop next year are looked forward to from this district also, and several good blossoms have been out on all good coffee during the last month. Tea is flourishing but not flushing well just now, and some estates are busy pruning and cutting down the tea bushes. There have been a few days of rather strong puffs of wind lately, but not much rain, the nigh s are getting colder, and signs of the north-east monsoon being near at hand.

THE SUCCESS of the Colonial College at Hollesley Bay for young men has suggested the establishment of a branch of the Forsyth Technical College, specially devoted to the training of women for colonial life. There being no capital available for the purpose, it will be necessary to raise a guarantee fund for working the experiment for three years, and the board have an immediate offer of 200*l.* for the initial outlay, provided the required total of 1,500*l.* can be raised. According to the Managing Director—Ethel Forsyth—"The training that is proposed will embrace dairy work, poultry and bee farming and horticulture, and the laundry. Cooking and housework of the establishment will be undertaken entirely by the students themselves, under competent supervision. One year's residence will be compulsory in order to gain the college certificate. A suitable house, with farm buildings and land attached, and near a market town, can be had on easy terms if taken at once, and there is no doubt that there is a great and increasing demand or such training as we propose to offer."—*E. Mail.*

COLD SEASON LIFE ON A CACHAR TEA GARDEN.

Delicious weather, morning air exhilarating as champagne, Italian skies, roads hard and dry—it is glorious to get on one's pony and have a rattling canter over ground which till the other day was a series of sloppy, sticky mud-puddles, interspersed with occasional quagmires. Choti haziri is no longer an unpleasant duty, and the daily cold bath is scarcely the luxury it was. A few weeks ago, on coming in from our muddy round of the garden works, we were inclined for nothing but a long chair, a cigar, and a peg. Nowadays he can tramp all over the country, or wade through bheels for hours after snipe, come home and set to a vegetable gardening (by the way I wish the Agri-Horticultural Society would send up our seeds), and never think of anything stronger than claret and soda.

One's enjoyment of the exquisite weather is, however, sadly dulled by the rapid manner in which the gardens seem to be shutting up. The bushes are assuming a regular cold weather appearance, and some sections look as though they intended giving but little more yield. And this is only September. The season has been a complete chapter of accidents, a chain of misfortune from first to last, and until lately, as unpleasant as unfortunate. I fear it is a black look out for many concerns and many managers. A number of gardens, behind in outturn as it was, are rapidly going from bad to worse.

Down below the bungalow teela the green expanse of tea-bush surface, stretching away into the distance, glistens and sparkles with the dew in the morning sun. It is studded and diversified with the white, red and multicoloured garments of the leaf-pluckers. I have just been pitching into the sirdars about some careless plucking, and the sirdars, are, in turn, giving it to the pickers. The women are an uninteresting lot, on the whole, with a few exceptions, notably our old acquaintances Rosy (Golabi), Sweet face (Sudamukhi) and Nectar (Amrita). The fresh lightness of the air has enlivened them, and they are in high spirits, laughing and joking. An interesting colloquy is taking place between the three young women and a sirdar, who, standing on the road in a hortatory attitude, is getting rather the worst of the argument, and beginning to lose his temper at the chaff. Each of his admonitions regarding leafplucking is repeated with the utmost gravity by the two trio in a chorus, and in tones of serious exhortation to one another. It sounds as though the sirdar were conducting a sort of agricultural Litany, and the three girls intoning the responses. It makes the sirdar very worth indeed. "Bohoot achcha, good old sirdar," concludes Golabi, "we will remember to pluck beautiful leaf for evermore. Oh, here's the Sahib, come along and show us how to pluck, Sahib." This young woman is in a chronic state of requiring my instruction. Her thirst for information would be most praiseworthy, but somehow my patient teaching invariably proves to be painfully devoid of result when her basket comes to be examined at leaf-weighing time. Sudamukhi has a pain in her finger, and wants me to look at it, and give her a holiday. Amrita would like her temperature taken with my little pocket clinical thermometer, as she thinks she has got strong fever. I tell her she does not look in the least feverish, and that if she really had a strong attack, she would not think so, but would be able to speak with full confidence on the subject.

Changsil and Fort Aijal are holding out pluckily. Captain Cole has sent a letter stating that there has been seven day's continuous fighting, but that the Lushais have retired somewhat. Three hundred and fifty of the 3rd Bengal Infantry have arrived, and the campaign will be a military affair. The detachment of frontier police from Debrughur take up the guards on the frontier. Captain Maxwell returns to Debro. I hope that Mr. McCabe will give the Lushais what the Irish style "taste of his quality."

I hear that the Manipuris have risen in revolt, occasioning the flight of the Raja, who, I believe, subsequently abdicated his throne. Two hundred men are

on their way from Kohima, to quell the disturbance. Altogether we are having quite a lively time, and it is likely to continue throughout the winter season. It is more cold weather than ever. The ground is becoming as hard as bricks, and I expect I shall have to reduce the hoeing tasks in order to get proper work. Five weeks ago the kodallis went up to the head into the soil, with their own weight.

The neem trees are looking dull and wintry. My commission on the season's working begins to look very distant, and I am afraid there is but little chance of the proprietors seeing their way to double my salary.—*Correspondent of the "Englishman."*

CEYLON UPCOUNTRY PLANTING REPORT.

PORCUPINES, CACAO BARK AND TEA SEED—ANOTHER ENEMY OF THE CACAO PLANTER—THE CACAO THIEF AND THE VILLAGE HEADMAN—A MYSTERY SOLVED.

Oct. 21st.

Men who know what havoc a porcupine can make in a cacao garden will be pleased to learn that dearly as that animal loves to tear the bark off the cacao tree, and destroy the pods, yet he is fonder of tea seed. An estate which was surrounded with scrub, infested with porcupines, and which suffered considerably from their ravages, has for some time now been wholly free of this plague. A field of tea has come up close by. The other night a porcupine was shot among the tea. The Sinhalese watcher had for some nights before been hearing a cracking sound among the tea trees, but could see nothing. Watching more carefully, he discovered a porcupine which he shot, and in the morning it became quite clear that it was the tea seed the brute had been after, and on which it had been freely feasting.

A worse enemy of the cacao planter is the Sinhalese rogue. The manager of a cacao garden told me the other day how about half-past six in the evening his watcher caught one of these fellows a little way from the boundary, with several measures of the fruit in his possession. An attempt was made to run the man in, the watcher offering his services to the extent of being prepared to swear that he caught the thief on the estate; but was told that he must stick to the truth. He did this, and the magistrate acquitted on the ground that there was no proof that the cacao had been stolen. The planter felt a little sore, and when his feelings were in this tender condition he had a visit from the local headman. This worthy had come to condole, which he did, adding as a reason for this miscarriage of justice, and perhaps too as a hint for future guidance: "Sir, how can you expect to get the thieves punished in the Police Court, unless you tell lies"! The planter says that the next man that is caught won't be taken before the magistrate, neither will any lies be told about him, but he will assuredly be punished!

There was a row in a cacao garden, owing to a number of branches having been broken. Careless gathering was supposed to be the reason, but yet it could not be satisfactorily brought home. After a bit, the watcher, out after squirrels, found the culprit and shot him. It was not a cooly, but a big scaly creature which had gone up the tree after red ants, and the weight of whose body had caused the damage mourned over. One lives and learns.

PEPPERCORN.

THE LEAVES of the Duboisia Hopwoodii, an Australian shrub, are chewed by the blacks as a substitute for tobacco. They contain an alkaloid called piturine, which, according to some chemists, is identical with nicotine, or at least closely allied to it.—*Globe*, Oct. 10th.

NILGHERRY TEA DOING WELL.

We notice in Mr. W. G. and H. Thompson's Indian Tea Circular, of the 25th ultimo, that 107 chests Kodanaad Nilgherry tea sold at prices ranging up to 1s 7¾d the broken pekoe realising that high figure, whilst the pekoe souchong fetched 11¾d. These results, which surpass Ceylon and equal some of the best northern manufactures, should encourage Nilgherry planters. Climatic influences may affect the yield of Nilgherry estates, but when the manufacture is carried out with the best machinery, and in accordance with the most approved processes, the quality leaves nothing to be desired.—*M. Mail*, Oct. 20th.

HIGH AND LOW CINCHONA PRICES.

The now unusually high price of 1s per lb. was realised on Tuesday by a few lots of very fine bark—the first being two bales of renewed officinalis shavings from Ceylon, and the next 10 bales bold Ledgeriana stem chips from India. For one small case of renewed quilly Succirubra chips from Ceylon the unusually high figure of 8d per lb. was also paid. At the other end of the scale the lowest price realised at the auctions was that paid for 3 bales Succirubra twigs from Ceylon, which sold at ¾d per lb. Some years ago, when 2s 6d or 3s was a usual price for red chips, such twigs were thought cheap at 10d per lb. This week also 1¾d per lb. was the best offer that could be obtained for some damaged soft Colombian bark, imported as far back as May 1880. The broker was not at liberty to accept this bid, and bought in the parcel at 2½d per lb., plaintively observing that when he offered it the last time—ten years ago—he rejected an offer of 1s 9d per lb. for the same lot. The parcel was a small one, and the loss to the importers—apart from the cost of the warehousing of the bark—probably not over 200*l*. About a decade ago offers of 4s per lb. were more than once refused for a specially fine brand (Z O) of this same variety of cinchona, but the owners of these lots were comparatively fortunate, as they have since been able to clear them at about 8d per lb. The large quantity of Calisaya bark from the South American plantations formed a feature of the auctions. Nearly 90,000 lb., mostly of recent import via Liverpool or Hamburg, passed the hammer, and two-thirds of this was sold. It must not be forgotten that this bark is nearly twice as rich as the average Ceylon or Indian bark. Most of it is bought by the English quinine-makers.—*Chemist and Druggist*, Oct. 11th.

"THE CEYLON TEA COMPANY LIMITED."

As we fully anticipated the leading gentlemen connected with the local Tea Fund have seen the necessity for organizing a Limited Company to carry on after a commercial fashion the business created through the operations of the Fund's Agents. This was made very clear in the case of Russia the other day, when it seemed so great a pity not to pick up at once the interest and good-will created by M. Rogivue. We therefore highly approve of the new Company, into which we have no doubt, the Ceylon Tea Fund will eventually merge, and we are glad to see it is to be supported by leading planters and merchants. It is proposed to begin with the modest capital of R100,000 and the main object is to deal with the Continent of Europe as may be seen from the list of agencies appended. We quote as follows:—

The objects of the proposed Company are the sale of Pure Ceylon Tea, the pushing, advertising and generally making known Ceylon Tea throughout the world. To enable the question "where can we buy Pure Ceylon Tea" to be answered by and on behalf of Ceylon Tea growers. To supplement and support the action of the Ceylon Tea Fund" by attending to the execution of orders for Ceylon Tea, and the appointment of Agents,

It is believed that, apart from the general good to all Ceylon Tea Growers and to the whole Island that will result from the undertaking, dividends will be earned by the Company when fully established.

Agencies will be opened in various cities throughout the world as opportunity offers :—

London, Colombo, England, Scotland, Wales, Austria (Vienna), Belgium (Brussels), France (Paris), Germany (Berlin), Russia (Moscow), Turkey in Europe (Constantinople), Australia (Melbourne), New Zealand (Dunedin), Tasmania.]

We do not see why every Teagrower in the country should not be a shareholder, for he might in this Company expect a fair dividend for his investment as well as the indirect benefit sure to result to the Ceylon Tea Trade at large.

CAN THE COLOURS OF CORAL BE PRESERVED.

Such is the tenour of a query addressed to us by a correspondent, and it is one to which we do not feel justified in giving a positively negative answer in view of all that is being accomplished in the present day. We believe that efforts have been made to secure permanence to the vivid colour which distinguishes corals when viewed in their native *habitat*, but we are unable to inform our querist as to the degree of success which has attended such efforts. It is suggested that as after much experimenting, it has been found possible to fix the fugitive colours both of grasses and flowers—and in this connection attention is directed to the marvellously preserved grasses, &c., with which many of the oases of stuffed birds in the Museum of Natural History at South Kensington are provided —it might be found possible by some methods akin to those by which that result has been attained, to accomplish what is now desired, namely, the rendering permanent the colours which are so resplendent among corals when viewed from a boat and during their natural growth. Were these colours natural to, and inherent in, the corals themselves, as they are in grasses and flowers, it would seem as if this suggestion might not be wholly wide of the mark; but we believe it to be the fact that the resplendency to be seen while corals are in growth *in situ* is due, not to any pigment contained in the formation of the corals, but to the animalculæ which encrust them. These die almost immediately on exposure to the air, and the vivid colouring which charms so greatly when viewed through the medium of sea water almost entirely disappears when the coral is raised to the surface.

This is, we believe, the fact as regards all the coral found growing in Indian waters. At the same time we are aware that the fishers of the Mediterranean constantly obtain specimens, both of pink, red, blue and yellow coral, which stand the test of exposure and form the material from which the very lovely ornaments, sold chiefly in Naples and its neighbourhood, are prepared. Can any of our readers inform us as to whether the corals so worked up are subjected to any treatment preservative of their natural colour? Our own impression is that they are not, and that the colouring pigment is inherent. If this impression be correct, it is difficult to conceive any reason why, among the many varieties of coral produced in Eastern waters, there should not be some at least possessed of this quality of natural permanence. No one who has once visited the lovely submarine gardens to be seen off the shores around the island of Ramesvaram and in or near to Galle harbour can fail to retain recollection of them as "a thing of beauty and a joy for ever." We have no hesitation in declaring that a view of these is ample repayment for a journey expressly made to their locality, and we really believe that an excursion trip organized by one or other of our steam launch proprietors would receive patronage and the cost of it be productive of no disappointment to those sharing in it.

This, however, is but a secondary matter. The point just now is whether it might be possible to perpetuate the splendour of such submarine gardens. If this were possible, we are assured that the fringes of our shores would furnish a harvest certain of great remunerative appreciation at home. The much prized pink coral of the Mediterranean fetches, we are told, more than three times its weight in gold for the more sought-after shades of colour. Even supposing that, as mentioned above, the colours are due to living animalculæ rather than to the coral itself, the question naturally suggests itself whether it would be wholly impossible to preserve these coloured creatures upon the coral and so perpetuate the beauty—the extreme beauty—of its appearance. Of grass we are told by the Psalmist that "in the morning it flourisheth and groweth up: in the evening it is cut down and withereth." This, however, has been falsified in a sense, for the grasses at South Kensington above referred to, look as fresh and as lovely as if still growing upon their native soil. Is it looking forward too much, or placing too great faith in the scientists of this advancing age, to hope that some similar method of treatment might be as successfully applied to submarine as to super-terrannean gardens! Granted that the conditions of growth and the basis of formation are altogether different in the two cases; still in the one decay is but arrested, and such a principle does not seem to be wholly inapplicable to the other. We have seen fishes preserved by Mr. Haly with their natural brilliancy of colour retained. It would not, therefore, seem to be wholly irrational to hope that means similar to those employed in their instance might solve the query in reference to the corals which so freely surround us in this island. On the other hand we are bound to recall the fact that some time ago an Italian who was very eager to commence fishing off our coast for colored, if not pink coral, was discouraged by the then comparatively plentiful supply available in Europe. Has this been worked off and is the price really as high as has been indicated to us above,— are questions we should like to see answered authoritatively

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COFFEE.—An anonymous correspondent in the *Jornal do Commercio* of the 28th ult. says;—"Trustworthy advices from the states of Rio, Minas and S. Paulo give the future crop (coffee) as without equal; the trees are so covered with blossoms that they appear to be sheets, and from the appearance of the buds a much heavier blossom is expected in the months of September and October."—*Rio News.*

A MAN here has applied for a patent to petrify clay walls and publishes the formula in the *Diario Official* of the 23rd. It is: in 100 litres of water dissolve 1 kilogramme of shell lime, 1 kilogramme of *jaggery* sugar and 1 kilogramme of *caths*, whatever that is. Mix your clay with the mixture and set up your walls. Perhaps some of our Ceylon friends will tell us what *caths* is ?—*Rio News*. [The word is, of course a corruption *of kahata* astringent fruit,—ED. *T. A.*]

FORTUNE-SEEKING IN EAST AFRICA.

Mr. Henry Brown, the Ceylon Police Inspector and formerly coffee planter, who is also known by his book on "Sport in Ceylon," is on his way to East Africa, having obtained six months' leave from the Inspector-General of Police. Writing from Aden on Oct. 14th, he says:—"Here I am vegetating amongst the barren rocks of Aden, and a more wretched place I never saw. I leave here tomorrow by a vessel of the new German line called the German East African Line. The steamers of this line call at all the ports on the coast as far down as Mozambique, and from thence I shall get a Portuguese steamer to Quilimane. I see the Bombay, Madras and Calcutta newspapers, but none of them come up to the *Observer* for news and items of interest. * * * I had to leave Colombo with only four hours' notice, and—what do you think—missed my steamer for the African coast owing to having been put 24 hours in quarantine, which seems absurd, for the 'Navarino' was 24 hours in quarantine at Trincomalee, and brought the General and party round to Colombo, and obtained a clean bill of health from that port. Only myself suffered, however, and I was put on a wretched lights-hip all alone. There is no newspaper published in Aden, but there is much need of one, for the carrying on of some of the official and unofficial residents is scandalous, to say the least, especially as regards their observance of the Sunday."

HOP TEA.

To the Editor of the *Home and Colonial Mail.*

SIR,—I have read with great interest the two accounts of "Hop Tea" in your issue of Oct. 3rd, taken from the *Daily Telegraph* and *Pall Mall Gazette.* The former paper is very misleading, as the produce is sold in packets, all marked in large letters, "Indian and Ceylon tea, mixed with English hops." The word "adulteration," which is so freely used by the *Daily Telegraph,* is a very ugly one, and quite uncalled for. No man with a single spark of honour would be associated with a company that manufactured an article for adulteration. I am in no way connected with the Hop Tea Company, Limited, further than I received a fixed salary during the hop season, which ends this week. But for my own and the sake of others I state that there is not one iota of truth in the statement made by the correspondent of the *Daily Telegraph* as to adulteration. Further, his statement "that the buyers give the farmers 4d to 6d per lb. for green hops, the margin of profit is obviously great," is misleading, and requires explanation. Your readers will easily make their own calculations from the fact that it takes four to five pounds of green hops to make one pound of dried hops; then add to this cost of English labour, machinery, and all manufacturing charges, &c. The tea planters of India and Ceylon are satisfied as long as it creates a demand for their teas and helps to push China out of the market, and they know that only a very small proportion of the precious hops can be used in their tea. There is no doubt that the mixture is a great improvement. The hop growers like it because it makes a new market for their hops, and some of them are of opinion that the "Sirocco" is likely to prove a successful rival to the old-fashioned way of drying hops. This only shows how many uses that valuable machine invented by Mr. A. C. Davidson, the popular Cachar planter, can be put to. The tea consumers like it, and repeat their orders, and those that could not drink tea before are obtaining the sanction of their medical advisers to use tea with hops in it. Grocers like it because it is liked by their customers. I know of one grocer in this town who has sold on an average over twenty chests per week. It is with the deepest interest I have read Messrs. Gow, Wilson, & Stanton's most interesting yearly statistics, showing how Indian and Ceylon teas are year by year superseding China teas, and now your fellow countrymen from the "Garden of England" join hands with those that have invested millions of British capital in India and Ceylon.—Yours truly,

PATRICK E. MACGREGOR.

"Ye Ancient Bell Hotel," Maidstone, Kent.
Oct. 7th, 1890.

NUTMEGS.

An old planter writes:—

"I do not know much about nutmegs. The climate of Hanwella would I think do very well and the soil might be suitable and perhaps those portions with an easy slope might be got to grow them.

"This product wants great care for 4 years, the plants requiring side shade removed every six months. —— planted 800 plants near Kurunegala and had them shaded with cadjans, but their growth was very slow. It is now 7 years since he planted them, but I have not seen them for 4½ years. He planted also 300 cloves. I will write to the present owner and inquire how they are."

SOME CURIOSITIES OF THE TEA TRADE OF CANTON.

Mr. Alabaster's report on the trade of Canton for the past year contains references to some odd features of the export trade. Eighty thousand pounds of human hair, valued at £319, appear in the returns, and the Consul wishes it did not, for, as the greater part of it comes from the heads of beggars, criminals, and dead persons, it is not pleasant to think that it is worn by ladies at home, even though it goes through long processes of purification before it is made up into wigs, chignons, waterfalls, &c. The demand for what are called old silk embroideries is unabated; in fact, the majority of these garments are not old, but soiled, and the Chinese must look on the purchasers much as we should regard collectors of discarded teagowns or worn-out tennis suits. "It is true, much of the embroidery is very beautiful, but the association of ideas is not pleasant." The "scented tea" of Canton is the only branch of the China tea trade which the Indian cultivators cannot imitate.* The trade in matting is increasing; last year 228,929 rolls, valued at £123,957, were exported, chiefly to America, where it is largely used for carpets, and in a dry, hot climate nothing can be cooler, cleaner, or better; but it is not so suitable in damp weather, for it gets rapidly mouldy, and breeds fleas to an intolerable extent. An article of export which has come into prominence of late years is glass bangles, of which the value last year was £78,202. These bangles are exported chiefly to Bombay, "and it is strange that Canton should supply a British province with glassware." Brass buttons, 560,000lb. in weight, were exported. The manufacture was introduced by foreigners, but has now passed into native hands. "Buttons are the jewelry of China." The magnitude of the export of fans from Canton is shown by the fact that 11 ½ millions were sent through the Customs in the course of the year. The majority are simple palm-leaf fans, and go chiefly to America, where their lightness and cool appearance have brought them into great favour. For decorative purposes Canton fans cannot compete with Japanese, and for artistic beauty the Canton paper fans are surpassed by those of Foochow and Shanghai; but the feather fans made from the quills of the wild goose are strong, useful, and cheap. Preserved ginger, chowchow (a mixture of ginger, bamboo,

* We do not see why it could not be imitated if there were a sufficient demand for it. In the paper on tea which Mr. Brace contributed to our columns, there is a long list of plants, the blossoms of which could be used to flavour tea, and we have heard of a lawyer-planter in Ceylon treating his lady friend to tea perfumed with rose leaves.—ED. *T. A.*

oranges, &c.), cumquots, or little oranges, were exported to the extent of over three million pounds, valued at £41 137. In the interest of little boys at home, the Consul thinks it could be wished the export were larger, for, although the ginger may not be as pungent as that of the West Indies, the preserves are wholesome, agreeable, cheap, and, as far as the leading firm of Chyloong is concerned, cleanly made. As to Chinese medicines, peppermint oil and rhubarb have established their fame abroad, and when better known Pu-êrh tea will probably take the place of senna, as it is equally effective and far more agreeable. Of general medicines 2,992,533 lb. were exported last year, exclusive of special drugs, and 2,088 cwt. of pills. Another Canton speciality is teapots enclosed in wadded rattan cases. "They are not particularly handsome, but for a traveller, who wants to take a warm cup of tea to solace him during a long railway journey, they are invaluable, as they keep the tea warm for a considerable time, and keep the teapot from upsetting or getting broken." Woollen blankets, as an article of import, are increasing; white blankets are naturally not greatly in demand in a country where soap and water are rarities, and blue, being suggestive of a funeral pall, are not in favour; but every passenger by night boats seems to have a red blanket. Otherwise woollens are used chiefly for uniforms and table and chair covers. Gloves are not in demand, for the long nails are endangered by them.—*Times Weekly Edition.*

RATS DRIVEN INTO COCONUT TREES BY MONGOOSES.

Under this heading the *Jamaica Gleaner* reports evidence taken which goes to prove that the mongoose, introduced to destroy the cane rats, has become almost as great a plague in Jamaica as the rabbit is in Australia. As a sample of the statements made, wo quote as follows:—

The Commissioners met at Headquarter House yesterday at 11 o'clock. The first evidence taken was that of Inspector H. Thomas of St. Thomas:—He said that the mongoose had destroyed all the quails in the district, all the poultry, and had destroyed the booby duck in the high mountains and blue dove. They killed the black crabs which were always to be found in the swampy lands. They had driven rats into the coconut trees, but he could not say if they were the cane piece rats. It was common to see the rats eating the coconuts. He has seen the mongoose climb trees like a cat. They were fond of fruit, especially the naseberry and mango. The small settlers were anxious to get rid of the mongoose. He had recent cause to believe they devoured their own species and had proved this by trying a dead one and watching and seeing a mongoose come for it and cut the cord to drag the dead one away. He believed they colonized, at one time you would see large numbers, and if persistent efforts were made to destroy them they would go away and come back again. He thought the male forraged while the female remained at home. He had been assured by penkeepers in Hanover that newly born calves had been attacked and killed. At Shettlewood Pen the overseer had told him that more than one newly born calf had been found with his throat cut and this was attributed to the mongoose. Pigs were destroyed in the same way. He never heard of them attacking infants. The peasantry could not preserve their poultry from them. He had 80 chickens destroyed in three weeks by the mongoose. He had known one to attack a rooster in the bush. The mongoose was averse to cross an open space. They bred in hollows of stone wall and penguin fences. Sharp dogs would keep them away. He knew a gentleman at Yallahs who caught 150 in a month. For a fair amount 1000 could he trapped in a month in his parish. He thought to get them trapped it would be better to give 1d per head or tail rather than only accepting them at that rate in exchange for taxes. He did not think people had more rats in their houses now than formerly, and had not noticed any diminution in the number of john-crows.

George Nethersole said: They did much mischief: He could not raise fowls. They drag cocoa from the grounds and eat the corn, breadfruit and red peas, green corn and plantains. Had never seen them eat cannes. The rats were as numerous as ever. They eat coconuts. Had never heard of a mongoose attacking children. They had destroyed the snakes.

Mr. J. P. Walsh thought the ticks should be attributed to the mongoose as they had destroyed the blackbird, the great tick eater. He had seen mongoose among the crows on the beach eating fish offal but had never seen a black head crow—these were the young ones. Had seen john-crows eggs broken and thought it probable they had been eaten by mongoose. In a short time he believed there would be no crows left as scavengers. The poor people complained they could not pay their taxes because the mongoose ate their poultry. Fowls that used to be 4½d per lb. were so scarce that people had to pay now 9d to 1s.

Mr. E. S. Salmon said the mongoose destroyed poultry, climbed banana trees and ate ripe bananas and pines.

WYNAAD PLANTERS' ASSOCIATION.—At the general annual meeting held at Meppadi Reading-room; on 1st Oct. 1890, there were present, Messrs. Abbott, Atzenwiler, Hockin, Jowitt, Lamb, Mackinlay Malcolm, Morres, Powell, Puedzieux, Taylor, E. Trollope and G. Romilly, Hon. Secy. Mr. J. R. Malcolm in the chair, and the Hon. Secretary read the annual report, from which we make extacts showing how the Wynaad planters complain of want of labour and how they deem their prospects not very bright:—

The great question of the year has been the want of labor. Many Mysore maistries and coolies have not come in, owing it was said to the prevalence of influenza in their villages. The same reason has been given for the desertion of the Tamils, but in this case it is without doubt the fact that many maistries under advance to planters in this District have taken their coolies wholesale to Coorg. They unfortunately realise that owing to the rulings of the High Court with regard to Act XIII. of 1859, they can do this with impunity. Unless the maistry can be caught before the expiration of the term of his contract, (which he takes good care to prevent) he escapes without any punishment. If he is caught, he is merely ordered to fulfil his contract and thus given another chance of escape. We have appointed a committee to inquire into the grievances of the district owing to this useless Act and we hope that by a combined representation on the subject from all planting associations, we shall get Government to acknowledge the disabilities under which we are working and to grant us redress. Last January we requested Government to send an expert to report on the great mortality of Cinchonas throughout the district. Mr. Lawson the Director of Government Cinchona plantations was at once sent. He has reported that there is no specific or infectious disease, but that in his opinion the mortality is due to starvation. Unfortunately the mortality continues even in well-manured fields. As to our prospects I fear that notwithstanding the present high prices, the outlook is not bright. A terrible attack of leaf-disease has succeeded a very short crop, and Cinchonas in many parts of the district are still dying wholesale. Notwithstanding the letters that periodically recur in the newspapers, everything that science can do to determine the character of the Hemilia Vastatrix and everything that science could suggest to arrest its progress, was tried years ago in Ceylon, and yet in the face of science the disease has practically driven coffee out of the island. Now for the first time we, here, are realizing the possibility of such a danger. In Ceylon they turned their abandoned coffee lands into tea and prosperity returned. Here though we have abundant proof that tea will thrive luxuriantly, where both coffee and cinchona fail, owing to an apathetic Government we cannot command the labor. We have not sufficient even for our coffee; and tea requires double the quantity. So that unless we can get legislation to assist us without delay in enforcing our labour contracts, the end will be that we shall have to relinquish the land, in which we have sunk many lacs of rupees into the hands of a short-sighted Government with diminished revenue.

HILLCOUNTRY PLANTING REPORT.

A SOUTH-WEST RAIN-STORM—FOREST AND RAINFALL AND GOVERNMENT RESTRICTIONS—A MORE LIBERAL POLICY REQUIRED—IMPROVED PREPARATION OF CEYLON TEA.

NANUOYA, Oct. 28th.

To revert to the question of forest and rainfall in mountain regions and the regulation prohibiting the sale of lands above 5,000 feet altitude, I take it for granted that the prohibition does not extend to the vast stretches of upland prairies, which are treeless or nearly so. And as regards forest land above 5,000 feet elevation, which all the remaining forest on the dividing ranges is, I strongly deprecate any hard-and-fast rule. Ever since my attention was attracted to the subject by a deputation from Kataragama when I was pioneering in Uva (half-a-century ago!) requesting me to spare the mountain forest for the sake of the sacred river, my opinion that, in mountain regions at least, the denudation of forest has not the slightest effect in diminishing rainfall has been but strengthened with the efluxion of time and the results of reliable observations. I was sorry to see a man like Mr. Moir, in his report on the Walapane distress giving currency to the proposition that the clearing of forest by planters had lessened the supply of rain for the paddy fields. There are regions of recurring drought on the outskirts even of mountain regions, owing to the position of such localities with reference to the monsoon currents; and all the records available show that in all history Walapane has experienced the effects of being situated in such a region. Mountains are nature's great agencies for cooling moisture clouds and currents and compelling them to part with their contents. But there are in Ceylon as in India portions of mountain ranges beyond the reach of our greater monsoon, the south-west, and from which, by topographical features, even the currents of the north-east monsoon are either deflected or have been previously deprived of their moisture. On the rainfall in such regions the process of felling forest about 40 feet high and substituting cultured plants about 4 feet in height, within a good many cases, cultivated trees of taller growth (cinchonas and timber trees, for instance), cannot have, and we know from extended observation has not had, any diminishing effect. There is more to be said in favour of the statement that the denudation leads to floods and the deposit of silt. But any tendency in the direction of floods is very largely counteracted by the tillage which the soil receives on estates and which renders it specially absorbent of moisture. One of the greatest floods in the Kelani river in modern times took place in 1837, when only a few hundreds of acres had been felled of the vast tracts of forest at its sources and along its course. Silt in rivers and streams is speedily disposed of by scour, and in the rare cases where paddy-fields lie beneath European plantations (there are no such cases in the region whence I write) damage by silt to the former could easily be obviated by the cutting of a trench between the two. This might be rendered imperative on the planter, instead of the course now frequently pursued of refusing to entertain applications for forest land, the clearing of which may possibly lead to damage of rice lands by descending silt. By all means let us have forest and fuel reserves in reasonable proportion and within reach of railways or other means of communication. And let rice cultivation be duly protected and encouraged. But surely it is an unwise policy to restrict further extension at high altitudes of the one enterprise on which the prosperity and progress of Ceylon so overwhelmingly depend. In the region around me as I write there are elevated ranges connected with such mountains as Pidurutalagala, Kirigalpotta, Totapala, &c., which ought not to be invaded by the clearing axe and with which no planter in his senses would tamper. But below these, at from 5,000 to 6,000 or 6,500 feet, are vast expanses of forested valleys, hollows and ravines specially suitable for tea culture and which cannot be utilized as reserved forest or fuel for the railway, owing to their distant and secluded position. If blocks in such valleys were laid out for sale, proportions of patana land being added for the growth of timber trees, there would be room for expansion of enterprise, culture and population; means of communication being provided under the operation of the Branch Roads Ordinance. To say absolutely that no land above 5,000 feet will be sold, is to say to progress in Ceylon "Hitherto shalt thou come and no further," and to divert capital and enterprise to lands which are our rivals in the production of tea: And this at a time when Ceylon tea is, above all others, finding favour in the markets of the world, and when its culture and preparation have come to be so much better understood than ever before. Apart from such details of manufacture as leaf-sorting,—first a light rolling of the leaf, succeeded by a heavier; the provision of "roll-breakers," and drawers for "fermentation";—planters now understand that the first flushes after pruning yield weak tea. Arrangements are, therefore, made for having fields of pruned and unpruned tea in due proportion, so that the leaf from each may be mingled. Then, at high elevations, it has been found that bushes can be plucked for two years in succession without being pruned, provided the previous pruning was low enough to prevent a tendency to blossom and leaf. In these directions and others knowledge has been obtained and improvements made calculated still further to add to the high quality of our tea and to the earnings of "poor but industrious planters."

DARJILING AND TERAI TEA SEASON.

Since the deluge, or more plainly speaking, since the heavy rains, there has been very little to record in favour of the tea prospect. The weather in the district has undoubtedly improved but beyond that the tea manufacture continues very much in the same groove that it did when things were in a perpetual state of mildew. As to the future it is very difficult to foreshadow the results of this season's working, but from recent accounts the hill gardens have considerably improved in quality of outturn. This is gathered from the last London market sales to hand, which show prices not only better than usual, but far exceeding those obtained last year for the same quality of tea. Although the hill gardens are favoured with what one might call tea-making weather just at present, the season is too far advanced for any material change to take place as far as quantity is concerned, and it is feared that many will close with a very short crop. There is, however, a chance of the season being late, with this wild weather. In that case it will be a considerable help to those who suffered the most from the effects of the spring drought.

The Terai gardens have had an unfortunate season all round. To commence with, they required moisture: this was followed by excessive rains in the hills flooding the rivers, and for two months many of the gardens in the plains were entirely under water. So, practically speaking, the factories have almost been closed for the latter half of the season. As soon as brighter weather favoured the place, it became enveloped in an overwhelming blight such as has never been known in the Terai, and there is very little chance of matters improving at present.

One or two of the gardens have done better than others, but on the whole the season will be a deplorable one to proprietors: some say that many of the small estates will close at the end of the season for want of financing. It is very difficult for small factories to exist in a place like the Torai. The climate is such that few proprietors would care to settle down in it, and the price now obtained is not sufficient to secure good management; consequently those places started in better days, have not a very bright future, unless amalgamated with each other to ensure good management at a minimum expenditure. It is estimated that the crop is twenty-five per cent. less than usual, some of the factories being as much as fifty per cent short of the outturn. Several changes in the managements are pending, both in the Terai and in the Hills. This is poor satisfaction to the proprietors, but it seems to suit some people to be in a constant state of change.—*Correspondent of Calcutta "Englishman."*

AFFAIRS IN MADAGASCAR.

Writing to the editor of the *Tropical Agriculturist*, the editor of the *Madagascar News*, in a letter somewhat similar to one from which we published an extract some time ago, says :—

"Madagascar is on the eve of a great development of her vast pastoral, agricultural, and mineral resources, and that the course of events here during the next few years will doubtless be of interest to you, especially as the resources of this island are very similar to those of yours. Beyond that, however, there is the French policy here to follow, the result of which were those directly associated with the Government cannot today forecast. Her Majesty the Queen, the Prime Minister, and the Court have been in the forest country ever since the Anglo-Franco Convention began to be negotiated, and the few people remaining in town are embodied with the Government; the town, however, desires peace at any price."

COCONUTS AND CINNAMON.

Kadirana, Oct. 30th.

It is a trite saying that all things come to those who wait; and to us at last has come the long delay, and therefore all the more welcome rain. Since the 26th it has rained every day with only short breaks of rest, but the rain till last night was so gentle that not a drop ran off the ground; during last night, however, the rain was very heavy, and the gauge measured 3·30 inches. The total for four days is 6·81 inches. There is a marked absence of electric disturbance. Gladness is in all hearts, but as for thankfulness that can come from only the Christian or the theist. The Buddhist can feel none, for to him there is no one to be thankful to except perhaps to himself; for must it not be due to his own good deeds—Karma—in some previous birth that the rain has come when it did! It strikes me that there must have been a good many whose merit is pretty equal to bring down the rain almost everywhere just at the same time! How would the Buddhist account for its falling equally upon the bad?—A bud is showing on the cinnamon, and will be well out in a few more days.

TEA IN FOOCHOW.—The news of the large settlements of tea during the last month have produced some sensation in the principal districts in the country, but owing to the lower range of prices offering they prefer to leave the leaf to grow old instead of picking it. It is believed by growers that a clean picking off of the leaf every year does harm to the plants, and that the short picking of last year has greatly added to the strength of this season's tea in the cup; for this reason, coupled with the low prices, they almost unanimously refuse to pick any further quantity, so the supply for the season may now be computed at no larger amount than 370,000 chests.—*Hongkong Daily Press*, Oct. 14th.

PLANTING AND NEWS REPORT FROM PANWILA DISTRICTS.

EXCELLENT TEA AND CACAO PROSPECTS—CARDAMOMS, PEPPER AND VANILLA—ABUNDANT LABOUR—ROADS.

WATTEGAMA, 30th Oct.—I am glad to say we are not in the same position as "Eldorado" having all our cacao trees dying out, but, on the contrary, we shall all have an excellent crop this year and our trees look very healthy and fit to bear better crops as they get older.

We can safely rely on our 400 lb. per acre made tea from all estates which are properly cultivated in our district.

Cardamoms, pepper, and vanilla, are doing well. Labour abundant and cheap. Our District Engineer is giving his full attention to the roads, but the *shaving* system at present in use though good while there were lots of old metal 9 to 12 inches thick on the road will soon show the mud. There are several patches now on the road from Katugastota towards Galagedara where the cart wheels turn up the red soil. We now require a thick layer of good metal put on our roads, as the island can afford it and not wait till the last metal is shaved off. We also require better metal. Metal heaped on our roadsides (not by our present engineer) grows weeds and grass freely, thus showing the earth mixed with the stones and softness of latter.

THE CEYLON "AMERICAN" TEA COMPANY.

The following extract from a letter under date New York, Oct. 3rd, to the Hon. J. J. Grinlinton from Messrs. Wattson & Farr, gives a most encouraging account of the start made by the new Company :—

"The new Company began operations this week, and we already have had most encouraging success in obtaining a most excellent agent in Boston, and it is probable he will take the agency of the whole new England States, in return for which he will, of course, take a considerable number of shares. He is active, energetic, very well connected, and we are most fortunate in having gotten his co-operation. Several other promising agents are considering the business. We send you under separate cover copies of the first advertisements, which are quite striking, as you will see. We enclose herewith copy of the byelaws of the Company. The State Trust Company whose President, Mr. Willis Paine, you called upon, has voluntarily asked us to make them our transfer agents, which brings the Company another strong endorsement. We feel more and more that the Company is necessary to the prosperity of the planters, and we again ask your best efforts to secure for the Company the hearty co-operation of the planters in Ceylon."

THE ODOROUS EUCALYPTUS.—No worm or insect is ever found upon the eucalyptus tree, or in the earth where the roots penetrate. A row of trees planted through an orchard or vineyard will cause insects, worms, and caterpillars to vacate that region. Two branches of the eucalyptus used in the room or windows, or as decorations in dwelling rooms, will cause mosquitoes, moths, fleas and flies to leave the premises.—*Indian Agriculturist*, Oct. 11th.

A CEYLON PLANTER IN SOUTH AFRICA.—The movement of the British South Africa Company's expeditionary force should be watched with considerable interest upcountry, inasmuch as the Company counts amongst its members a Ceylon planter well-known in Dikoya and Haputale—Mr. L. L. B. Dykes, who went home more than a year ago. Mr. Dykes was one who liked an adventurous life, and he seized the opportunity when at home of offering his services to the organizers of the expedition and was gratified to find them accepted.

PADDY CULTIVATION IN THE EASTERN PROVINCE.

IMPORTANT EXPERIMENTS AND PROFITS UP TO R26 PER ACRE, OR 130 PER CENT.

Colonial Secretary's Office, Colombo, 31st Oct. 1890.

The Editor of the "Ceylon Observer."

SIR,—I am desired to transmit for your information the annexed copy of a letter addressed to the Director of Public Instruction showing the results of the agricultural experiments conducted in the Battioaloa district, under the supervision of Mr. E. Elliott, the Government Agent.—I am, sir, your obedient servant, H. L. CRAWFORD, for Colonial Secretary.

EXPERIMENTAL PADDY CULTIVATION.

Battioaloa Kachcheri, 13th October 1890.

Director of Public Instruction, Colombo.

Sir,—In continuation of previous reports as to experimental paddy cultivation under the supervision of instructors furnished by you, I have the honour to state that during the past eight months I have carried on cultivation on a somewhat extensive scale, with a view of discovering what is the real cost of raising paddy with hired labour on land, the water supply of which is in ordinary years fairly assured, and working with *unborrowed* money.

2. For several reasons, I decided to work in three localities and accordingly secured 35 acres at Nintavur in Batticaloa South, 26 acres at Ampilanturai in Batticaloa centre, and 23 acres (in two parcels) at Eravur in Batticaloa North, making a total of 84 acres. The cultivation was supervised by three different instructors, who worked perfectly independent of one another. The year has been a most trying one owing to the very short rainfall of the north-east monsoon and the long subsequent drought which is almost unparalleled in the annals of the district. Tho consequence is our cultivations suffered in common with those of our neighbours, but even in our failures we have learnt useful practical lessons and established that the improved mode of cultivation possesses a distinot advantage even in periods of drought. At Nintavur alone was there a fair water supply and the results are satisfactory, though we should certainly have had a bigger crop of the season had been an ordinary one. At Ampilanturai the water supply ran out early and at Eravur the irrigation available for one parcel was very short, and failed almost altogether in the other case.

3. As Nintavur is the only part of the extent which has had any fair play, I give in the annexed statement full details of the expenditure and may add this has been carefully audited for me by Mr. Morphew. It is, I believe, prepared on strictly accurate principles of accounting and includes 20 per cent depreciation. on the improved ploughs (iron) besides cost of new shares (which only last one cultivation it is found). The total outlay was R702·09 for the 35 acres (inclusive of Government tax and headman's fee) and the crop was 152½ avanams (or 1140 bushels) of *well cleaned* paddy. Half the crop was sold at public auction in my presence for R10·75 per avanam, and purchased by an outsider. (The rest was retained for agricultural purposes). The whole crop was consequently worth R16·16 or R1·42 per bushel. This is higher than paddy usually sells for in the locality, but it was excellent grain well cleaned and the actual sum realized is hardly above what the crop would have brought in an ordinary year and at ordinary prices. (We got 44 bushels per acre last year off 7 acres of this field, against under 33 this year.) So I think we are justified in taking the actual amount realized as a measure of success, not out of the usual run; the higher price only compensating for the shorter crop due to an unfavourable season.

4. Tho cost of production was 17½ rupees per acre or under 54 cents per bushel of crop, and Government tax &c. was 8 cents per bushel moro, making a total of 62 cents per bushel *in an unfavourable year* when paddy is selling at R1.50 per bushel in the same locality at *harvest time*. The net profit was R26 an acre or R914 against an expenditure of R702 in eight months or 130 per cent on that outlay. The rent agreed to with the landlord was R220 or about 11 per cent on the present selling price of the land, leaving the cultivator R694 profit on an expenditure of R702 or nearly 100 per cent. If the proprietor and cultivator were the same person his profit would be over 32 per cent on a capital of R2,800, which represents the selling price of this land plus the capital necessary to work it.

5. From enquiries made on the spot I am informed most of the lands in the tract gave only a crop of 15 to 18 bushels per acre, but some 70 acres gave 22½ bushels and 30 acres lying lower and considered the best in the vaddai gave 26 bushels. The improved tillage can consequently be credited with 10 bushels worth R14.

6. This is really the only experiment which advances our knowledge of the subject, but that equal publicity may be given to the less favourable results due to the untowardness of the season. I give the figures for the other stations, which are as follows:—

Station.	Extent cultivated. Acres.	Total crop. Bushels.	Total Expenditure. R.	Total Income. R.
Ampilanturai	26	187½	302	225
Eravur Munmari	16	262	306	320
Do Kalavellanmai	7	64	131	99
	49	513½	739	644
Add Nintavur	35	1,140	702	1,616
Total ...	84	1,653½	1,441	2,260

From this table it will be seen the net profit on all 4 transactions was R819 on an outlay of R1,441. The cost of production including Government tax and headman's fees is 87 cents per bushel of paddy at a time it is selling for R1·50. This is about as crucial a test as could be applied to the industry. It is said that these experiments have no value, as they are undertaken under circumstances very different from those attending the ordinary cultivation of paddy. To this I would reply that they are important in the first place in arriving at the actual cost of production, and so being a check on the fanciful estimates which appear in the public prints, and even at times in State papers such as the appendices to the recently published report of the Grain Tax Committee. Undoubtedly no private cultivator in the island expends anything like the amount the instructors have done per acre, nor I suppose do they get an equal return. I doubt if any one spends more than R10 per acre and for this he obtains in a fair land a return of 25 to 30 bushels of paddy worth generally as many rupees. In poorer lands loss is spent, but the return is as a rule in proportion in ordinary years, where irrigation is available. Of course where this is absent the industry is liable to greater fluctuations according to the rainfall and its distribution. I would in this connection call attention to the remark made in my report of last year.

7. There are some collateral points of interest brought out by these cultivations which deserve to be recorded. The advantages of transplanting were specially marked at Eravur where the water supply was very short, the transplanted portion having yielded 13¾ bushels per acre against 8½ of the broadcast, while the additional cost of the process is under R1 per acre. If we had only transplanted the whole 7 acres in this portion we would have made profit! On the other land at Nintavur where the water supply was fair, the difference was very small; but the outlay on the transplanted area was slightly less than on the broadcast owing to the saving in *seed* paddy and the difference is only about R1 per acre in favour of transplanting.

8. At Ampilanturai though we only got 7½ bushels per acre, the adjoining land owners only got 4¾ and at Eravur we got nearly 16 bushels per acre against 11 secured in the neighbouring fields.

9. At Nintavur, a small quantity of lime (40 bushels costing R4) was scattered over the land with the seed; and owing to this, the Agricultural Instructor thinks it probable the crop was exempt from the

ravages of caterpillars which infested the rest of the tract.

10. The iron ploughs used were some I got from Messrs. Massey & Co. of Madras, which cost R8 and R6 in Madras and about R1 more to bring over by native vessel. The cheaper plough (known as the Ryots) did very fair work, and is well suited for the light cattle of the country, but wants strengthening in the elbow; the shares are detachable and a new one cost 75 cents.

11. As I was on the last occasion charged with omitting to make provision for watching and fencing, I think it well to explain that at Niutavur there were five permanent labourers (*i.e.* one for every 7 acres) engaged for the whole cultivation, who did all the watching and fencing as well as the ploughing, ridging, irrigating and sowing, in addition to helping in the reaping at a cost of R266·50. Additional labour was taken as required for reaping, threshing, stacking, etc., which was paid for in money. Similar arrangements were made at the other localities.

In conclusion I have to intimate that I propose again undertaking cultivation of the same extent during the coming season.—I am &c.,

(Signed) E. ELLIOTT, Govt. Agent.

Actual outlay in the cultivation of 35 acres of paddy land at Nintavur in the Batticaloa district under supervision of Mr. Chelliah, Agricultural Instructor.

IMPLEMENTS.

	R	c.
5 English ploughs, cost of renewing shares at 75 cts.	3	75
Depreciation on cost of ploughs at 20 per ct...	6	00
4 Native ploughs do do do at do ...	1	00
Mamotics (provided by labourers and included in their hire), baskets and bags	4	50
	R15	25

SEED PADDY.

For 30 acres, broadcast	80	85
5 ,, transplanted	1	40
	R82	25
Ploughing, ridging, irrigating, fencing, watching, sowing, etc., all executed by hired labour at cost of	255	30
Buffalo and bullock hire	117	00
	R372	30
Transplanting 5 acres, cooly hire	13	04
Manure lime	4	00
Reaping, stacking and threshing		
Hired labour	117	00
Buffalo hire	9	00
	R126	00
Total cost of actual cultivation...	R612	84

MISCELLANEOUS CHARGES.

Vaddai Vidhan's hire	9	25
Government tax	80	00
	R89	25
Total expenditure...	R702	09

NUTMEG CULTIVATION.

(*From a Correspondent.*)

"Old Planter" is quite right—nutmegs will thrive all along Hanwella on both sides of the river's banks, and do thrive splendidly, judging by the specimens I have seen in a headman's garden in a village just opposite the 15th milepost on the Hanwella road, on the other side of the river and close to its banks. I have also seen nutmegs grow luxuriantly along the banks of the lake at Bolgoda. There is no doubt that nutmeg plants must be well shaded and tended (watered during the dry season) for at least about 3 years after planting, after which it is all right. I believe that mangosteens will also thrive in the Howagam Korale, and would suggest to the present Mudaliyar the advisability of applying to Government for 100 plants to be distributed in his korale. The present young Mudaliyar of Siyane Korale West has with his usual generosity distributed a good many mangosteen and other valuable fruit plants throughout his district to all such landowners as he deems deserving, irrespective of caste and creed; and not only this, it is well-known that valuable breeding bulls were generously lent by this young gentleman to those in his district who needed them, and this good example may well be copied by his brother Mudaliyars. Nutmegs are said to thrive wonderfully well at Weke, where this Mudaliyar has a good many trees to show in his superb coconut estate which is the admiration of all who see it.

PLANTING IN MAURITIUS.

(From the *Merchants and Planters' Gazette,* Oct. 11th.)

SUGAR: THE WEATHER AND THE CROP.—Manipulation is being carried on with great activity on all the estates of the island. The yield is sufficiently satisfactory although inferior to that of last year in certain quarters. According to the results obtained up to this day, the total production will be inferior to that of last year.

VANILLA.—The market is entirely bare of fine qualities. The products of the new crop will not appear on the market before the end of this month. We entirely confirm our last valuation as regards the total outturn of the coming crop which does not exceed 14,000 kilos.

The following quotations are nominal:

	per kilog.
Vanilla 1st quality	R18 to R20
do. 2nd ,,	16 to 18
Vanilloes	8 to 10

ALOE FIBRE.—100 bales of good quality have been taken for Australia at R250 per ton. There would be takers at the same price for Europe but the fibre is scarce, holders ask for higher prices.

FREIGHTS.—The following are the quotations of the day:

London...27/6 to 30 and 5 o/o N.

THE FINANCIAL POSITION.—It appears from a financial statement placed on the table of Council on Sept. 23rd that the receipts since the 1st January amounted up to the 30th July 1890 to R4,030,488·41, the expenditure during the same period to R3,389,378·75, leaving a balance of R641,109·66 in favour of the Treasury.

COFFEE.—Since our last, arrivals having succeeded, prices for both Good Ceylon and Rénnion have decreased and are selling at R59 to R60 and R60 to R61 per 50 kilos, respectively. We quote mixed "triage" qualities from R35 to R50 per 50 kilos, according to quality.

GEMMING IN RAKWANA.—We learn that there is very considerable activity shown in sinking gem pits in the vicinity of Aberfoyle estate. In one case a shaft has been sunk for 100 feet and the "illan" has been struck so freely that profitable results are anticipated. This is a pit carried on under European auspices, Mr. Siedle being Colombo agent and Mr. W. Home, the pit manager. Close by there is an equally deep pit belonging to Mr. Fernando and another to an enterprising Moorman. The efforts of some of the practised native gemmers to mystify the Europeans as to the "illan" are described as very constant and persevering. Such native experts hope that their European superiors not finding the long-expected illan at 40, 60, 80 or 100 feet may abandon the pit and go to work elsewhere, when the abandoned shaft would be very speedily taken up and worked out by a native confederacy.—We are told that the value of £1,000 put on a week's findings of stones at Rangwellatenne is an exaggeration; at any rate that the Company would be very glad to accept that amount for the gems they have so far secured.

LIBERIAN COFFEE.

AN ADDRESS BY HEER H. J. WIGMAN TO THE BATAVIAN ASSOCIATION OF AGRICULTURE, AT A MEETING HELD AT BUITENZORG ON THE 23RD JULY 1890.

(Translated for the "Tropical Agriculturist" from Dr. H. J. Wigman's Address, by John Dent Young.)

It cannot be too strongly urged, that in colonies such as Java the prosperity of the natives and colonists depends in a great measure on the cultivation of the soil. Should the prosperity of agriculture diminish—whatever may be the cause—the evil results are immediately felt throughout the length and breadth of the land. In countries where commerce and manufacture have reached a high stage the inhabitants may have made themselves less dependent on the soil; here we have not yet attained that point. A few years ago agriculture underwent a fearful crisis, from the effects of which we have not yet quite recovered. Such circumstances are not strange in the history of agriculture in most countries; generally it emerges from them with renewed vigour. It then becomes the question whether by a better system of working, and by more rigid economy, it be possible to continue the competition with other countries, or whether it be inevitably necessary to abandon the existing kinds of cultivation and to seek for others. An example of this last we find in Central Europe, at the time when America flooded the European markets with her colossal importation of corn, causing the prices to fall to such an extent that in some countries, notwithstanding the most strenuous efforts, the corn growers found it impossible to continue the competition. Especial duties were levied on imported grain for protecting native industry, but in spite of all efforts to sustain a kind of factitious prosperity, it was only in very favorable circumstances that such cultivation could be carried on.

Many looked round in search of other products to cultivate. In lands suitable for cattle breeding, this industry was extended. England chiefly led the way in cattle breeding; elswhere so-called *minor products* were tried. A large portion of former corn fields are now planted with beet-root for sugar making, and it is this cultivation that wages a life and death struggle with the tropical sugarcane. Another of our staple products is more directly threatened by America: the enormous quantity of coffee exported thence caused a considerable fall in price a few years back, and although at present the article has recovered a satisfactory value, still the position of the produce here is attended with anxiety, all the more on account of the leaf-disease and the "jamur upas" which persevere in their work of destruction.

It causes no wonder that agriculturists and those who are interested in cultivation use their utmost endeavours to bring about a better state of affairs. That matters are now very much better than they were a couple of years ago cannot be doubted. Of one of the branches of culture which was introduced during the disastrous epoch alluded to, which has every chance of being greatly extended, I now purpose more fully to speak, it is the Liberian coffee.

Here I must unavoidably refer to what I have already written in the "Teysmannia" under the head of "Notes on Agriculture."

As the name indicates, this kind of coffee has its origin in Liberia, a negro republic, founded by an American philanthropic society, which purchased the freedom of seventy thousand slaves, and sent them from America to the coast of Upper Guinea.

The Republic now counts 215,000 inhabitants; it does not yet go well with them, and that their condition is in a great measure the fault of the liberated slaves, appears amongst other proofs from the wasting neglect of the splendid kind of coffee which is there indigenous.

It is only in the uttermost need, so tell us travellers who have visited Liberia, that the negro goes into the forest, there gathers ripe and unripe coffee just as it comes to hand, and dries it in the most careless manner. Such coffee used to be taken to London in small lots, and as it had (not without justice) earned a bad reputation, it was generally disposed of at very low prices. Latterly, more care has been bestowed on the preparation of the Liberian coffee, and its exported of good quality.

In a recently published work by J. Büttikofer, Conservator of the National Zoological Museum at Leiden, entitled "*Reisebilder aus Liberia*,"—Brill 1890, I find some particulars respecting the soil and climate which I now communicate. In the second volume of this work, which has not yet appeared, the cultivated plants are to be treated of, and I hope later on to furnish you with full information on them.

The soil of Liberia consist for the most part of red clay ground containing a great deal of iron.

The only months free from rain are January and February—and even towards the end of the latter month the clouds begin to gather, thunder is heard rolling in the distance, till at length a tornado bursts with storm and rain. From this time to the end of March frequent storms occur; and still more often in April, when they happen almost daily. Vegetation had been in a state of summer sleep during January and February, when many of the trees and shrubs lose their leaves, is now wakened up by the powerful influence of the superabundant rains, and again assumes its magnificent attire, with the glories peculiar to the tropics alone.

This is the most favourable season for planting and sowing the fields; during the first two months of the year the labor of felling and burning off are performed, and in the first place rice and Indian corn are sown, which quickly germinate and spring up. In May the storms and squalls subside, and the regular rainy season sets in. The sky is constantly covered with dense clouds and rain falls almost without intermission; hardly a day passes without rain. About the middle of July the weather moderates and there is an interval of fine weather, and the harvest season begins, the rice and Indian corn are got in and dried as quickly as possible, as the second half of the rainy season quickly approaches and would render such work impossible.

All too soon the few fine days, the number thereof varying much in different years, come to an end and the rains pour down with redoubled violence. Indeed it can hardly be called rain; the water streams down from the atmosphere, day and night, at times for weeks together. The rills become great streams, whole tracts of land are laid under water, and most of the roads or ways become impracticable. Day after day the negro is as it were shut up in his hut, and forced to idleness he lives on the rice and maize which he has been able to store up under cover. Thus go by the months of August and September with almost continuous rain. In October the tornadoes begin again, in November the rains become less frequent, and during December they generally take up altogether.

The thermometer shows a mean temperature of 25° Celsius at 6 a.m., 30° at noon, and 29° at 6 p.m., at nights the thermometer seldom falls below 24°, and at the warmest weather it rarely rises above 31° in 1 p.m. When the magnificent species of Liberian coffee became better known, Dr. Scheffer, the then director of the National Botanical Garden here, made strenuous efforts to introduce it into this country. The Liberian coffee was introduced somewhat earlier into Ceylon than it was into Java; the well-known firm of William Bull, in London, obtained seed from Liberia and succeeded in getting it to germinate in their hothouse, and the plants thus raised were planted in Ceylon in 1873. In July 1874, the first Liberian coffee seed was brought to the National Botanical Garden by the intermediation of the Ministry for Colonies. I well remember the surprise which was excited here on the appearance of the fine large coffee beans when they were first shown here. The largest of these seeds in the parchment measured in length not less than 22 millimetres, and 12 in breadth. This seed was packed in two cases, one in dry sand and the other in charcoal; but in spite of all the care that could be taken in bringing them over, not one of the seeds germinated to the great disappointment of all concerned. Towards

the latter part of the following year (1875), we at last received two wardian cases containing 118 plants, which were landed here in the best possible condition.

These plants had first made the voyage from Liberia *via* the Cape of Good Hope to Netherlands; they were unpacked at the Leyden Hortus, and when they had somewhat recovered from the effects of their voyage they were replaced in wardian cases and sent by the steamer "Conrad" of the Maatschappy Nederland to Java.

The commander of the steamship was requested by the Government in Netherlands to bestow the utmost care on his valuable freight. I was in the roads when the "Conrad" arrived, and on the same day the plants were safely placed in the National Gardens at Buitenzorg.

These were the first live Liberian coffee plants imported here, and although we cannot now declare that all the Liberian coffee at present growing in Java derive its origin from those same plants, for since that time private persons have brought over further supplies, still such is the case to a great extent. In the early part of the year 1876, these plants were put out. As we knew little of this cultivation, the distance between the plants was fixed as usual at 6 feet. It soon appeared that the plants were much too close together, and the distance apart was brought to 10 ft., and even this space was afterwards found to be insufficient. The Liberian is now generally planted 12 feet apart, and yet it is found that the entire ground is so fully taken up by the roots, that it would be better to give them more room.

In the beginning of 1877 the first blossom began to show itself; it was then feared that the new sort of coffee would produce very little, as only a single blossom showed itself at each joint of the branch. Happily it was soon found that such fear was groundless, as an abundant show of spike speedily developed itself on every joint. The first crop of any importance was gathered in the Experimental Garden between the middle of June and the middle of August 1878. It is a curious fact that when this first crop was gathered, the trees grown under shade yielded 2½ pikuls per bouw, whilst those fully exposed to the sun produced 3½ pikuls.

The culture of the Liberian coffee is still new to us. We have yet to a great extent to learn it; there is much that we do not know, but of one thing we may rest assured, that is, that this kind of coffee has a great future in store for many. It suits itself in a wonderful manner to all kinds of circumstances. I have seen fine plantations on abandoned coffee lands, as well as in tea plantations under cultivation. This last fact, gentlemen, is worthy of remark, for it is well known that the roots of the tea plant permeate the soil in all directions like a net-work, so that there is literally not an inch of soil left free from their interlacing. Thus only a very strong plant can flourish in such a position.

I have seen thriving plantations of Liberian coffee at an elevation of a few hundred feet above the sea-level as well as at 2,000.

In 1875 researches were instituted in Liberia at the instance of the English Government for the purpose of obtaining information from the natives regarding the various circumstances in which this kind of coffee grew best. The particulars thus obtained were as follows:—

Liberian coffee grows as well in the immediate neighbourhood of the sea as in the interior, and it is cultivated at heights above sea-level varying from 10 feet to 550 feet. The variety which produces small berries bears fruit in 18 months. The large sort is preferred because the coffee it yields is of better quality and more abundant, although the first crop is not gathered until the third year, and in the more elevated districts the fruit is less in size.

Under shade the tree does not come on well, though the ground should be well covered by planting the trees close together, or by covering the ground with dry leaves, grass, &c. This is especially necessary for young plants. The distance of the plants from each other varies from 6 to 12 feet. Full-grown trees bear from 20 to 24 pounds of (dried?) fruit.

Until we shall be in possession of the second volume of Büttikofer's work, we are unable to say how far the above information can be relied on. The writer just named passed two years in Liberia, and is in every sense of the term an observer who may be depended on.

As regards shade it is an established fact that Liberian coffee here requires shade. As I have previously stated in the "Teysmannia," the first plants were divided into two lots, one of which was put out in the open and the other under shade of the *Albizzia moluccana*. They were in all other respects similarly circumstanced. Those that were exposed to the full force of the sunshine at first did better, they grew more quickly, threw out branches lower done, and when three years old yielded one pikul per bouw more than the others. Then they began to shew signs of weakness, especially after a second good crop; they deteriorated perceptibly, became sickly, and the "jamur upas" and leaf-disease commenced their devastations, and if the necessary shade was not speedily supplied, certain decay soon followed.

Why it is that Liberian coffee succeeds so well in its original habitat without any shade, whilst here we learn from experience that shade is indispensable, has not yet been explained. For in other countries, Singapore for instance, and elswhere in the Straits, no shade is planted on coffee estates.

Besides the experiments made in the State's Gardens at Tjikeumeuh, many planters have learned from experience that shade is essential. Although it is an established fact that here we must have shade, the best kind of tree for the purpose has not yet been ascertained. As had been proved in the State's Experimental Garden shade is not necessary for the young plants, for they are stronger when grown exposed to the direct action of the sun's rays; therefore a shade tree of quick growth is made use of and the coffee and its shade can be put into the ground at the same time. The trees most in use are *Albizzia moluccana* and *Erythrina* (dadap), and which of these is to be preferred depends on local circumstances. There are places where the dadap grows badly; inother localities the *Albizzia* has much to suffer from strong winds. Upon a large estate in a neighbouring residency the dadap did not grow well, and it was decided to plant the *Albizzia* here and there; this kept the ground cooler and the dadap was then planted with success. The latter must be lopped for the purpose of forcing it to shoot up to the required height.

Other trees besides these named are planted for the sake of the shade they afford,—the *Caesalpinia dasyrrhachys*, with which good results have been obtained, amongst other places at Dramaga.

These *Caesalpinias* which were discovered by the late Mr. Teysmann during a journey through the Lampong districts, and thence introduced into the National Experimental Garden, attracted the attention of the late Heer Zeper at Aardenburg (Soekaboemie). This latter gentleman published an account of the properties of these trees in the Journal of Agriculture and Industry (*het Tjidschrift voor Landbouw en Nijverheid van N. Indie*). The publication had for result that applications were made by a great many people for seeds for the purpose of experiments. The limited quantity of seed produced by the two trees of the kind in the gardens did not furnish sufficient to satisfy all the demands.

The native name of this tree in the Lampong districts is *Petah-Petah*, Petar or Pepetar. The Resident of the Districts named supplied some of the seed. The tree affords fine shade not too dense, and is stronger than the *Alb. mol.*, but its growth is by no means so rapid.

As regards the height above sea-level at which Liberian coffee can be profitably grown, as far as we have seen, it succeeds well up to the height of two thousand feet; but we are not in a position to say whether we can safely go higher than that. There certainly are here and there trees that thrive admirably up to 3,000 feet, and likewise yield a satisfactory quantity of fruit. And a planter in the Preanger Regencies informed me that he had determined on forming a plantation at that height guided by the luxuriant

appearance of some trees on the spot. But I would not venture to recommend planting at so great a height, as I have seen Liberian coffee growing at 3,400 feet above the sea, which I must say left much to be desired in developement, as well as in bearing.

Buitenzorg and its neighbourhood seem to offer a favorable climate for this kind of coffee. If you ask me, gentlemen, how Liberian coffee would fare in the of ten dry lower lands of East and Central Java, I must tell you that as is well known and as is stated in Büttikofer's work, the climate of Liberia is very wet, and although in this respect it resembles West Java, it is questionable whether it could hold out against a drought of six months and at times of longer duration. In the year 1877 there occurred an unusually long drought; even at Buitenzorg there was no rain for months; although the young Liberian coffee plants grew but little during that dry period, they suffered but slightly from its effects.

Great care is called for in the working of the soil. Generally speaking we are in the lower lying lands less favourably placed than in the mountain forest; lands, rich in humus, which has such a beneficial influence on coffee, and which is wanting with us. It is evident that we must supply its place by good tillage, drainage, and manuring; without these factors we shall not arrive at much. More than one Liberian coffee plantation has failed, because no sufficient allowance was made for the difference of soil.

In such matters it is impossible to lay down hard and fast rules; all depends on local circumstances. On level ground many will prefer having the whole surface dug up before planting, others content themselves with having holes dug for the plants, a method which may answer very well, provided that it be not neglected to turn over the ground well round the holes afterwards, or at least to loosen the soil to some depth, should the subsoil be inferior to that of the surface.

Drains are indispensable, and in deciding the distance between the drains the formation of the ground has to be considered, as the nature of the drainage required depends on that. Stiff soil naturally necessitates closer drains than does light soil. The manuring of the ground in like manner must be regulated by the nature and formation of the surface; above all, heavy compact soil, such as is generally met with in the lower lying lands, must be enriched with humus, for which purpose green crops, stable manure and compost are the most suitable materials.

Must Liberian coffee be pruned, and how is it to be done? These are questions often put to me. As far as my own experience goes, I must answer no. At first I was of opinion that such operation was necessary, or at least that the tree should be limited to a single stem; but I am now by no means so sure on that point. I have seen a great number of magnificent trees, growing in two, three and even four stems fully as well as those confined to a single stem. The advantage in allowing a plurality of stems to grow appears in case of any attack on one of them by the "jamur upas"; as the injured stem can be removed easily and the tree remains in good condition.

I need hardly say that every stem or branch attacked by the "jamur upas" and thus cut off should be burnt immediately; although every one must be aware of the necessity of this burning of the diseased parts, it is not sufficiently attended to.

Some of the plants have a disposition to throw out suckers; these must naturally be removed in time.

I cannot recommend the topping of this kind of coffee. The trees are of too vigorous growth; they become too high, so that it is impossible to keep them to a limited height. Should it be attempted to do so, the production of an impenetrable mass of branches would be the consequence, which would interfere with the setting of the fruit and end in injury to the plant. It is true that we have numberless trees here of between 20 and 30 feet high, loaded from top to bottom with fruit, and that ladders are indispensable for gathering the berries. There is no help for this, and it is well worth while to employ them.

How high or how old the tree can become here is not yet known; our oldest plants have reached 15 years, and some have arrived at the height of 25 feet, without showing the smallest sign of age, and go on flourishing and blossoming.

Like every cultured plant the Liberian coffee has its diseases to fight with. I have just mentioned the "jamur upas," besides which the leaf-disease attacks the Liberian coffee. As regards this latter, I need only refer to Dr. Burck's work on the coffee leaf-disease. There are other complaints which coffee here suffers from, but none of a nature to cause any doubt as to the successful future in Java of Liberian coffee under a rational system of cultivation.

And now as to the produce. I regret to say that this is not in keeping with the appearance of the plant. When we look at a tree of 25 feet high, from top to bottom laden with the fine large berries, under the weight of which the branches threaten to give way, we feel inclined to hope for a fabulous quantity of crop. But much of the substance is lost, the pulp and skin are very thick; according to trustworthy data during the East monsoon about 125 gantongs of cherry give 1 pikul of clean coffee, the proportion being 12·5 to 1 in pikuls. In the West monsoon the proportion is more favourable then; from 10·3 gantongs of cherry, 1 is attained of clean coffee, being 10·3 to 1.

Trees of 8 to 9 years old, which yield from 5½ to 8 gantongs of fruit are not unfrequent. But the mean yield of a large plantation is another matter. Besides the data furnished from the Experimental Garden at Tijkeumeuh, I have by the kindness of den Heer P. O. van Motman, obtained data of the produce of a plantation 8 years old with 8 bouws in extent.

The trees were planted in 1882 and gave in 1886, 50 pikuls; in 1887, 96 pikuls; in 1888, 80 pikuls; and in 1889, 88 pikuls. The harvest of 1890 is not all in yet. The harvest is thus respectively 6¼, 12, 10 and 11 pikuls per bouw. The proprietor of this plantation is of opinion that the mean produce of the last three years, viz., 11 pikuls per bouw, would be too much to expect regularly from a large extent of ground.

The price of Liberian coffee is now very good, and the fact is sufficiently established that well-prepared Liberian coffee is fully worth the price of ordinary Java coffee. Two weeks ago a planter shewed me accounts from which it appeared that his Liberian coffee of 1st, 2nd and 3rd sorts had averaged after reduction of all expenses for transport &c. had yielded him at the rate of 60·8 guilders per pikul.

All kinds of difficulties and vexations must be expected in the way of "new products;" the preparation was by no means the least of these difficulties in the case of Liberian coffee. On some plantations, the pulper of Walker & Co. of Colombo is in use, which answers pretty well, although it has its peculiar defects. The chief trouble is caused by the remarkable irregularity in the size of the berries of the Liberian coffee. When the pulper is adjusted to suit the large berries which are the most numerous, all below a certain size pass through unpulped, and have to be separated from the pulp and put through a more closely-set pulper in like manner should the pulper be set so as to suit the smaller-sized berries, the larger do not pass through in both cases, much time and labour are lost.

For the purpose of overcoming this defect, Messrs. Walker & Co., at the instance of Heer P. O. van Motman, have constructed a new pulper, which will soon be in use on Dramaga (Buitenzorg). The principle of this pulper is somewhat more complicated than that first mentioned, but in my opinion very practical. The cherry coffee is first brought by water to the pulper, which is set for the larger berries; the pulp falls into a gutter and is carried away by the steam of water flowing through with it, whilst the larger fruit being freed of its pulp, and the smaller unpulped fall into a sieve. The pulped beans pass through the sieve, whilst those that are not pulped fall over the sieve into a trough and are taken up by an elevator and placed in a more closely set pulper, by which the smallest berry is pulped. The whole machine is worked by water power, and is on a scale sufficiently large to prepare the produce of a large plantation. For the purpose of securing the desired yellow colour, the coffee on the abovenamed plantation is subjected to the following process. After the plucking

the fruit is allowed to lie in moderately deep layers, for two days before being pulped; after pulping the coffee is kept four days in fermenting cisterns; it is then well washed and cleaned, and allowed to dry for a day; it is then heaped up, and allowed to remain four days more, for the so-called "after fermentation," after which it is perfectly dried in the sun.

Over de smaak valt niet te twisten (There is no disputing on matters of taste) has often been said, but I assure you that coffee prepared in the above-described manner, when properly roasted and made, can compete with the finest produce of Moka.

There is something peculiar in the harvest times. They generally happen in two periods: the former lasts from the beginning of December to the half of March, and occurs thus in the driest time of the year in Liberia, the second crop is gathered in the months of July, August and September. According to Buttkofer July is generally a rather dry month, but from the beginning of the latter half of August to the end of September is reckoned the wettest time of the year.

When the separate plants of Liberian coffee in a plantation are carefully examined, a considerable difference can be observed among them, as well in the leaf as in the fruit, and the due selection of plants from which to take seed for propagation is a matter of much importance. It is not sufficient to choose out the largest berries from a great quantity of fruit, but the trees the most suitable should be first selected and the largest berries of these selected trees should be chosen for sowing in the nursery. In this way alone is it possible to improve (veredelen=to ennoble) the Liberian coffee here.

Besides the ordinary varieties, I saw on the planttation Tjomas (Buitenzorg) a coffee plant amongst the Liberian coffee which had much the appearance of a hybrid between the ordinary coffee and the Liberia variety. The plant had some peculiarities of both. In luxuriance it rivalled the strongest Liberian coffee, the leaves though as large as those of the lastnamed possessed a softer texture, and the form of those of Java coffee, but the most remarkable particular is that the pulp had not the coarse and disagreeable taste of the Liberian coffee, but was soft and sweet like that of Java coffee; the size of the berry being the medium size of the Liberian coffee.

At Tjikeumeuh (chikeumeuh) there are some hybrids which are the result of an artificial fructification between Liberia and Menado-coffee.

The young plants of which the mother plant Liberian coffee is fertilized with the pollen (stuifmeel) of Menado coffee, up to the present take after the latter variety, whilst with the contrary (treatment), when the Menado coffee is fertilized with the pollen of the Liberian kind, the resulting plants resemble the Liberian plant. In both cases they resemble at first the male progenitor.

Thus is the Liberian coffee cultivation prosecuted and extended throughout this country with great energy. To my knowledge there is already an extent of over 3,000 bouws of Liberian coffee planted in the subdivision of Buitenzorg, and there are vast tracts of land in the lower lying districts, now waste, that with due cultivation and manuring can be turned into flourishing coffee estates. [*Note by Translator.*—10 katties=1 gantong; 10 gantongs=1 pikul 133⅓lb.]

A MERCHANT of Campinas, S. Paulo, has been fined by the authorities for mixing roasted maize with his ground coffee. And this in the very heart of the S. Paulo coffee district! Some people have no regard for appearances and this merchant should have been hung.—*Rio News.*

COCONUTS.—It is a pity that in Bengal the planting of the coconut is not more largely followed in the Sunderbuns and on the seaboard of Cuttack, where they would probably, under proper cultivation, yield as plentifully as in Ceylon.—*Indian Agriculturist*, Oct. 11th.

CEYLON TEA IN AMERICA!

GOOD NEWS FOR CEYLON PLANTERS.

GUARANTEE GIVEN FOR SALE OF PURE CEYLON TEA ONLY.

The following is an extract from a letter of Messrs. Wattson & Farr to the Hon. W. W. Mitchell, under date New York, 26th September:—"We are now actively at work preparing to push the interests of the new Company and feel quite confident that we shall make it a success and create a large and growing demand for your teas in this country."

We have also received a copy of the prospectus of the new Company with a capital of a million dollars. Besides the names already given as Directors in New York, we have all the Ceylon Directors on as a Board of Management while the following extracts show the object of the Company:—

The object for which this Company is formed is that pure Ceylon tea may be introduced into the United States of America and Canada, or elsewhere, as may be found desirable and that its sale may be widely extended. The present consumption of tea in America amounts to about ninety million pounds per annum, of which about eighty-two millions are from China and Japan, but it is hoped that, if once Ceylon tea get a footing in America, its excellence will create a taste for such tea, and lead to its ultimately taking the place of many of the teas of rival producing countries, in the same way as has been the case in Great Britain. The services of Mr. R. E. Pineo (formerly a planter of long experience in Ceylon) have been secured by the Company, as Manager and Secretary in America, and from his long connection with Ceylon and America, it may be reasonably hoped that the results will justify the selection of Mr. Pineo for this appointment. A Central Tea Emporium has now been in successful operation for nearly a year, at Broadway and 22nd Street, New York City, and a large amount of tea has already been sold and distributed with excellent results. It is intended, as soon as possible, to open further emporiums in all the large cities and to appoints agents throughout the country. The welfare and future prosperity of Ceylon are largely dependent on the success of this enterprise, and the cordial co-operation of all interested in the Island is confidently looked for.

All this shows how entirely honourable and aboveboard has been the action of Messrs. Wattson & Farr, and considering how much they have already done without a cent of remuneration, and considering also the fact that they are to bear the large expense of advertising and other preliminary expenses, out of the shares allotted to them, we think that they in every way deserve well of Ceylon Tea planters. Mr. Grinlinton's personal report will place this in a clear light.

A TIDAL SUPPLY OF ELECTRICITY.—A French engineer, M. Decœur, proposes to supply electric power to Paris. He would generate the required electricity by utilising the tides. For this purpose he intends to construct, near Havre, two large basins joined to each other, into one of which the sea at flood tide flows over a dam, while during ebb it flows out of the other into the sea again. At the inlet and outlet will be erected a number of powerful turbines for transmitting the energy of the water. The mechanical energy produced for transmission to Paris is estimated by M. Decœur at 42,000 horse-power. Perhaps the calculations have not been correctly made, as it costs something to build such works, and the result cannot be much.—*English Mechanic.*

MR. JOHN HUGHES AND ANALYSES OF CEYLON TEA LAND—THE BARREN SOILS OF CEYLON—MR. D. MORRIS AND BOTANICAL STATIONS IN THE WEST INDIES—COCONUT BUTTER.

Meeting Mr. J. Hughes this week he told me that he had received a letter from your Planters' Association asking him to mention the terms upon which he would undertake the analyses, after the system lately discussed in the *Observer*, of 80 or 100 samples of teas. Mr. Hughes said he should answer that letter by this present mail, and we hope, therefore, that his services may soon be made available in a direction in which, as it seems to us here, they may be most beneficially employed.

During the course of conversation, Mr. Hughes remarked to me that he had read with much interest your editorial in the *Tropical Agriculturist* last received here on the barren soils of Ceylon. He told me that with all that was advanced in that article he very fully agreed, and that it was in accordance with experiments made by himself upon samples of Queensland soils which had been sent home to him some years back by the late Mr. Daintree, who was—to the best of my recollection—formerly the Colonial Secretary of Queensland. These samples represented soils upon which virgin forests grew; others which had relapsed from cultivation others which produced scrub only; and some upon which no vegetation at all could be grown. Mr. Hughes did not enter upon full details, but he told me that he found that all the soils which would not produce a tree growth were singularly deficient in potash. He believed, therefore, that the last constituent is a necessity for the cultivation of timber or fruit trees, and that this can never be successful unless potash is either naturally present or is artificially supplied. He remarked further that there was great difficulty in laying down any invariable rules for the fertilization of soils, thus—he mentioned to me an instance lately under his notice in Cornwall where the farmers are in the habit of covering their fields before the cultivation season with six inches of sea-sand—obtaining the best results. Seeing such results follow the practice, farmers in other localities had tried the process, but with most unhappy effect. Inquiring into the cause of difference, Mr. Hughes said that he found the whole of the sea-sand around Bude—where the practice mostly prevailed—to be composed of finely comminuted shells. The dressing was, therefore almost of pure lime. But in the districts where the experiment failed so signally the sea-sand had an altogether different character: It was of comminuted rocks only, and this was hardly likely to possess fertilizing constituents. Mr. Hughes' deduction from this and from other instances in his experience is that no invariable rule can be laid down as to measures likely either to restore lost fertility or to increase that existent. Both soil and fertilizer must be closely examined in every case, and the combination of their several ingredients considered. Nevertheless he believed that the suggestion made in your article as to aerating long disused soils must be ever of good effect, as these, when exposed, would naturally take up from the atmosphere what their condition demanded, and would reject assimilation of those which it did not require.

We see that Mr. D. Morris of Kew is going out shortly to the West Indies to advise the authorities of the Windward and Leeward Islands with respect to botanical stations. He will take out with him several wardian cases containing gambier plants, it being believed that this may prove to be a profitable cultivation.

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My reference to Kew reminds me as to a subject treated of in the latest issue of the *Kew Bulletin*, in which you are sure to feel a great interest. This is the manufacture of butter from coconuts. I lately asked you in these letters if you had heard anything of this new substance, having seen some casual reference to it, but was not prepared to learn, as we have now done from the details published by the kew authorities, how important a manufacture coconut butter is likely to become. Quoting the British Vice-Consul at Berlin, the *Bulletin* inform us that the process of extracting edible fat from coconut "marrow" was discovered about five years ago by a Dr. Schlink, and that it has been worked since 1888 by a firm in Mannheim. The appreciation of this butter has so extended that factories of it are now in course of erection in Pau and at Amsterdam. The Vice-Consul tells us that the substance has already an almost unlimited sale, the trade being chiefly with Germany and Switzerland. He declares it to be gradually but quickly ousting from public favour oleo-margarine and all other butter preparation from animal fats. The present factory, he further tells us, can only supply about 50 cwt. daily, while the demand is frequently up to twice that amount. The *Bulletin* informs us further that the price at which this butter is sold is from 6½d to 7½d per lb. the nuts being procured from the South Sea Islands and the African and South American coasts. The butter product consists of 60 to 70 per cent of fat and 23 to 25 per cent of organic matter, of which matter 9 to 10 per cent is albumen. The product is of a clear white colour and hardens at 66 degrees Fahr. It is said to be very suitable for cooking purposes and has no disagreeable taste or smell. Altogether we seem justified in the expectation that coconut butter will ere long becomel a large article of consumption in every househod. No housewife, however much she may justly turn up her nose at oleo-margarine and doubt its origin of manufacture, would do so at the outcome of th e pure coconut; and as we can't buy cooking butter under 1s 2d to 1s 4d per lb. here, the alternative vould be sure to be welcomed, and you in Ceylon should be on the look-out for sharing in the supply of its "raw material," the demand for which will probably increase highly. I can't say, the cooking with coconut oil, however freshly this may have been expressed, was ever quite to my palate. Probably the offending cause, whatever it may be, is removed under this new process.—London *Cor.*

THE CEYLON AMERICAN TEA CO., LD.

The following is an extract from a London letter to the local agents:—

"The new Tea Co. seems to be making encouraging progress, and I think Wattson & Farr will be successful in getting all the agents they require; if so I consider that success is secured. Grinlinton will tell you all about the meeting of the Tea Committee of the Ceylon Association here. Mr. Davidson, who came from America primed with the accusations and charges made by an anonymous individual in New York, laid all these before the Tea Committee last week. On Mr. Grinlinton's being informed of it he expressed a wish to meet him before the Committee, and this was arranged for the 15th ins't Mr. Davidson was shut up practically by Grinlintons. first answer, and opened not his mouth again· Grinlinton's statement was well received."

From the *New York Journal of Commerce*, we quote as follows:—

"The Ceylon Planters' Tea Company has been incorporated with a capital of $1,000,000 to take over the

business of the Ceylon Planters' American Tea Company, Limited, of Ceylon. Agents are appointed to carry on the business of the company, each of whom is financially interested in the welfare and success of the company. This is in accordance with the scheme favoured by Ex-Mayor Howitt at the meeting of the Iron and Steel Institute. He said: 'It should be a matter of congratulation that the formation of trades unions contemporaneously with the rapid growth of large corporations whose stock is divided into such small shares as to admit of easy distribution clears the way for the new era when every self-respecting workman will insist upon being an owner, and every well-managed corporation will see that its workmen are directly interested in the result of the business. To effect this desirable end no compulsory legislation and no additions to the powers of corporations are needed."

And the advertisement displayed on a big scale in the paper is as follows:—

"The Ceylon Planters' Tea Company, trading under the auspices of the Planters' Association of Ceylon, want representatives everywhere on the co-operative plan. Responsibility and good standing required. Address: 4 East 22nd Street, New York."

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Oct. 9th.

CINCHONA.—The supply offered at Tuesday's auctions was somewhat in excess of the average of recent sales. It consisted of:—

	Packages		Packages	
Ceylon bark	1,561	of which	1,458	were sold
East Indian bark	403	do	385	do
Java bark	62	do	62	do
S. American bark	970	do	503	do
W. C. African bark	1	do	1	do
Total	2,997	do	2,409	do

It was believed in some quarters that the sales, in sympathy with those held in Amsterdam last week, would exhibit a dull tone with an easier tendency, but such was by no means the case. From the outset the competition was strong, and as the sales proceeded the demand improved, and the equivalent of the preceding sale's rates was willingly paid. The unit is generally placed at $1\frac{3}{4}$d to $1\frac{7}{8}$d per lb, a few parcels even reacting the twopenny unit. There was a very considerable supply of Succirubra bark from Ceylon, and a few lots of fine renewed chips and shavings realised extreme values. Ledger barks were poorly represented; but there was a very good show of Officinalis chips from India and Ceylon. Cultivated South American Calisaya, too, was unusually well represented, over 25 tons of it being sold at steady rates. Altogether the extraordinary proportion of 92 per cent of the supply offered was sold.

ESSENTIAL OILS.—For Citronella $\frac{7}{8}$d per oz. is required but perhaps $\frac{3}{4}$d would not be refused.

LONDON, Oct. 16th.

ARECA NUTS remain very scarce and dear. Ten bags of good sound seeds were shown today, and bought in at 45s per cwt. The owner, we believe, would take 39s per cwt.

COCA LEAVES.—The recently reported arrival of 110 packages "cocoa leaves" appears to have been entered in mistake at the Customs, and does not seem to exist. At today's auctions, 20 cases Java coca leaves, which have been offered several times previously, were bought in at 6d per lb. nominally. An offer of $1\frac{1}{2}$d per lb. was made for the whole parcel, which consisted of ordinary dark crushed leaves, but it could not be accepted. For 3 bales South American leaves, fair but rather broken palish green, good flavour, the prico is 1s 1d to 1s 2d per lb.

CROTON SEEDS.—Of a parcel of 30 bags from Colombo, advertised for sale, no samples were shown.

ESSENTIAL OILS.—Citronella oil quiet, but steady. We call the nearest spot quotation $\frac{7}{8}$d per oz. while for arrival, fair native oil offers at $11\frac{3}{4}$d per lb. c.i.f. terms. A sale of 100 cases Lemongrass oil is reported at $1\frac{1}{2}$d c.i.f. per oz for arrival, the nearest spot price being $1\frac{7}{8}$d per oz at which tho article is very firm.

QUININE.—The shilling limit has again been touched this week, 20,000 oz. second-hand German bulk having changed hands at that limit, but since thon $12\frac{1}{4}$d and $12\frac{1}{2}$d has been paid on tho spot, and tho market closes steadier, with buyers at the latter figuro. A sale of 10,000 oz. January-March at $12\frac{3}{4}$d to 13d (second hand) is also reported.

MEETING OF THE SUB-COMMITTEE OF THE C. T. ASSOCIATION.

MESSRS. GRINLINTON AND ROGIVUE GIVE ACCOUNTS OF THEIR MISSIONS.

(*From Our London Correspondent.*)

LONDON, Oct. 17th.

On Wednesday last a meeting of the members of the Sub Committee on tea, and others, was held at the rooms of the Ceylon Association in London to consider further steps in regard to the weighing of tea, and to hear reports by Messrs. Grinlinton and Rogivue on their respective missions to the United States and Russia. The following were present:—Mr. J. L. Shand in the chair, and Messrs. H. K. Rutherford, C. Shand, A. Brooke, T. Dickson, J. Stretch, T. Gray, L. Davidson, A. S. Pagden, C. C. S., J. Anderson, A. Ross, J. J. Grinlinton, C. Rogivue, Esdaile, representatives of Messrs. Geo. White & Co., Messrs. Gow, Wilson and Stanton, Messrs. J. and H. Thompson & Co., Mr. J. Capper.

The Chairman reminded the members of the Tea Committee of the appointment of a Sub-Committee to confer with the members of the Indian Tea Association in reference to the recent Customs Order as to the weighing of tea, and its suspension. After conferring together, members had arrived at the conclusion that it would be more advisable to address themselves on this subject to the Lords of the Treasury than to the Customs authorities, and if this were approved by the General Committee the course would be adopted. A resolution to this effect having been carried, the Chairman said that they would now pass to the next subject before them, the pushing of Ceylon Tea in America; and, as Mr. Grinlinton was present, they would be happy to listen to what he had to tell them in regard to his proceedings whilst in the United States as the representative of the Ceylon American Tea Company.

Mr. Grinlinton then addressed the meeting on the subject of his mission to America, in terms and in substance pretty much as I have related in my previous letter. He reminded them that be had gone thither in the first place on private affairs connected with his family, and took the opportunity, whilst there, of arranging for the final settlement of the negotiations between the Ceylon American Tea Company and Messrs. Watson and Farr of New York. He was happy in being able to assure those present that his efforts to place matters between the parties on a satisfactory footing had been completely successful, and he had not the slightest doubt that the arrangement would be cordially approved by friends in Ceylon. He might mention that, before he left New York, orders for Tea had been sent by the Company, whose prospectus he laid on the table, to the Colombo Agents for an amount of £3,000, accompanied by bills for the amount, and he had since learnt that a further remittance and order had been made to the extent of £2,500, so that a substantial commencement had been made. Letters he had recently received from the Company informed him of most gratifying development of their business. In conclusion, he said he should be happy to reply to any question that might be put to him regarding this matter by those present.

Mr. Davidson, of Gikiyanakanda, who has also recently returned from the United States, enquired whether it was not a fact that, although the Company was established in New York and had its place of business there, it had nevertheless been registered in the State of New Jersey? What was the reason for this arrangement?

The reply was that the fees for registration were much lower in New Jersey than in New York, and the yearly fee payable by trading companies was also much more moderate in the former Stato.

In reply to a further question by Mr. Davidson, as to the Company having gone to allotment and as to the amount of capital paid up, Mr. Grinlinton said that, of course, allotment had taken place, but he had no certain information as to the capital paid up. He believed the whole had been guaranteed much in the same manner as capital is underwritten in this country by promoters.

Mr. Thos. Dickson suggested that as a matter of fact the American Company was at present no more than a Syndicate, as we term it in England, and that the actual Company was now being floated by that body. Mr. Grinlinton remarked that Syndicates according to the English methods were not known in America; but he fancied the first installation of the body was in reality of that nature. The extra shares to be given to the Company's Agents on their subscribing and paying for others came from the promoters' 20,000 shares, for which they had stipulated. Of course, if the shares of the Company were not eventually subscribed for, it could not be floated, and all expenses for advertising, &c., which would be considerable, would be borne by Messrs. Wattson & Farr.

A desultory conversation followed a vote of thanks to Mr. Grinlinton, during which a remark was made not at all complimentary to Mr. Pineo, upon which Mr. Grinlinton took up his defence, declaring that the gentleman in question had done everything in his power to forward the interests of Ceylon Tea, and that he deserved well of Ceylon planters.

Mons. Rogivue having been requested to state his work and views in connection with Ceylon Tea in Russia handed to the Chairman a written Report, a copy of which will, no doubt, be sent to Ceylon by this mail. He said that he had been favored by his London Agents, Messrs. Malcolm, Kearton & Co., and others, with excellent introductions and had everywhere been received with much consideration, but he had not had the advantages possessed by Mr. Grinlinton of addressing himself to dealers speaking his own language, and he (Mr. R.) had also to encounter far stronger prejudices than are met with in America. He had interviewed many of the best wholesale firms in Moscow, St. Petersburgh, and Nijni, but one and all declared there was no demand for Ceylon Tea, and that what was now imported was obliged to be disposed of by blending. But when he came to interview retailers and consumers, he was told quite a different story—that the tea was excellent and moderate in price—and a number of persons had requested him to sell them quantities of 20 and 30 lb. for trial. It was evident that time would be required to bring it before the consuming public, and therefore money. He should consult with the Committee, after they had read and considered his report, and it would be then needful to determine what course should be pursued in the future. In Russia, as in this country, complaints as to the falling-off in the quality of China were loud and general, and he believed the present time was favourable for pushing the teas of Ceylon in that country. He had tasted the tea prepared by the Russian people and it was so utterly flavorless that he could not understand how they could be induced to drink it: while the leaves, poor as they were, had to stand four or five successive waters!

From the above statements it is evident that in Russia, as in America, it is the wholesale trade who oppose the introduction and sale of your teas on their own merits, as they can make for more money by blending than by selling them pure as they reach them.

Mr. Grinlinton left London this day for Brussels, proceeding *via* Metz, Venice, Florence and Rome to embark at Naples on the 25th on the P. & O. steamer "Khedive."—Local "Times." J. C.

INDIA TEA NOTES.

DEHRA DUN, Oct. 14th.—We are still making tea, but the flushes are stunted owing to the cold nights.

SELENG, Oct. 12th.—So far lots of leaf about, and the little rain just fallen may help us on to end of month. Cold weather is setting in fast.

NORTH LAKIMPORE, Oct. 6th.—The end of Sept. was very dry and hot; rain has, however, come at last—1·20 having fallen during the last three days; from the look of the sky, we may expect more, and which should give us a good start for Oct. Mosquito still out all over the district. Rainfall to date 144 18.

DOOARS, DAM DIM, Oct. 17th.—This season came in with a ruinously hot dry spring, but is finishing up with a miserably cold, wet Autumn. For the past four days and nights, it has rained incessantly, and the weather has been so cold that coolies could do little for no work.—*Indian Planters' Gazette*, Oct. 21st.

A NEW KIND OF "TEA."

We recently noticed the industry which has lately sprung up in Germany of manufacturing the leaves of the strawberry into a substitute for tea, but the people of Kent are going in for hops as a substitute. They are of opinion that as hops make such capital beer the plant will make equally excellent tea, and they are hard at work elaborating a process for converting hops into fresh tea leaves. The object of this, they state, is not merely to get a new tea, but to furnish an article which will alter both the flavour and the quality of the teas now in use. The fresh infusion obtained from the dried flowers of the hop, in which formentation plays no part, is an excellent drink quite free from alcohol. This beverage contains all the tonic, soothing and nutritive properties of the hop without any objectionable admixture; but the flavour would not be acceptable to the palates of the unsophisticated. However they may be led to appreciate it gradually in the same way as beer or stout. The taste of the infusion could also easily he modified by the addition of sugar and cream. The hop growers of Kent also intend to use hops as a qualifier and improver of the common Indian and Chinese teas. Works have been started at Maidstone for drying and rolling the leaves so as to reduce them to the appearance of ordinary teas which are to be mixed with them. The leaves are also to be powdered and mixed with coffee or cocoa.—*Madras Mail*, Oct. 25th.

CACAO STEALING ON ASGIRIA ESTATE.

IN THE POLICE COURT OF MATALE.

No. 5,603. F. G. Jokim of the Asgiria estate, complainant, *vs.* Sangen of Asgiria estate, defendant.

In this case the accused who was employed as a night watcher on the Asgiria estate was charged with stealing a quantity of cacao pods by the complainant, who is the day watcher.

It transpired in evidence that when complainant went to relieve the accused early in the morning of the 26th instant he missed him, but soon after heard a noise in the cacao field saying "Don't fear, no one will come here." Complainant went in that direction with another man and seized the accused in the act of stealing cacao pods, when two others whom he was unable to identify ran away from the cacao bushes. Complainant reported the facts to Mr. Booth, the superintendent, who directed the prosecution. The evidence called for the prosecution fully supported the charge, and the accused was found guilty and sentenced to six months' rigorous imprisonment.

This same accused was a short time ago charged with causing hurt to a watchman who was ordered to watch in his stead by Rengasami kanakapulle on a certain night as the accused had failed to attend to his duty. In defence he urged that the substitute was stealing coffee for the kanakapulle and that he struck him as the former threatened to injure him. The Magistrate then considered him to be an injured innocent and let him off with a nominal fine. It is now evident that he calculated too much on the favorable impression he had made on the Magistrate in the former case.

A HOBBY FOR COUNTRY SCHOOLMASTERS.—On Saturday afternoon, 27th ult., Mr. T. W. Ogilvie, Demonstrator of Natural History, Aberdeen University, delivered a lecture to the members of the Aberdeen branch of the Eudcational Institute of Scotland, on "The Fertilisation of Plants." Mr. Ogilvie, in opening his lecture, said, country teachers had an excellent opportunity of working out the flora and fauna of their respective districts, but he had observed with regret the extreme infrequency with which those opportunities were embraced, and he had chosen the subject of his lecture in the hope that he might induce some to take up such an interesting study as an antidote to the *ennui* with which country teachers who and not a hobby, must be afflicted.—*Gardeners' Chronicle.*

TEA-PLANTING IN NATAL.

The *Witness* has interviewed Mr. L. H. Neall, formerly manager of the Jorehaut Tea Company cf Assam. Mr. Neall said he had come to Natal with a view to promote a company for tea cultivation on the coast. He has paid a visit to all suitable lands along the coast, from the Lower Tugela to the Lower Umzimkulu. With regard to the latter district, Mr. Neall says it is eminently adapted for tea plantations, and the lands are rich in every property necessary for healthy and vigorous development of the plant. Tea-planting can be made in some cases much more successful in Natal than in India. The plants here enjoy absolute immunity from several diseases common to them elsewhere. Recent failures he ascribes to insufficient capital and want of knowledge of after-treatment and various processes of manufacture. He condemns the class of coolies at present imported, and is certain that the conduct of labour negotiations through proper sources in Calcutta, would procure efficient tea workers; £20,000 in £1 shares is the capital deemed necessary for the proper starting of a company and the initial expenditure for a year's rent of 2,000 acres, survey, buildings, stock plant, tea seed, &c., is estimated at over £1,200. Mr. Neall expresses the conviction that there is a greater opening for tea industry in this colony than many imagine, and that it only requires experienced men and careful management to render in the most paying of all colonial undertakings.—*Natal Mercury*, Sept. 17th.

PLANTING IN THE INTERIOR OF MADAGASCAR.

The following is from a contribution to the *Madagascar News* describing the interior of the island:—

Leaving Andrangoloaka and climbing on up the hill the forest is entered. Away down in the depths of the forest are some fine trees. For three hours Mr. Jukes was journeying through the forest, then the mountains abruptly terminate and a sudden descent is made into the beautiful and fertile valley of Lohasaha. On each side of the valley rise lofty mountains over whose slopes are spread waves of verdure indescribable of tint and inconceivable in grandeur. In the valley very fine tobacco is grown, and, it is said, His Excellency the Prime Minister has a tea-plantation there. The soil is most suitable for agricultural purposes, being a rich alluvial deposit, but the valley shut in by mountains on three sides is a *cul de sac*, and, consequently "as the summer breezes cannot waft readily through, is extremely unhealthy, so much so that it is only with the utmost difficulty that the natives of Antananarivo can be induced to go down there during the fever season. The valley is very extensive and contains a great number of small hamlets, consisting of about five houses each. The tribe inhabiting the valley is the Bezanozano. This race is becoming crushed in spirit and slothful under the weight of an oppressive *fanompoana* (forced service). So broken down are they under that hurtful and hateful system that they are unable to profit by the bountifulness of the soil upon which they dwell. Knowing that whatever crop they might produce would be pounced upon by some harpy of an official, the Bezanozano make no effort and pass their lives in squalonr and want, living in the merest hovels. Undoubtedly! 'the time has come and the hour has struck for civilization to enter' Madagascar, and 'to create roads into the fastnesses of cruelty and ignorance.' There are five churches and schools in the valley in charge of native evangelists and teachers who are mostly Hova. How is it that these Hova evangelists and teachers do not raise their collective voice against the oppression of officials who, despite their fervent Sunday professions and impassioned weekday prayer, are every whit as bad and intolerable as "the Arab kidnapper and man destroyer" of Africa. Is it because that sonorous and solemn 1885 Notification to the Provincial Governors was issued for the perusal of the Christian Powers rather than for that of the Provincial officials? Otherwise how is it that "people who are guilty of nothing are threatened and ruined" and the Queen's kingdom is not preserved but damaged by her provincial officials monstrously abusing the power with which they have unfortunately been entrusted, or permitted to usurp *unchecked*?

NORTH BORNEO NOTES:—GENERAL.

His Excellency the Governor accompanied by Mrs. Creagh and family left Sandakan for Labuan in the British North Borneo Cruiser "Petrel" on Saturday September 6th last. The Serang of the steam launch "Kimanis" was in charge of the "Petrel."

Captain R. D. Beeston visited the Suanlamba Estate on September 6th, in company with Mr. A. E. Turner of Messrs. Mansfield Bogaardt and Company, and transferred the Chinese and Javanese Coolies to different estates to work out their contracts. The whole of the coolies were perfectly willing to sign their agreements and acknowledged their debts accruing from advances they had to work off. Most of the coolies have been transferred to the Batu Puteh Estate on the Kinabatangan of which Mr. Breigtag is Manager.

On Saturday September 13th, Captain Beeston visited the Segaliud Estate, managed by Mr. T. Johnston. Mr. H. St. J. Hughes as agent for the Company having asked Captain Beeston to accompany him. The estate proved well worthy of inspection the tobacco being of capital quality and likely to go some seven piculs per field. Cutting had commenced some few days before and at the date of the visit some 150,000 plants seen were hanging in the drying sheds. The tobacco plants had been cut and were very high averaging some six feet each, and in the fields it was difficult to see the coolies cutting, so high was the tobacco. A capital crop is expected from this estate as also from Mr. Kalfsterman's which is close by and is aids to contain an equally good crop.

We are sorry to have to chronicle an accident that might have had serious results, which befell Baron de Lissa on Monday evening September 8th last. On that day a heavy thunderstorm swept over Sandakan, the rain coming down in torrents, and rushing down the main street like a water course. Baron de Lissa had mounted his horse and was leaving the Court House entrance. His horse placed his fore foot on the plank of a culvert, which was rotten. The horse fell and rolled over, his rider receiving a severe strain. We regret to say that the Baron has had a very painful time of it, but thanks to the care of Doctor Walker he is now recovered.

We are happy to say that all reports from the various tobacco estates on the East Coast, namely in Darvel Bay, the Kinabatangan river, Sandakan Bay, the Sugut and Labuk rivers show a state of affairs at once most promising and flourishing. The present year so far seems determined to make amends for the unusual and phenomenal year of rain and floods of 1889. On all sides we have news of good crops of first-class tobacco. We trust to see the best of results for the planting interest when the prices of the 1890 crop are known.—*North Borneo Herald*, Oct. 1st.

"THE AMERICAN GIRL'S latest restorative (says the *L. & C. Express*) is quinine. She carries it in the form of pills in an ornamental cut-glass bottle with a gold stopper. It has quite superseded morphia and strychnine lozenges. If she is tired she takes two pills; if in a draught, one; if hungry, four or five; and if her feet get wet, ten are the correct number. Each pill contains two grains. Six are a cure for indigestion. The quinine bottle is produced on all occasions and in all sorts of place" There is great exageration here: 20 grains of quinine constitute a truly heroic does.

PROSPECTS OF THE TEA INDUSTRY.

There has been a good deal of correspondence on the depressed state of the Calcutta tea market, and the impending crisis so likely to cripple the tea industry seriously. Some correspondents advocato combination amongst proprietors, &c., or suggest somo artificial "propping up" of tho market during the present uncertain period. But though these vague hints aro thrown out, no real plan likely to moet with success has boen promulgated. The Calcutta market reflects the English market pretty truly, allowing for commissions, and the profits which tho middle-man *i.e.*, the Calcutta buyer, comes out here for tho purpose of making. I cannot see that the local market is affecting the price of our produco this season more than it has done in any previous year. Wo are suffering from the rise in exchange, and that only; and so, as to carry on our business we spend the majority of our rupees in this country, where they havo the same purchasing power as before the alteration in exchange, we are in a way double sufferers by the inflation of silver.

Prices in London aro entirely governed by supply and demand, and "cornering," or artificial interfereneo with supplies, will and can only have the temporary effect it has had in the caso of so many other products, with a probable eventual collapse, putting producers in a far worse position than they are in at present.

As far as planters are concorned, they can only do as your correspondent "Spectator" suggested; reduce the price of production; that locally is now cut down as low as it safely can be, with the exception of freight charges, which possibly though improbably, tho Associations, by representation, might induce the United Steam Companies to lower. This is hardly the place to discuss the rival merits of high and low cultivations, but retrogression in these days seldom pays and high cultivation carefully adopted and superintended doubtless repays itself many times over. Tho cost of labour is a question on which there can be no two opinions, and the remedy lies with the proprietor, shareholders, and agents, more than with the planter. Agents' charges would also bear careful scrutiny at a time when all others interested in tho entorprise are sufferers. But all these remedies and suggestions amount to littlo as long as prices romain at tho present rate.

Combination amongst owners, shareholders, and debenture-holders, I could secure the abolition of the Calcutta weekly auctions. What a saving that in itself would be—the buying and selling commissions, brokerage, &c.! And it would obtain for the producer the profit the Calcutta buyer does—must, secure. Did he not—and he invariably states it is a losing game—how could he afford to oome to India annually, live at the bost hotels, enjoy himself, return to England at the end of the season? On the face of it, this profit would go into the proprietor's pocket.

Should the local demand for India be sufficient and the financial condition of certain concerns necossitate quick realisation of proceeds, a monthly Calcutta sale would quite satisfactorily supply the requirement.

Again, overproduction, or rather, say, too rapid increase in production, has been the chief cause of the low prices prevalent the last few years. If those financially interested would combine for one year, and agree not to open out any new extensions during season 1891, but create a strong Syndicate and spend, say, 50 per cent. of what they would have spent in extending the area of the plant, to its own dotriment, in opening out new markets in the Australian and Capo Colonies, Canada, and the Unitod States of America, hitherto practically undeveloped—I believe the real solution of the present difficulty is found.

By push resolution, and the purity and superiority of our produoe, we havo outstod China toa from its first place in the London market. With capital, the samo resolution, and continued superiority of our article, without too rapid production, we can, and will have, to do the same elsewhere.—H. in the *Englishman*.

THE CEYLON PLANTERS' AMERICAN TEA COMPONY LTD.

REPORT OF THE DIRECTORS WITH STATEMENT OF ACCOUNTS FOR HALF-YEAR ENDING 30TH JUNE, 1890.

The Statement of Accounts to June 30th, 1890, shews a debit balance of R29,096·95.

The profit on Salos has amounted R2,521·34, but the heavy initial expenditure, together with the cost of pushing the business in America, have absorbed a large amount of tho limited capital of the Company.

In May, proposals were made by Messrs. Wattson and Farr, New York, for the taking over by a new Company there of the business of the Company formed in Ceylon, undor which, each Shareholdor in the latter would receive for each of his paid-up shares, two shares in tho new Company.

An Extraordinary General Meeting of Shareholders was held on July 11th, at which the torms were accepted, and tho Hon'ble J. J. Grinlinton, who proceeded to New York with powers to ratify the arrangement, has telegraphed that it has been given effect to, and that the necessary documents have been signed.

The limited number of shares taken in tho local Company rendered it improbable that its operations could have been carried on very much longer, and it is hoped that the ample amount of capital necessary, and which will be provided under the new scheme that has been inaugurated, will ensure the carrying out effectually of the objects for the Ceylon Planters' American Tea Company was formed.

By Order of the Board of Directors,

For the Ceylon Planters' American Tea Co., Ltd.,
DARLEY, BUTLER & Co.,
Agents and Secretaries.

Colombo, 22nd October 1890.

CAPITAL AND LIABILITIES.

	R	c.
Capital :—	57,850	00
Total amount received as under :—		
persons — shares		
7 holding 27 paid R45 per share	1,215	00
299 " 1,503 paid R35 " "	52,605	00
31 " 140 paid R25 " "	3,500	00
10 " 23 paid R15 " "	345	00
9 " 37 paid R 5 " "	185	00
356 " 1,730 shares.		
Particulars of Arrears will be found annexed.		
Debts and Liabilities :—	9,581	20
Amount deposited by Shareholdes in anticipation of Calls	210	00
Amount due to Wattson & Farr, New York Agents	9,371	20
	R67,431	20

PROPERTY AND ASSETS.

	R	c.
Property held by the Company :—	16,707	43
Movable Property :—		
Furniture and Fixtures at New York ...	3,136	23
Stock-in-Trade :—		
Tea at New York Stores, lb. 21,700... ...	11,082	80
Coffee " " " 1,345... ...	917	17
Curios " " "	1,571	23
	12,220	84
Debts owing to the Company :—		
By Amount advanced on a consignment to New York	269	59
" R. E. Pineo	207	78
" Divers Debtors		
Amount considered good at New York ...	11,743	47
	9,405	98
Cash :—		
At the Chartered Mercantile Bank of India, London and China	9,400	86
In hand	5	12
Profit and Loss :—		
Balance of this account	29,096	95
	R67,431	20

E. & O. E.

The above Balance Sheet, to the best of our belief, contains a true account of the Capital and Liabilities, and of the Property and Assets of the Company.
S. T. RICHMOND, DARLEY, BUTLER & Co.,
Auditor. Agents and Secretaries
Colombo, 22nd October, 1890.
T. North Christie, H. Whitham, C. S. Armstrong, W. W. Mitchell, V. A. Julius.—Directors.

THE CEYLON PLANTERS' AMERICAN TEA COMPANY, LIMITED.

Statement of Profit and Loss made up to 30th June, 1890.

Dr.

	R.	c.
To Rent of Premises at New York	5,886	00
Salaries:—Assistants do	1,090	00
Native Servants do	1,984	64
Manager do	3,010	88
Managing Director and the Agents and Secretaries	2,291	67
	8,377	19
Director' Fees	1,800	00
Advertiscment Charges at New York ...	3,099	47
Printing and Stationary do and Colombo ...	1,769	44
Stamps and Telegrams do and Colombo ...	427	87
Charges (including passage money and travelling expenses, Hotel bills, &c, Mr. Pinco and native servants)	5,757	47
Preliminary expenses	936	37
A. Philip (for his services)	861	64
Miscellaucous payments at New York	2,488	16
Exchange	212	92
Total...	31,636	53

Cr.

	R.	c.
By transfer fees	10	00
Interest	8	24
Profit on Tea sold	2,469	29
,, on Coffee sold	52	05
Balance	29,096	95
Total...	31,636	53

E. & O. E. Colombo, 22nd October, 1890.

Examined and found correct. S. T. RICHMOND, Auditor. DARLEY, BUTLER & Co., Agents & Secretaries. Directors:—T. North Christie, H. Whitham, C. S. Armstrong, W. W. Mitchell and V. A. Julius.

HIGH PRICES FOR CEYLON AND INDIAN TEAS.

"Peripatetic Planter" writing to the *Indian Planters' Gazette* refers to the sale of the Hethersett golden tips at 30s 6d as follows:—

Query, how many hundred pounds of decent Broken Orange Pekoe were reduced in appearance several pence per lb. by the abstraction of these 15 lb of their "glory?" Hethersett is a garden of 232 acres under Tea, near Kandapola, in Ceylon, managed by Mr. H. Macandrew, for Mr. J. Macandrew, the Agents being Messrs. Whittall & Co., Colombo. This price is the highest by far, which has been known in recent years, and personally I have no recollection of its ever having been approached by any British Grown Tea. Of course such Tea can only be made at a very great sacrifice; and is probably really only beneficial as an advertisement to get an estate's name talked about and known; which is no small advantage; especially when original estate-packed packets are on sale in England, as in the case of many Ceylon estates now-a-days.

The next feature for comment is the extraordinary invoice from the Panitola Estate of the Jokai (Assam) Tea Company, Limited, items from which invoice appear above. Four lines above 2s per lb is good enough in these times; but to be able to decline a bid of 2s 7½d is an additional feature in Mr. Madden's cap—and to realize 1s 4d per lb for his Pekoe Souchong! when some are getting 8¼d to 10d a lb for their Broken Pekoe and even Broken Orange Pekoe, after such prices too, for his better qualities which prove that he is not "under marking," is phenomenal, simply. The Chairman of the Company told me with glee yesterday, that he had not seen such an array of prices for five years! It is worth adding, in accordance with what I said last week, that Panitola has Blackman Fans; not that I wish to imply for one moment, that these prices are due to that fact—but this much is safe to infer, they *haven't injured* Mr. Madden's splendid Tea. This invoice, unlike the Hethersett bid for "glory," is *Business* with *Honour*, to paraphrase B. D. Earl of B. As regards the market of the week, the above prices are all the more remarkable, in that the market has shown a down grade tendency in some respects, and is decidedly weaker in the case of ordinary and inferior Pekoe Souchongs, which have declined ¼d to ½d per lb and sell from 7¼d to 8½d. There was a decent ordinary demand, which would have done justice to more limited offerings, but the market was flooded, and there was also an excessive number of Breaks which rather exceeded the physical powers of the Brokers to sample properly thereby leading to irregularity in prices.—*Indian Planters' Gazette*, Oct. 21st.

PLANTING SCIENTIFIC NOTES.

The urns of all these plants enclose, before the opening of the operculum or cover, a limpid liquid slightly acid. When the operculum opens the liquid seems to putrefy, and the vestiges of insects are found in it. M. Dubois found that if the liquid was drawn from the still closed urn by means of a sterilised pipette, it continued limpid for several months and when first drawn had no effect on coagulated albumen, even if heated to a temperature of 35deg. or 40deg. C. When filtered at the end of several hours it contained no peptones. Nor were any micro-organisms found in the pure liquid of the closed urns, or any trace of putrefaction. Only a *Torula*, similar to the yeast of beer, was noticed at times, but its presence and purpose there has not yet been fully examined.

On the other hand, when the liquid was drawn from urns which had been open some little time, and was still clear, it rapidly attacked the albumen (little tubes of white of egg) which became transparent and gelatinous, and lost its angles. In some cases the liquid became putrefied. It was found to swarm with diverse micro-organisms, and after filtration gave some of the reactions of the peptones. Many of the open urns contained insects, but in process of putrefaction, not of digestion. Fresh fibrine was not used in these experiments because it dissolves in certain liquids without there being a true digestion, and because it would have been cooked during the sterilisation. Nor was cartilage used, because it would have been partially transformed into gelatine.

M. Dubois concludes from his researches that the liquid of the *Nepenthes* does not contain a digestive ingredient like pepsine, and that they are not carnivorous plants. The phenomenom of false digestion observed by Hooker was, without doubt, caused by micro-organisms which had entered the urn from without, and were not secreted by the plant.

Vegetation appears to be retreating on the high Alps. Mr. David Martin, a geological surveyor, has observed that the rhododendron is not found above a height of 2,000 metres, whereas 20 years ago it flourished at 2,350 metres. Birch, pines, &c., disappear at an altitude of 1,800 metres, except in certain parts exposed to the moist winds of the north, where they reach 2,300 metres. Lower down, the vine, which formerly grew at Valgourdemar, an altitude of 1,050 metres, is only seen to-day at a height of 850 metres. Poplars are nearly all dead upon the crest of the hills.

This retrogression of vegetation has also been observed in Siberia, and, among other places in Savoy and at the Grande Chartreuse. Mr. Martin thinks that owing to the disappearance of glaciers the trees suffer from drought in summer, and extreme cold in winter, against which they are not sufficiently protected by the snow.

The new explosive "carbonite" is giving satisfaction to coal miners. At a recent meeting of the South Wales Institute of Engineers, Mr. W. Stewart

stated that within his experience a ton of the material had been used without a sign of flame or sparking. It is a stable compound, and can be stored without deterioration for any length of time. It is rendered comparatively safe by the fact that a detonator is required to explode it. If struck with a hammer or stone no danger need to be apprehended.

Cardonite is lighter than dynamite, is of a brownish colour, and contains 28 per cent. of nitroglycerine. Certain sulphuretted hydrocarbons are added to moderate the susceptibility of the nitroglycerine.

Some years ago the late Sir William Siemens obtained some interesting results by growing vegetables and fruit under the continued influence of the electric light. In the botanic department at Cornell University some further experiments have been made in the same direction. The rays of powerful electric lamps were allowed to fall on the plants day and night, and the seedlings fairly shot up. In a few weeks they were several times taller than others growing in the natural way. So far as foliage went there seemed a decided advantage in the luminous forcing but in the matter of fruit, the plants which had grown as usual were more prolific than those which had been forced.

PROSPECTS OF CINCHONA.

It will be remembered that some time ago an Amsterdam cinchona broker alleged in our columns that the cause of the depression in the price of quinine was the action of some of the manufacturers who had made contracts with the Java planters direct to buy their bark upon the basis of the cinchona unit upon its arrival. This same broker now returns to the charge in the *Indian Mercury*, with special reference to the last bark sales in Amsterdam. The sales of October 2nd he says, were exceedingly disappointing. Some of the large buyers only brought very moderately, and the Brunswick works took practically nothing at all. He alleges that the decline thus caused was due directly to the action of some of these buyers. Shortly before the auctions, he writes, the quinine market was firm although quiet, but on October 1st the Brunswick works suddenly offered quinine at a considerable decline. The steamer which recently arrived in Holand from Java, and others now on the way have brought considerable quantities of bark, all consigned directly to the works by the planters. The planters will be paid for that bark upon the basis of the cinchona unit prevailing when it arrives at the works; consequently the buyers have a direct interest in depressing the quinine market, apart from the fact that they may simultaneously use the occasion to buy cheaply in the market in order to fill previous contracts made by them. Until this state of affairs is altered, the broker declares, it will be impossible to look for any improvement in quinine or in cinchona.—*Chemist and Druggist*, Oct. 16th.

THE AMSTERDAM CINCHONA AUCTIONS.

AMSTERDAM, Oct. 22nd.

CINCHONA.—The sales in Amsterdam on Nov. 6th, will consist of 4,699 bales and 450 cases, or about 392 tons, viz. :—Java bark from Government plant, 418 bales 47 cases, about 39·5 tons; from private plant, 4,281 bales 403 cases, about 352·5 tons; British Indian bark, 45 bales, about 3·5 tons. These are divided as follows :—*Druggist's bark*: Succirubra quills, 428 cases; broken quills and chips, 351 bales; root, 89 bales, Officinalis quills, 13 cases; broken quills and chips 114 bales; root, 58 bales. Ledgeriana broken quills, 3,169 bales; root, 744 bales. Hybrides quills, 69 bales; broken quills and chips, 85 bales; root, 20 bales. C. Schuhkrafft quills, 8 cases; broken quills and chips 1 case. Total, 4,699 bales 450 cases. All the analyses are not yet published.—*Chemist and Druggist*.

THE LINNEAN.—A meeting of this Society was held on June 19th, Prof. Charles Stewart, President, in the chair. Messrs. W. H. Beeby and Mr. H. E. Milner were admitted, and Messrs. W. Cross and S. Schonland were elected Fellows of the Society. Mr. W. H. Beeby exhibited a specimen of Rumex propinquus, new to Britain, and procured in Shetland. Mr. Thomas Christy exhibited, and made remarks upon a specimen of Callistemon rigidum. Mr. E. M. Holmes exhibited some marine Algæ new to Britain, including Ascocyclus reptans, Halothrix lumbricalis, Harveyella mirabilis, Sorocarpus uvæformis, and Vaucheria litorea; also specimens of Rhodymenia palmata with antheridia, and Punctaria tennuissima in fructification; the last two not having been previously recorded to occur in this state in Great Britain. The following papers were then read:—"Observations on the Protection of Buds in the Tropics," by M. C. Potter; "On the Distribution of the South American Bell-birds belonging to the genus Chasmarhynchus," by J. E. Hartney; "On the Vertical Distribution of Plants in the Caucasus," by Dr. Gustav Raddes; and "Notes on the Forficulistæ, with descriptions of new genera and species," by W. F. Kirby. This meeting terminated the session of 1889-90.—*Gardeners' Chronicle*.

PISCICULTURE IN CEYLON.—There arrived at Colombo by the B. I. S. S. "Goorkha" yesterday morning, consigned by Dr. Thurston at Madras to Mr. C. J. R. LeMesurier, four young specimens of the fish Gourami which were first brought from Mauritius, but are now to be found at both Calcutta and Madras, and grow to 12 lb. or 15 lb. One of the four was found to be newly dead and justified the reputation of its kind shortly after by making a savoury dish; and the others were alive and well. A fifth had died a day or two before. Those to hand are intended for the ponds at Kandy, viz; one at Lady Horton's walk and two in the Pavilion grounds which Mr. LeMesurier is staking and also using for breeding grounds. When he returned from Madras at the begining of the year he brought some Gouramis and also specimens of the Labeo and both are believed to be doing well. Fishes of several other kinds too, arrived in July last, and have all been placed in the Kandy ponds. Mr. LeMesurier has only carp and trout in the Nuwara Eliya streams. In the budget now before Council there is a vote for R2,000 for this good work, which in time we hope will realise the plan of the principal promoter, which is to supply many villages with their little fish ponds and stocks of edible fish.—Local "Independent."

THE "ONE-COCONUT-PER-TREE-PER-ANNUM" TAX.—We forgot to refer to the actual incidence of this tax. The usual number of palm trees to the acre is about 75 and the incidence of the single-nut tax would therefore be on an average, we suppose, about R2 per acre per annum. Now, we have in our possession a letter from the late Dr. Sortain who knew as much about coconuts as anyone of his day, most seriously alleging that a direct tax of 2s 6d (old currency) or R1·25 per acre on coconuts would suffice to ensure the abandonment of a large extent of cultivation under the auspices of foreign capital. He alleged that the margin of return was so narrow beyond actual outlay year by year, that there could be no other result. We suppose Dr. Sortain had then in view a coconut land-tax in addition to the grain levies. How he would view the matter if both grain taxes were simultaneously abolished, we are not prepared to say; but his opinion is of value as showing that of the "milk in the coconut," very little often falls to the absent proprietor—in other words that while coconut properties in some cases—in the Western and North-Western Provinces undoubtedly—are very often valuable; in other instances, they scarcely pay their way. Nevertheless, that coconuts, with every other form of cultivation in the island, pay their share of existing taxation—both through grain and salt,—is undoubted.

CEYLON TEA IN RUSSIA.

We call attention to the interesting, not to say piquant, Report furnished by M. Rogivue to the Ceylon Tea Fund Committee of his operations and their results in Russia. Returning as M. Rogivue is to that country with a fresh supply of "the sinews of war" we may fully expect a large amount of actual business in Ceylon teas through his agency; while the recent official recognition of our product and the well-known active interest of the Russian Consul (M. de Frisch) at this port afford a further guarantee that we are on the eve of a regular tea business with Russia. Curiously enough, last evening we received a letter direct from St. Petersburg, from the gentleman to whom M. Rogivue refers, whom we first met at Vichy in France three years ago, Mr. W. Barnes-Stevani who is the correspondent of an influential English journal in Russia. Before we met him, he had interested himself in the mission of Sir G. H. D. Elphinstone to St. Petersburg and Moscow, when "Logie" went over to introduce our teas into Russia. Our friend has special influence it will be observed, and although he supposed that he, if any one had a special claim on the Ceylon Tea Agency, he very cheerfully accepts the situation and promises his cordial support to M. Rogivue in his attempt to convert the Russian people to a full appreciation of the merits of Ceylon tea. For this assurance of co-operation, Mr. Barnes-Stevani will deserve a cordial vote of thanks from the tea planters of Ceylon. We quote as follows from his letter:—

St. Petersburg, Sept. 30th (Oct. 12th).

I received your very welcome letter a few days ago on my return from a long journey in the Caucasus on the confines of Asia.

I travelled in the State train of the Minister of Finance with one of the minister's old friends, so you can understand I had a grand time of it. Now I am again here in the capital of the frozen north, thousands of miles away from the sun, the wind and the beautiful scenery of the Caucasus.

AND NOW ABOUT CEYLON TEA,—

I was sorry to hear that the planters had already appointed an agent, especially as I had made such sacrifices in Moscow to introduce the tea in that centre of conservatism and superstition and was the first Englishman here who foresaw the great future this tea has in Russia. It is now about 5 years ago since I first found the tea at Mr. Henikey's in London and resolved to introduce it in this country. It has, however, been reserved for another to take my work and reap where I have sown. I not only believe that Ceylon tea will make its way into the Russian markets; but that this tea and tea grown on the Himalayan mountains might be transported into Russia direct through Afghanistan at a great saving of time and money, if we could only come to some agreement with Russia about the Eastern Question. I have friends, Russian engineers, who have built thousands of miles of railway, who would build a railway through Afghanistan "like a shot," if the Governments could only come to a "modus vivendi." I am pretty convinced that Russia does not want India. She has in Central Asia, Siberia and the Caucasus more wealth and more land than she can develop in the next hundred years. She is however, wishing to get to the sea either through Constantinople or Persia. The Russian Empire is entirely self-supporting. It has everything within itself, and all that she requires to do for the next 50 years is to plough, dig and build. If her statesmen are all as sensible as M. Vishnigradsky and the Tsar, they will do it; but should they die we know not what may happen. In my last journey I travelled day and night for five days without coming to the end of Russia. Another friend who has just returned from a journey of 10,000 miles in Russia and Turkestan states that he is simply astounded at the wealth, power and resources of this country, still in its first youth.

I shall be very glad to assist Mr. Rogivue in this work as far as my duties as Correspondent will permit. He seems to be still very unused to the ways of the Scythians or in Shakespearian English, a little "green." For all that, I believe the planters have hit upon a firstrate man, energetic and honest. One cannot know Russia in a day and what knowledge I possess of the country I shall be glad to place at his disposal if he requires assistance. I believe I can help him in many ways, but principally in getting the Russian press to direct public opinion to the new tea and to write favorably about it. This I can do, being personally acquainted with the press men on most of the papers in Petersburg and Moscow. This is very important. The "Press" in the country can make or mar this business if they choose. I know more than one business they have ruined by their attacks at its very commencement.

CEYLON TEA IN RUSSIA.

Kandy, Nov. 5th.

To the Editor, *Ceylon Observer*.

SIR,—I beg to enclose letter received from Mr. Wm. Martin Leake, Secretary, the Ceylon Association in London, transmitting Mr. M. Rogivue's Report on the subject of making known and pushing the sale of Ceylon Tea in Russia. I also enclose copy letter from Mr. Rogivue.—Yours faithfully,

A. PHILIP, Secretary.

London, Oct. 16th.

A. Philip, Esq., Secretary of the Ceylon Planters' Association, Kandy.

Dear Sir,—This is to inform you that Mr. Wm. Martin Leake, the Secretary of the London Association is posting by today's mail to your care my general report upon my mission in Russia on behalf of the Ceylon Tea Fund which I trust will meet with the approval of your Committee.

At a well-attended meeting of this Association held yesterday, I gave the gentlemen present an illustration of the work done by me in Russia during the past two months and of what remains to be done in order to introduce Ceylon tea into the country.

I came to London with the intention of making arrangements with some friends to open depôts and retail places in Moscow and St. Petersburg for the sale of Ceylon tea and I am very hopeful to be successful in my undertakings, so to enable me to return to Russia with the shortest delay.

Thanking your Committee for the grant of funds voted recently to be placed at my disposition for the continuation of my mission, I remain, dear sir, yours faithfully, (Signed) M. ROGIVUE.

Ceylon Association in London, 4 Mincing Lane,
E. C. London, 17th Oct. 1890.

A. Philip, Esq., Ceylon Planters' Association, Kandy.

Dear Sir,—Since I wrote to you on the 26th ultimo I have had the pleasure of receiving your letter of 15th ultimo forwarding copy of resolution of the Standing Committee of the Tea Fund under which R5,000* are placed at the disposal of Mr. M. Rogivue for further prosecuting the sale of Ceylon tea in Russia.

This liberal vote has given very general satisfaction here and to no one more than to Mr. Rogivue, who has just arrived in London in excellent health and spirits.

He has handed me a very interesting report of his proceedings of which I enclose a copy for publication in Ceylon.

He is doing his best to make all possible arragements for strengthening his position for renewing the campaign. And he proposes to return to Russia very shortly.

On Wednesday last both he and Mr. Grinlinton attended a meeting of our Tea Committee here and told us, each the tale of his travels.—I am, yours faithfully, (Signed) WM. MARTIN LEAKE.

* *Sic*; but M. Rogivue speaks of £150?—ED. *T. A.*

HOW TO INTRODUCE CEYLON TEA IN RUSSIA?

GENERAL REPORT ON M. ROGIVUE'S MISSION TO RUSSIA.

The Ceylon Planters' Association "Tea Fund" having, in several of their meetings, discussed the very important question of finding the best mode, to be adopted for introducing Ceylon tea in Russia in view of the securing new markets for their ever-increasing production, had once contemplated to send a Commissioner to China with the idea of his interviewing there the Russian buyers' agents by way of showing them samples of pure Ceylon tea and persuading them to devote more attention, when passing through Colombo, upon this interesting product, which offers so great advantages over the tea grown in the dominion of the Celestial Empire, viz. of being pure, of *greater aroma, stronger* and therefore *more economical* and *cheaper*. This idea, although perhaps good in principle, was however soon abandoned for some reason or other, but chiefly on account of the great criticism started against the scheme by the Colombo press, the *Ceylon Observer* especially. Seeing this, and at the eve of my departure for a holiday trip to Europe, I offered the Ceylon Planters' Association to take the "bull by the horns" and to go to Russia—the great tea-drinking country—there to advertise and push pure Ceylon tea, by trying to persuade her inhabitants to drink it and to appreciate it for its own merits.

My offer was accepted and a grant of £100 *cash* for my expenditure and £30 for value of tea samples to be taken to Russia for distribution, was voted by the Committee of the Ceylon "Tea Fund."

I left Colombo on the 13th of May 1890, via Italy and Switzerland, and arrived in London on the 22nd June, where I spent about a fortnight in collecting information about Russia, visiting merchants and brokers connected with the tea trade, tasting teas likely to suit the Russian market and making myself ready for the campaign, well-provided with numerous letters of introduction for Russia.

Very little indeed seems to be known in London about Russia, her tea trade and the way of making and drinking tea there. I was told that the sorts most likely preferred to suit best the taste of the people in general would be teas of a *light mild liquor* and *very light-coloured infusion* and therefore, with the aid of the London brokers, selected my samples accordingly and, as near as possible, to represent this description, taking with me 4 chests and 6 half-chests of the following teas:—

Labukelle	... ...	Broken Pekoe
Do	... ...	Pekoe
Aberdeen	... ...	Pekoe
Mahousa	... ...	Pekoe
Patiagamma	... ...	Pekoe
Ferudale	... ...	Pekoe
Gleugariffe	... ...	Pekoe
Rahatungoda	... ...	Pekoe
Labukello	... ...	Pekoe Souchong
Kuruwitte	... ...	Pekoe Souchong

In all 671 pounds nett of tea, and well-equipped as above-mentioned, I arrived in St. Petersburg on the 23rd July and lost no time in visiting the people for which I had letters of introduction. I may here mention that I have been very well received by all, the class of men to which these friends belong being indeed very civil, courteous and obliging, and not speaking of the dangers and bothers of all sorts shown to me in expectation by many, before leaving England, I found my way very easily everywhere and without the slightest trouble. Mr. D. Haverlands, the agent in St. Petersburg of a large London Export-house, to whom I was also introduced by a kind friend in London, after having heard me, for more than two hours, on the subject of Ceylon tea, told me that, previous to my visit, he very often received samples of Ceylon teas, with offers from Firms abroad for inducement of business; which samples, on account of his being always quite unable to interest anyone in the article, so very little known in Russia, he had to lay aside as an unsaleable produce, but, since he had heard from me more about its qualities,

the way it is manufactured, its purity, flavour, cheapness, &c., he now believed it to be the article *of the future*, called to supplant Chinese tea against the quality of which so many complaints have been raised lately, and he was very pleased to accept my proposal to act as my general agent in St. Petersburg.

It took me some long time—fully six days—before I could clear, at the Custom-house, my samples landed per S. S. "Viatka," the Custom authorities in Russia being very slow in their work and great *paper-wasters*, not speaking of Government recognized holidays so numerous in the country and as inconvenient to a business man.

Duty on tea in Russia is *21* gold roubles per pound of 40 Russian pounds, of which 124 equal to 112 English pounds, or one hundredweight.

Exchange on gold varies from 30 to 40 per cent at present and is regulated by the value of the "Demi-Impériale" which at par is worth "*five*" *silver roubles* (100 gold roubles equal *now* about 136 silver roubles.) Exchange on English money has fluctuated during the last two months

from roubles 8·40 kop = about 6·90 gold per demand £
to " 7·90 " = " 6·50 " "

The present mode of passing a tea invoice at a Russian customhouse is to *produce* the invoice which may be passed *as it is*, or verified by the Customs authorities taking about 10 cases out of 100 to verify the tares of which the weight is accepted as the average for the whole invoice. Duty is paid on this average nett weight without any addition of 3 per cent as it was done formerly; it is therefore most important that the very exact weights are given in the invoices and that the packages, cases or chests, are, as much as possible, of a uniform weight for the tare.

After having cleared my samples, I stored them in a local rented by me for the purpose, got them packed as per pattern herewith, in $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$ lb. packets, and, with Mr. Haverlands, began my work of excursion around the place, visiting all the principal wholesale tea-houses, such as A. W. Rothermandt & Co., Elissajeff Brothers, Barchard Gruening, Otto Dittborn, Raftal Brothers, Wm. Strauss, Schlaisser & Co., and others. My samples were tasted by all and, generally speaking declared good, wanting however more colour but everyone told me that, although there was no doubt that these teas were of very good quality and pure, it would be very difficult, if not imposible, to introduce them in the country; their taste being quite different to that of Chinese teas would never be appreciated by the Russian public; some pretended that their very peculiar "raspberry" taste was caused by the sweetness of the Neva's water (I was told that a well-known St. Petersburg tea dealer, when going to Moscow and/or Nijni to purchase teas always takes with him a supply of the Neva water in order to taste teas with it); many called Ceylon tea "flower" or "medicinal" tea and some others upheld the opinion that its aroma and flavour are given artificially. I found out that about 1000 chests of the best Ceylon Pekoe are yearly finding their way into St. Petersburg for mixing purposes with inferior Chinese teas wanting strength, aroma and flavour, quite unsaleable as they are. A Firm (Dittborn & Co.) has promised me an order of some importance but, after further consideration, for some reason or other expressed their regret of not being able to do so at present. However, for all this, I did not lose courage I had only heard the opinion of the wholesale trade, I wanted to be quite convinced about the matter and knowing that the small traders, retailers and the Russian public had never had before the opportunity of seeing, selling, buying or drinking *pure* Ceylon tea, never offered before *as such* on any Russian market, I decided to see them and to have their *direct* opinion regarding the *genuine article*. I therefore, with samples and circulars about me and accompanied by an interpreter, started on a regular expedition —a crusade—visiting daily, in almost every quarter and street of the town, small tea dealers, retailers, shops, hotels, "Tractires" (Russian tea drinking places), restaurants, public bars, &c.

To the *dealers* I said:—"Give me for my mouey a pouud of pure Ceylousky Tsohai"; the reply was of course "Sorry nono" everywhore. I then handed them samples asking them to get the same article for tho next time I would call, and sent afterwards some friends to ask them the same thing.

In the Restaurants, *Tractircs* and public bars I asked for a glass of tea which, on being served and after having tasted it, I rejected indignantly complaining of its bad taste and asking for the only good and genuine "Pure Ceylon Tea" of which a sample packet was most graciously presented to the owner of the establishment. A well-patronized and largely frequented "Tractire" has served, for more than a week, to its clients the pure Ceylou tea without anyone knowiug it and anyone complaining about the quality!

Hotels, friends and new acquaintances were also presented with a ⅛ or ¼ lb. packet, and very numerous are those who told me, the next timo we met, "Your tea is very good, excellent, economical and cheap, where can I buy it, givo me another small packet for my friend so-and-so." I did this for about a month in St. Petersburg, which place I left for Moscow on tho 24th of August, well convinced that Ceylon tea will, before long, be drunk *pure* and largely by many people there, aud leaving samples to some friends with the task to continue, in the above manner, the work commenced by me; more was for me impossible to do, the wholesale trade refusing peremptorily to bite at business.

With about 200 lb. samples of tea, I arrived on the 25th August in Moscow which is no doubt the large central place in Russia for tea business, but there I met with the same objections from tho part of the wholesale trade, viz. that Ceylon tea do not suit the taste of Russians and can only be used for mixing with inferior Chinese teas—about 3,000 chests of Ceylon tea are now used yearly in Moscow for this purpose, and this in the best qualities of pekoe and pekoe souchong, such marks as Labukelle, Chapelton, Rahatungoda, Bogawantalawa, etc.—My best eloquence was useless and could not convince them, and when I suggested to some of them that they would certainly find it a paying business to introduce Ceylon Tea by way of *retail*, in order to give the Russian public the opportunity to buy it and drink it pure, their unanimous reply and argument was: "The taste is against it and moreover why should we now help the introduction of this Tea to prejudice the sale of other marks and qualities we have taken the trouble to introdnce and which are now selling well and readily on this market; it would be against our own interest, we would simply spoil our bnsiness and stand the risk to keep in stock perhaps for some long time and at a loss for us an unsaleable article." One firm, however, well-known in Loudon, who has, quite recently, started in Moscow a semi-retail Chinese Tea business, on hearing that it was my intention to open such a business for Ceylon Teas, meutioned to me their willingness to take up the matter in hand and to order through me, *direct from Ceylon*, a yearly *unlimited quantity* of tea, provided they were alone to import these teas, have a sort of monopoly for the article, and that I would bind myself towards them, not to do any business with any other firm in Moscow and not to open myself any store or shop of any kind for the sale in *retail* or *otherwise* of these teas. Such a thing, I was of course unable to guarantee, as it is quite impossible to prevent other Firms to import Ceylon teas and boing myself unwilling to be cut of some scheme which I am contemplating to arrange. Seeing all this, I began in Moscow the same campaign that I had done in St. Petersburg, distributing samples and circulars to almost all hotels, tractires, restaurants and public bars of the town, also to the numerous friends and acquaintances I made there. The resnlt were the samo as above, and after a four days visit in Nijni Novgorod whero I was at about the end of the fair and my samples were also tasted by many people—Russians, Tartars, Siberians, Armenians, etc., I feel now sincerely convinced that Ceylon tea *can be* and *will be* drunk *pure* in Moscow as well as in St. Petersburg, or any other place in Russia, as soon as it is placed within *direct* reach of the public—the consumers. A few months time and some "réclame" are only wanted to establish there a good and profitable business, and here I will take reference to Mr. Wm. Barnes Stevani's—St. Petersburg correspondent for the *Daily Chronicle*—letter, published in the *Overland Ceylon Observer* of the 21st August last when he writes:—"And that Russians will drink Ceylon tea I am convinced," etc., and further of his advocating the opening of a shop or shops, as being the best plan to be adopted for its introduction in Russia; this would soon compel the wholesale merchants to come to the front with their ordors. The idea has long been mine, and having, for the present, no need to remain any longer in Russia—leaving the remainder of my samples to the care of a trustworthy and competent man who, during my absence, will continue my work of "réclame" and advertising, I left Moscow on tho 29th Sept., via St. Petersburg on my way to London where, upon the suggestion of some friends, I intend trying to interest some capitalists in a scheme of this kind.

When passing St. Petersburg, the other day, I was agreeably surprised to be asked by many: When and where Ceylon tea would be sold in retail; and I am sure that there and in Moscow had I had a stock at my disposal, I would have been able to sell more than a thousand pounds without any trouble at all to friends and acquaintances only.

In Moscow, I had the pleasure of the visit of Mr. Geo. Seton, an Assam tea planter, who, introduced to me by Mr. Martin Leake, was visiting Russia on behalf of *Indian* teas; we visited together most of the largest wholesale tea houses and after having heard all that they they had to say *pro* and *con* Ceylon and Indian teas, we both agree to the same conclusion, viz.:—That their introduetion into the country was only feasible by way of depôts and retail shops aided at the beginning with some well-conducted and judicious réclame by pamphlets, circulars and advertisements or articles in the press. Mr. Seton went so far in suggesting the opening of Ceylon Tea-drinking places on the tractires style, and a friend of mine suggested the "automatic" machines. An exhibition for French products is to be held in Moscow about June next, and although other nations' products will not be allowed to be exhibited I have ascertained that a space, outside the exhibition, could be obtained for the building of a Kiosk and the sale in cups and in packets of Ceylon tea.

I may mention that Indian teas have very little chance of success in Russia, they are found too strong with an indifferent flavour and aroma reminding the smell of fermented hay and so different to Ceylon and China teas. Chinese teas are sold in Russia from Rouble one to Roubles 3·50 per Russian pound, as to quality, those below Roubles 1·50 being very bad—samples herewith—and with better qualities aud cheaper prices Ceylon teas are bound to have preference. The qualities I would recommend as being most likely to suit the markets aud sell well, are tho following:—*Finest*, even made, leafy Orange and Broken Pekoe, *without tips*, of superior *rich* but *smooth* liquor, fine Moning flavour, mild taste, not too strong, not pungent or bitter, dark-red infusion, to sell, duty paid at about Roubles 3 per Russian lb.

Finest Pekoe	of above description	Roubles 2 50 per Russian lb.
Fine Do		do 2 do.
Good Do		do 1·75 do.
Good ordinary ordinary and common to sell about, duty paid, Roubles 1·50, 1 35, aud 1·20 per lb. respectively		Pekoes and/or Pekoe Souchongs, leafy, smooth flavour and good liquor, rather strong but not pungent, Moning taste, dark liquor.

Also *common Pekoe Souchong* of a dark colour infusion, rather strong but not pungent, to sell duty paid at about Roubles 1, 1·5, 1·10 and 1·15 per lb. or lower if possible. I have seen in St. Petersburg whole leaf China tea costing in London 4d a pound (English) f. o. b., and sold in

retail at 90 kopecks per Russian pound. Tippy teas are to be avoided, not being at all appreciated in Russia, but leaf, colour of infusion, and smoothness of liquor are the most important points to be taken into consideration.

Mr. Vladimiroff, of the large firm of Alex. Joubkin, héritiers A. Kansuatzoff & Co. the largest teahouse (wholesale) in Moscow, whom I have seen in Nijui-Novgorod, in giving me the accompanying complete collection of Chinese "Monings," told me that if Ceylon planters could only give to their tea the appearance, taste, flavour and perfume of these teas—which qualities and character are, I suppose, due to the difference of soil—he would be prepared to guarantee that before long time had elapsed, no other tea would be drunk in Russia; he is already of opinion that Ceylon teas, which he himself declared to be of very good quality, have a great and near future in the country on account of the evermore decreasing quality of Chinese teas in general of which everybody is bitterly complaining at present.

I have been showed some awfully bad qualities of a stuff that I certainly cannot call tea—"caravan or Overland Tea"—sample produced—sold at one rouble per pound, and I was astonished to hear that such drug was allowed to be sold and not stopped by the Police authorities as being infectious, and I really cannot understand the nonsense of the Russians as regards their so-called *taste* for tea, when they can drink such a filth, and drink it as they do, so weak and almost tasteless by dozens of glasses in a day, very seldom with sugar or a slice of lemon and almost never with milk or cream.

Caravan teas have greatly fallen off in importance for the last five years and the import into Russia by Overland route has been considerably reduced; good teas arrive now all by steamers direct to Odessa by Volunteer Fleet steamers, or with transhipment at Port Said by other steamers, and from London to Odessa, Riga, Revel and or St. Petersburg.

Green Ceylon or Indian teas will never do for Russia, their colour and taste being not suitable for the market.

The Russian "Samovar" or "Selfboiler" is a capital invention, it resembles the old-fashioned English tea urn still in use in some English country households. It is heated by a charcoal fire let into a tube in its centre, just in the same way in which the urn used to be heated by means of a red-hot bar, the charcoal fire keeps smouldering for hours, and the water in the urn is thus kept at boiling-point for the whole of tea-time. The mechanism of the Samovar is extremely simple. A cover, to which is adapted a safety steam-valve to prevent the bursting of the machine, recovers the urn which is filled up with water from the top, another small cover on the top of the tube serves in regulating the fire, the hot water is let out by a tap fixed at the bottom of the urn and two handles—one at each side of the Samovar—servo to carry the whole apparatus, which is considered an indispensible adjunct to the Russian tea or breakfast table.

Tea is made in the following manner:—the required quantity of tea (leaf) is placed in a beforehand heated tea-pot which is filled up slowly and gradually at intervals, with boiling water from the Samovar, and then placed on the top of the tube for about five minutes when it is supposed that the tea is ready and fit to be drank, glasses are then filled half-full with it, with an addition of hot water, the tea-pot is again refilled on the same leaf for a second infusion and this goes on for three to even four times without addition of any new leaf. This explains how the Russians drink so weak tea and why they require it of a strong colour, to keep up as dark as possible, up to the third or fourth infusion.

Regarding the packing of Ceylon tea, I have already written on the subject to the Secretary of the Ceylon Planters' Association, and I think, in view of further and larger business with Russia, some steps ought to be adopted for the adoption of better packages, better made, with a nicer appearance, and of even *sizes*, containing about 60 to 65 pounds nett of tea. The weght of the packages for *tare* should be *uniform*, so near as possible, in order to facilitate the Customs entries, and these very exactly given in the weight notes and or invoices.

Living and travelling, etc., in Russia is rather expensive. I have spent during these three months travelling—on account of my tea mission only—and up to the day of my return in London (on the 14th Oct.) the sum £190—inclusive duty and charges on tea samples—against which I have received £145 only from the Ceylon "Tea Fund," for which expenditures I am prepared to furnish detailed account. I am very thankful to the Committee of the "Tea Fund" for their further grant of £150 advised to me by Mr. Leake and in conclusion of this report, I again strongly advocate the opening in Moscow and or St. Petersburg of Ceylon Tea Depôts and retail shops for the establishment of which I am prepared to subject all the necessary information, and I sincerely trust that men with capital, members of the Ceylon and London Associations, will kindly help me for the realization of my scheme, which I can guarantee as being a good one, not only financially speaking, but also in the interest of the Ceylon tea industry.

I am ready to return to Russia within the shortest time.

(Signed) M. Rogivue.

London, the 15th October 1890.

CEYLON TEA FOR THE CONTINENT OF EUROPE:

THE NEED OF SUPPORTING THE COLOMBO MARKET.

(From a Colombo Tea Buyer.)

Our Continental correspondents write as follows:—"If there were only a larger selection on your market we might probably have done a larger business together by this time." In another part of the same letter they say: "We must have a little to go on with, as we have introduced this class of tea into some parts."

Fruit from Jamaica.—In this article on the awakening of Jamaica, in the latest *Nineteenth Century*, Sir Henry Blake mentions that within the past ten years the value of fruit annually exported from that island has increased from £40,000 to £337,000. The fruit is principally bananas, and the demand is likely to continue. "The value of the banana as food for working men has been recognised in the United States, and it is found peculiarly sustaining for those engaged in heavy labour in warm situations, such as blacksmiths and iron-founders. The operatives in cotton factories also use it largely. In England it is but little known, but Jamaica bananas are now being exported to Hamburg *via* New York." Sir Henry thinks this fruit trade is only in its infancy, and no doubt he is right.

The Word Sugar.—Webster defines "sugar" as "a sweet, crystaline substance." In ordinary use the word refers more to cane sugar than to any other kind. The oldest form of the word is found in the Sanskrit, *çarkara*, candied sugar. In Persian it is *shakar*, and in the Arabic *ookkar*. It is not a little curious to find this word in the Old Testament under the form of Issachar, meaning wages, sweetness. "Leah said, God hath given me my hire, and she called his name Issachar," sweetness. Though known and used in Asiatic countries from time immemorial, it was little known or used in England, except as an apothecary's drug, until within a few centuries past. There is no modern word that takes the place of that of the early ages. In Chinese the word is *che*, and as the character expressing it is original, it is claimed that sugar cane is indigenous in China.—*Sugar-Bowl and Farm Journal*.

PROGRESS IN OLD KADUGANNAWA: COFFEE AND TEA.

We hear very favourable reports of the young tea plantations in the old Kadugannawa districts. Mr. Akbar's 200 acres in tea at "The Farm" are described by a competent authority as very fine. On the other side, the young estates of Messrs. Thomas and Shelton Agar are promising; also one belonging to Mrs. Burt; while close by a spirited native gentleman is opening land with Arabian coffee as well as tea. May success crown his enterprise in both products.

CACAO PODS DISAPPEARING!

(*The Enemies of a Cacao Planter.*)

Nov. 6th.

I have been smothered with work lately: uneasy lies the head that thinks of cacao pods, as there is now a regular industry in stolen cacao. Which of the Colombo firms are the final 'receivers'?

The Census Commissioner might, while revelling in figures, add a column to his lists for the cacao districts for the headmen to fill up, showing the number of villages owning no property and doing no work! This would help to explain why half of our crop never reaches the drying-house.

DR. VOELCKER.

SIMLA, Oct. 28th.—Dr. Voelcker leaves Simla about the 21st of Nov. and proceeds to Poona, and sails from Calcutta en route for London on the 18th of Dec.—Thursday's "*Observer.*"

Dr. Voelcker, we learn, is due in Colombo on the 23rd Dec. and will be the guest of Mr. T. Watson Hall for three or four weeks, during which time he intends taking a trip through the planting districts. We are very pleased to have this intelligence. The Planters' Association should arrange to show some special attention to this great agricultural and chemical authority.

PADDY CULTIVATION IN THE EASTERN PROVINCE.—We call attention to the very important Report furnished by Mr. Elliott on the careful experiments carried on under his direction by Agricultural Schoolmen with paddy culture in the Batticaloa district. The full details given are most interesting and certainly give us a new idea of the scope that exists for improvement in local grain cultivation by the people and of the really handsome profits per acre that may be realized. Of course no one will say that careful experiments on selected fields can be equalled over a wide area; but Mr. Elliott shows that the land taken up was only of an average description and that the bad season affected his experiments very considerably. So that we are forced to the conclusion that over the extensive paddy-growing fields of such exceptionally favoured districts as Batticoloa and Matara and no doubt over a great part of the Colombo and Negombo districts of the Western Province, not to speak of Madampe, Chilaw, and some other divisions of the island,—a clear profit of from R15 to R25 per acre in paddy-growing would not be difficult of realization if attention were given to such means of improved cultivation as are well within the cultivators' reach. It would be well if other Government Agents followed Mr. Elliott's example in carrying on careful experiments after the pattern he has set.

CEYLON UPCONTRY PLANTING REPORT.

PEPPER CULTIVATION—CACAO PODS AS FOOD FOR CATTLE—CACAO PROSPECTS AND PRICES—COFFEE AND COOLIES—DECLINE OF THE CINCHONA MARKET—WEATHER—LABOUR.

Nov. 6th.

The *Pepper* spurt, which about a year ago was very much in evidence, seems to have exhausted itself. You never hear anything of this spice by any chance, and when you do see it, and ask as to its ways and doings, the record is not an encouraging one. I begin to fancy that to grow it successfully a very rich soil is necessary; and when it has not got this it struggles along in a half-marked kind of way, vigorous enough just to keep hope alive but not to contribute anything reasonable to the exchequer. Now and then you fall on a vine that does gladden, with an exuberance of fruit; but this is the exception not the rule. I wonder how many who have gone in for it in Ceylon are satisfied with the present or the future outlook? Precious few, I fancy. We would all, however, willingly see an extension of its cultivation, as there would be a chance of making something off cuttings! With a flow of coin and a hopeful spirit abroad it is wonderful how bright life can become and how the potentialities of even Pepper culture would swell out.

Has anyone ever tried Feeding Cattle on cacao pods? Cattle take to it very kindly, and as far as I have seen without any evil effects, and it may be that what really is a valuable cattle food is allowed to run to waste at present for lack of knowledge. In a matter of this kind, however, the natural feeling is, that you would prefer another fellow to try in case of accidents! The piles of broken pods which accumulate in every cacao garden, need not be wholly wasted, as they can be and are returned to the soil as manure; but if it were proved that they were a good fodder, those gardens which had a cattle establishment would score.

The *Cacao* crop is coming in fast now, and it would seem as if in some places at least it will be quite as good, if not better than last year. This, however, is not to be the rule everywhere, as I understand that Dumbara is not going to do so well owing to the drought in the early part of the year. The grand prices ruling at home are very encouraging, and make up for a lot of former disappointment and worrying work in bringing the gardens into bearing.

The little *Coffee* we have on this side is looking fairly well for coffee, but it is very little. It, too, is ripening, but there will be no great rush over the gathering of it. It is strange how so many keep in touch with the old king; for there are few estates which have not got some trees about. A clump under a jak, or by the lines, or in the bungalow garden, is evidence of the past universal order. Then the cooly is not willing to let the memory of coffee die out wholly, for you find them referring to tea, as coffee; and they will speak of a line of tea as a "coffee nirré." I have noticed them even using the word coffee to cacao. I suppose this is language in the act of being made: and that by-and-bye the Tamil people in the hill districts of Ceylon will use the word coffee as a general instead of a particular term. It may puzzle some future philologist to account for this, but if he digs but deep enough he will discover what other students have often noted, that a single word may contain the compressed history of a great crisis.

What is to be made of this wretched *Cinchona* market? I don't know how many years ago it is now, since we all confidently looked for a

recovery of prices, and the rate is as poor as ever. The whole thing is simply disgraceful, and I am convinced that even Job himself, if he had been growing cinchona, or had held any for a rise, would long ere this have cursed and died rather than go on with it. When the price of the unit advances an eighth, there is consternation among the manufacturers, and the sellers of bark grow jubilant. I suppose it is the most sensitive market in the world, and that is why it makes so much fuss over so little. Anyhow an industry whose hopes have been bounded for years by about 1¼d on the one side and 1⅞d in the other, leaves precious little room for a fortune to the growers of the article, or for speculation either.

The Weather is very favourable for *tea* flushing, and the leaf comes on in a cheery way.

Coolies are plentiful, and are preparing for a lavish outlay at the "Tivali." The quantity of coin drawn from the banks about this time to pay wages on the estates must amount almost to a run on them. He will be a fortunate man who can afford a day to his labourers for holiday-making and stand the strain of the absentees later on. Few object to the holiday,—it is the after effects, and the time it takes some of our coolies to work it off. PEPPERCORN.

THE RUBY MINES OF BURMA.

As a gem-producing country Ceylon is interested in the following not very encouraging notice of the Burma ruby mines, evidently by Sir Lepel Griffin from the unworthy but perfectly characteristic attack he makes, in a part we do not quote, on the American missionaries and their Karen converts:—

The country leased to the Ruby Mines Company begins in the neighbourhood of Kyatpyin, but it is of great extent some 800 square miles in area, and is unsurveyed or very imperfectly surveyed. It includes the whole country in which precious stones are known to be found, except one or two outlying mines like Saygin on the Irrawaddy not now worked. The operations of the company have been delayed by the great difficulties of transport and labour and the impossibility of conveying heavy machinery across mountain roads in any but the finest weather. A large amount however, has now reached the headquarters, and is being put up; the stream running through the valley is being diverted, and mining operations on an extended scale are being begun. The labour question however, is one of difficulty. The best labourers are the Mainthas, who come from Chinese territory, and who are strong men and desperate gamblers, so much so that if any attempt is made to stop their unceasing gambling out of work hours they threw up their engagements and leave the place. These men hardly arrive in Mogok before January, and in April they are anxious to return to their homes to sow their fields before the rainy season. The labour procured from Mandalay or Lower Burmah is unsatisfactory and very expensive. Another difficulty the English Company has to face is the jungle fever, which is very trying to new comers, but it may be hoped that with better food and better conditions of living, and as the *employés* become acclimatized, this inconvenience will each year be less severely felt. Kyatpyin is the machinery headquarters of the company, its principal settlement being 12 miles further on, at Mogok, a large and flourishing town in a wide and beautiful valley, through which runs a stream of abundant water. The town is picturesque in the extreme, with groups of temples and pagodas. The houses, all constructed of wood and built on stilts in the fashion of the country, are substantial and commodious, and the inhabitants, all of whom live by the ruby trade, appear to be a most flourishing community, the women being covered with jewels, some of great size and beauty. We visited the weekly fair at Mogok, in company with Sir Charles Crosthwaite and his staff, and the sight was a striking and picturesque one, for men and women from distant villages in the Shan and Chinese hills, strange in appearance, especially the Kachyens flocked in from all directions, and their curiosity and astonishment at the sight of an English lady, who was followed by great crowds through the bazaar, was most amusing. Mogok is fast becoming an English settlement of some importance; it is the headquarters of the district, with a resident magistrate, and of the divisional military police, who are mostly Sikhs from the Punjab, while the offices and numerous wooden chalets of the officers of the Ruby Mines Company dot the hills surrounding the town. The great alluvial plain through which the river runs is excavated in many places by the shafts of the native miners, who have been allowed to work for rubies through many generations, and that they have found the occupation a profitable one is evident in their appearance and manner of living, but their system of digging shallow holes from which the water and mud is painfully taken out by baskets and buckets is not one which would be profitable to a scientifically working company, whose method would be more elaborate and more in accordance with the principles adopted in diamond mining in South Africa. It has not been found politic to oust the miners in the alluvial soil of the valley from their holdings, although, under the native Government, they held these as tenants at will for until Upper Burmah is permanently tranquil, it is unwise to take any action which would render hostile to the company those whose co-operation might be to its advantage. They have consequently been allowed to continue mining, paying for each person employed a poll-tax of 20 rupees. As about 600 miners are engaged in the work this brings in an annual revenue, of about a lakh and a quarter of rupees, while a useless embargo on smuggling having been removed, the miners more readily bring to the company's officers for purchase such of the good rubies as they find. This plan, which has been experimentally adopted, will be modified if its results are not satisfactory. In the hills about Mogok and Kyatpyin native miners with much larger rights of occupancy work open cuttings in the sides of the ravines, and it is to this work by hydraulic power that the company's operations will be chiefly directed. What may be the ultimate result of the company's labours it is impossible to pronounce, but much activity is now being shown, and, with the arrival of sufficient and effective machinery, the real operations of the company, too long delayed, will practically begin.

Two thousand feet above Mogok, by an exceedingly difficult mountain path, is the military station of Bernardmyo, some eight miles distant, and ordinarily reached by a military road joining the main line above Kyatpyin. It was hoped that the elevation of this cantonment above the sea, quite as great as those in the Himalayas, would have insured the troops against jungle fever: but this was not the case, and the great sickness almost caused the abandonment of the place. The health of the troops stationed there has, however, much improved of late, and, like all Burmese stations, the peculiar climatic conditions require a European resident to be somewhat acclimatized before he finds them healthy.—*Times Weekly Edition.*

It will be observed that the chief difficulties specified in the case of the Burma Company—scarcity of labour and difficulties of transport—do not in the least apply to the gemming country of Ceylon. Clearly British capital should have come here before it went to Burma.

ARTIFICIAL MUSK.—The comparative scarcity of musk, and its considerable use in pharmacy make the discovery of a substitute of some importance. Mr. A. Bour has succeeded in preparing a substance which, though not identical in composition with natural musk, yet is possessed of its peculiar smell. It is formed by nitrating isobutyltoluene with a mixture of the strongest nitric acid and fuming sulphuric acid. It is not poisonous, and is now being produced on a manufacturing scale in Germany.—*Industries.*

COCONUT BUTTER:

A NEW FIELD FOR EXPORT FROM CEYLON.

For some little time past we have been hearing rumours as to the successful extraction from coconuts of a butter which it has been asserted might eventually take the place to a very great extent, cf the genuine article. Information, however, respecting this new process has hitherto been of a very limited character, and from all that could be learned on the subject the experiments made seemed to have been of a tentative character only. It is, therefore, with considerable surprise that we have read the account given in the latest *Kew Bulletin* and which was summarized in our London Letter by last mail. To judge from what we have thus learned, the process has not only passed out of the region of bare experiment, but its success commercially has already been established, and a very great demand, far beyond the present means or meeting it, has sprung up.

To an island like Ceylon, which not only now produces an enormous yield of coconuts, but in which the cultivation of the palm bearing it is possible of still farther extension, the news now reaching us is of very material importance. But we deem it to be probable that local interest in the matter must to a considerable extent await the fuller development of the methods employed. Unless it be found impracticable hereafter to work the manufacture locally and with profit, the probability is that our own interest in it must be dependent upon the discovery of a method by which the extract may be obtained from the copra, the name by which the dried kernel of the nut is known. So long as the power of extracting the butter is limited to the fresh nuts, it is scarcely possible, we should say, that Ceylon, despite all its capacity for production, can compete in the supply of them to European countries, with sources which lie nearer home. For, after all, the question of the cost of transportation is a serious one in regard to the nut itself. The unbroken nut, even whon stripped of its husky covering, occupies much space relatively to the weight of kernel it contains, and this fact must, of course, increase the freightage greatly. Two courses, therefore, await experiment before this island can hope to share very largely in the supply for the actively increased demand which this new discovery is likely to cause. The most important of these would be the discovery of a method whereby the butter may be extracted from the dried kernels, while the second one would be the adoption of the process of manufacture locally.

The method of the latter process is unknown to us, nor does the *Kew Bulletin* afford us any intelligence with reference to it. The probability is, we should say, that it is—for the present at all events —a trade secret, and there can be little doubt that if it be so, the endeavour will be made to preserve to it that character as long as may be possible. The local prospect, therefore, of sharing in the advantages to be expected from this new invention must, it would seem, be dependent on means being found for the substitution of the dried for the fresh kernel. As to this, everything must depend as regards ourselves upon whether the drying which converts the juicy nut into a hard substance is inimical to the preservation of the constituents from which the butter is derived. This is, of course, a point upon which we are unable to express an opinion, but it is one which may well engage the attention of scientific chemists, and would even be of importance enough to our island interest to warrant our Government in seeking information from home. According to the *Kew Bulletin*, the new extract has a fair prospect of largely superseding the butterines, such as oleomargarine, &c., which are extractions from animal fats. Indeed we are told that it has already largely done so, and that the present demand ranges as high as 100 hundredweights *per diem*, while the existing means of production limit the outturn to 50 hundredweights only.

We may be sure that the official organ of the Great British Botanical Gardens would not have committed itself to the reproduction of these figures, had not its directors been possessed of good warranty for so doing, and we may therefore accept them as fully reliable. It is not difficult of belief that people would prefer a pure and healthy vegetable extract to one, the sources of which are open to taint and much suspicion. As regards these last we have even heard it hinted at that the soapy scum which rises to the surface cf the Thames at the points of sewage discharge into them is collected partly with the object of the manufacture from it of oleomargarine! Although we greatly doubt this, it is quite certain that many very base and disagreeable substances may be, and probably are, the foundation of much of the oleo-margarine sold. We have never practised the experiment ourselves of tasting this compound, but there is ample evidence of its very extensive manufacture and of its large and legally-practised sale. There is every likelihood that this substance will be largely displaced by the pure extract from the coconut if all that we have been told about the latter be correct. In that case we shall do wisely to keep "our eyes about us" in the hope that our native industries may largely benefit by this new departure.

BIG RETURN OF TEA.

Ruwanwella division of the Kelani Valley is in a fair way to take the palm with a return of tea per acre last month that beats anything yet recorded —300 lb. made tea per acre over about 30 acres flat, with the prospect of being repeated in the current month, are the figures given to us. Has this been beaten ?

UVA BEATING JAVA IN THE RICHNESS OF ITS CINCHONA BARK.

Our Java friends are fond of boasting of the superiority of their cinchona bark to any grown in Ceylon; but we should like to know of any single shipment from Batavia equal in weight, exceeding the analysis of the one we have just got particulars about. Last week a parcel of cinchona bark from the Messrs. Macfarlane's Canavarella estate, Badulla, of 28,000 lb. analysed in Colombo 5·10 per cent sulphate of quinine—so it will be seen that the Jave people—as our informant says—have not yet got the matter entirely in their own hands. This is the highest analysis for a large quantity of bark ever obtained in Ceylon we think.

CEYLON TEA PLANTATION COMPANY, LD.—A GOOD DIVIDEND.—We have come to regard this Company at the premier Tea Company of Ceylon, being the largess and one of the most prosperous. When, therefore, it does well, having interests in many districts of the island, and at both high and low altitudes, it certainly is hopeful for the Ceylon Tea enterprize generally. We are, therefore, pleased to be able to state that the last mail brought news to the Colony that the Directors of the above Company had decided to declare an *interim* dividend for the past half-year at the rate of 7 per cent per annum, which, considering the enormous rise in exchange which has occurred during the last five months, is a most satisfactory result, and one of which no one should be more proud than Mr. G. A. Talbot, the Manager of the Company, and the superintendents.

BOOK NOTICE.

SAP: DOES IT RISE FROM THE ROOTS?

By J. A. Reeves. (London: George Kenning.)

The purpose of the author, he tells us, in the beginning of his book, is to describe certain known facts, to lay before the reader an outline of the theories hitherto advocated, and to show that there is no evidence to prove "that the sap in trees rises at any time; that inorganic matter rises from the soil; that the soil is exhausted by the growth of vegetation; that sap is elaborated in the leaves; that suckers from the roots are injurious." The physiologist and the cultivator will at once see that the author has a hard task before him. It is quite true that contradictory opinions and conflicting statements have been and are held upon several of the points raised by the author, that very little is known for certain, and that very much remains to be done before all the questions relating to the movements of the juices in plants can be solved. It will be understood that the problem is partly physical, partly physiological—physical in so far as concerns the mechanism of the plant, and the forces which set the machinery in motion; physiological in what concerns the plant in action. Some knowledge therefore, of physics, of chemistry, of vegetable anatomy are essential, and the capacity of applying the principles derived from them to the explanation of the observed phenomena is no less a necessary condition. The author of the work before us attacks, with perfect impartiality, the views of his predecessors; so far as he knows them; he demolishes their arguments to his own satisfaction, and concludes by the assertion that, "instead of water ascending and gases decending, the facts ... go to prove that the water descends to the roots, and the gases ascend to the leaves, both actions being in strict conformity with the laws of gravitation.

Oppressed, as every physiologist and teacher must be with the unsatisfactory state of our knowledge on the subject, we should gladly hail our author as a guide, if he were able to show satisfactory credentials, and then to substantiate his statements. If we turn to his credentials, we find they are two-fold, consisting of "extracts from the best authorities;" and amongst these, while we find a few whose names carry weight, we find some who at best would only pretend to be compilers; and many others of a very miscellaneous character, whose opinions in such a matter, however honest, are of no value whatever as evidence. The author's references to the literature of the subject are ludicrous, as much for what he has omitted, as for what he has requisitioned.

In addition to these extracts from "the best authorities" and others, from writers who would certainly not claim any authority for themselves, the author lays before the reader a brief record of his own observations and experiments. We fear the physiologist will hesitate as much to accept them in their entirety, as he would to accept the author's literary evidence. In this department we naturally look for evidence of the author's personal knowledge and competence to deal with his subject. We find a great deal of assertion, much adverse criticism, some of which is, no doubt, legitimate; but some of which will fail in its effect from the inability of the author to prove that he is competent to deal with his subject. Take for instance, a passage on p. 48, and consider whether the physiologists would be likely to attach importance to the theories of a writer who can say, "The roots [formed from a Pelargonium cutting] being a hardened or solidified exudation of the sap [!], of course, grow from between the rind and the wood."

It is no wonder that a writer who can thus describe a root, should arrive at a very different conclusion as to root-action from other people. This question of root-action is the one in which cultivators will naturally take the most interest, and the reader perusing the pages of Mr. Reeves' volume, will naturally inquire—What is the use of the roots? So far as we can see from Mr. Reeves' pages, they can be of no use except as supports. If what he tells us be true, there is no need for root-watering at all. Manures are superfluous; root-pruning never needed; the care exercised in transplanting or in potting is so much waste labour.

Leaf-action, again, in the writer's views is reduced to little more than the absorption of water. Ignoring the teachings of physiologists, and the experiments of botanists, the author says boldly, "The elaborative function so constantly attributed to the leaves of trees appears to be nothing more than elaborated idea (*sic*) unsupported by the least evidence." Clearly the author has not read his Sachs, nor his Vines, nor has he observed to any purpose what happens when Celery is blanched.

Speaking of "suckers," the author's notion of what they really are seems rather vague, while his statement that a healthy tree has no suckers, may be contradicted by the first white Poplar or Elm he may come across.

In fine, whatever the deficiencies in our knowledge of the circulation of juices in plants, and they are great, we do not think that Mr. Reeves' book at all helps us to supply them. His teaching will not commend themselves to the practical horticulturist, while they will most certainly be repudiated by the botanists.—*Gardeners' Chronicle.*

SCOTTISH TRUST AND LOAN COMPANY OF CEYLON.

Report of the Directors to be laid before the Thirteenth Ordinary General Meeting of Shareholders, held on Friday, the 24th day of October 1890.

The Directors present their Thirteenth Report, being for year to 31st of August 1890:—

ESTATES IN COMPANY'S POSSESSION.—The cultivation of the estates in the Company's possessions continues to receive careful attention, and the sales of tea and coffee during the year have commanded satisfactory prices in the London market. The sales of cinchona were restricted owing to the state of the market, and part of the Company's produce has been retained in the hope of better prices The whole cost of tea cultivation has, as formerly, been charged to revenue. Acting on the advice of the Company's Ceylon agents, the Directors authorized the erection of a tea Factory at Kaipoogala, from which remunerative returns are anticipated. The outlay on Tea Factories and machinery amounted during the year to £655 10s, and the Directors have written off the sum of £745, 4s 6d, being one-fifth of the total expenditure on this account during the past two years.

PRODUCE ON HAND.—The valuations have, as formerly, been carefully made by the London Agent, and are largely based on the result of actual sales made subsequent to the date of the closing of the books.

MORTGAGES HELD IN CEYLON BY THE COMPANY.—Sundry payments have been received during the year in reduction of mortgages, and interest has been punctually paid, with the exception of the amount shown in the accounts, which, however, has been reduced since the books closed. Early in the year the Directors found themselves compelled to take active measures in connection with two Rupee Bonds standing in the Company's books at the old rate of exchange, at the *cumulo* sum of £11,000. The estates were known to be much deteriorated in consequence of the failure of the coffee, and tea cultivation had barely been commenced. The Directors were most averse to take over these estates, and judged it in the best interests of the Company to accept an offer of £8,000 payable by instalments in sterling money, which was made to them by a neighbouring proprietor. The loss of £3,000 arises in about equal proportions from the fall in Exchange, and the depreciation of the estates, and the amount falls to be written off. The Company now retains only one Rupee Loan, of about £1,000.

DEBENTURE DEBT.—The amount borrowed and the rates of interest have again been reduced.

The Balance at the Credit of Profit and Loss Accounts is £5,925 9 0
and the Directors propose—

To write off the above loss	£3,000 0 0
To pay a Dividend of 6 per cent, free of Income Tax	2,250 0 0
	£5,250 0 0
Leaving	£675 9 0

to be carried forward to next Account.

The Dividend will be payable, as before, on the 11th of November.

Under the rotation fixed by the Directors, Mr. Dickson retires from office at this Meeting; but he is eligible for re-election in terms of Section 14 of the Articles of Association.

During the year Mr. J. Campbell Penney, who has acted as Secretary of the Company since its formation in 1878, tendered his resignation on his appointment as Accountant of Court. The Director appointed Mr. Francis A. Bringloe, C.A., in his place.

The Auditor for the current year falls to be appointed. FRANCIS A. BRINGLOE, Secretary.

NOTES ON PRODUCE AND FINANCE:

THE CUSTOMS AND DUTY-PAID ARTICLES.—Instructions have been given to the Customs officials to furnish, for the information of a Committee of the House of Commons, a return of the quantity of duty-paid articles, including tea, coffee, wine, beer, spirits, manufatured tobacco and snuff, &c., consumed in England, Wales, Scotland, and Ireland respectively. The return asked for is to be rendered quarterly, commencing from the period ending Dec. 31st next, and all shipping and carrying companies are requested to furnish the Customs with an account of all such articles conveyed by their routes between each of the three divisions of the United Kingdom.

THE PRICE OF CHEAP TEA.—Tea was never so cheap as it is today, and never so dear, says a grocer's paper. It can be bought at any price from 1s per lb. A good deal was made of a parcel of Ceylon tea which fetched 30s 6d per lb. in London the other day. However, it appears that Sheffield can beat that, for we are informed that Mr. Tuckwood has in his Fargate stores a parcel of Ceylon tea for which he gave 55s per lb. in London, and the broker would buy it back at 60s.—*H. and C. Mail*, Oct. 24th.

ADULTERATION AS A FINE ART.—According to statistics produced in an American paper the average quantity of genuine coffee actually imported averages only 130,000,000 lb. per annum, but with roasted beans, peas, and rye and other coffee substitutes, an annual consumption of at least 216,000,000 lb. is provided for, some estimates indeed placing the yearly consumption of bogus coffee in the United States at 120,000,000 lb. We learn that the "bean" is still the most difficult to produce, but a good "specimen," composed of rye flour, glucose, and water, is now manufactured in Philadelphia and Trenton. It is further stated that "taking even the lowest estimate, the cute Yankee engaged in this particular field of 'commerce' makes 25,000,000 dols. a year out of his fellow-countrymen, the manufacturers taking six millons of this, and the retailers nineteen millions."

A NEW COFFEE COMPANY IN BRAZIL.—A Brazilian paper refers to the formation of an important company "with a capital of 50,000,000 dols. already subscribed, and 'which does not contemplate a monopoly nor a struggle with the intermediate exporter, seeking merely to direct the market towards stability, subject only to the natural fluctuations caused by consumption, limiting the bases upon which it proposes to operate, incurring none of the risks of exporting—it being forbidden to it to work in this direction—and making of itself only a great buyer which may resist for the moment artificial declines, at the same time facilitating transactions in the article." Occupying itself in all the industries accessory to the proposed business, the coffee-bagging company will establish the necessary workshops, will acquire warehouses and stores, will provide for means of carriage and shipment, and will establish agencies in the markets of New York, Havre, Hamburg, and London. At the head of this enterprise, of which the president is Visconde Cruzeiro, are as directors and auditors, Conde de S. Clemente, Conde de Figueiredo, Barão de Andarahy, Barao de Ipanema, Dr. João Baptista de Castro, and Comandadores Urbano Faria, Manoel de Araujo Guimaraes, and Joaquim de Castro de Silva.'—*H. and C. Mail*, Oct. 24th.

THE JAVA BUDGET.—The Amsterdam correspondent of the *London and China Express* writes in the issue of Sept. 26th:—

The Java Budget was introduced in the Second Chamber on the 22nd inst. The service of 1890 promises a more favourable result than in 1889, as there will be a profit balance of f.4,500,000 instead of a deficit of f.7,500,000. The expenditure for 1891 is estimated at f.136,840,616 and the revenue at f.116,414,315. There is thus a deficit of f.20,426,331 or f.12,916,926 more than estimated for 1890. The quantity of coffee to be offered at auction at 1891 will be about 190,000 piculs, against 520,000 piculs for 1890, and in the quantity of 190,000 piculs there are included 60,000 piculs reserved for the sale of 1890. In consequence of this the proceeds of the coffee is estimated at about f.15,500,000 less. * * * The average sale price of the coffee is estimated at 52 cents, against 48 cents last year.

In commenting on the budget our contemporary says:—

Almost the whole of the estimated deficit for 1891 is caused by the reduction in the quantity of coffee, which it is anticipated will fall short by 15,500,000 guilders of even the lesser income received in 1890. The quantity, according to latest advices, is only expected to total 190,000 piculs, against 520,000 in the present year, which itself was only one of a constantly descending sequence. It is not necessary to remind our readers that in past years the amount netted by the Government of Holland has been immense from coffee, and the falling off of millions of guilders shows how large they are. When some three years ago the receipts had fallen off to a large extent the Government appointed a commission to inquire into the whole subject, and though the members made a number of suggestions on the matter, all were not put in force, and the continued ravages of leaf disease have more than counterbalanced any modifications that were introduced into the method of culture. The *sereh*, or leaf disease, is a matter which may or may not be successfully combated in time. It is sincerely to be hoped that science may devise some means, but seeing that about one-third of the world's production of coffee is estimated to come from Netherlands India any other means that can be devised to again reinstate the production should be energetically applied. One great means would be to give the natives a greater interest in growing the bean. The abandonment of the compulsory growth enforced by the Government might be relinquished, or an increased price given to the native for the coffee he produces. This would give him a zest which is only supplied at the present time by the periodical visits of the inspector to see that the minimum number of trees is kept up. Perhaps, viewing other circumstances in Netherlands India, it would be better to increase the purchase price rather than abandon the compulsory growth. There are many places in the Padang Highlands of Sumatra which would prove suitable to its extension provided the remuneration was greater. The natives here have always been more antagonistic to the present system than have their *confrères* in Java, and the Government should seriously consider the question whether it would not ultimately conduce much to their own gain if they allowed to the native cultivators a reasonably fair share of the profits of the industry.

ESSAYS ON THE FERMENTATION OF COCOA.

(From the Trinidad "Agricultural Record.")

FIRST PRIZE ESSAY.

The fermentation of cocoa, or sweating as it is often termed, is very properly considered as an essential part of its preparation for the manufacturer's use. The priucipal objects to be obtained may he set down as the development of flavonr, tho snppression of the bitter principle, so marked in the Trinidad varieties, and a certain allotropic modification of its snbstance (*i.e.*, the Cotyledons) not easily recognised by chemical analysis.

Fermentation properly consists of decomposition or slow combnstion (oxidisation) accompanied by the formation of new products; in the case of cocoa this is spontaneons, and must by no means be confounded with the scientific methods known to malsters, distillers, &c., in tho process here desciibed, the object being not to deal with the products, bnt to affect the cocoa bean hy long continned heat, moisture, &c., and, fnrthermore, to remove the adherent pulp. This sweating must not be regarded either as a simple process; on the contrary, it includes, more or less, the secondary fermentations, such as the lactous, bntyric, mncous and pntrefactive or eremacausis.

The cocoa pnlp to be fermented is a viscons gummy mass not unlike tho snbstance of the custard apple or soursop, and contains an abundance of fruit sugar, cellulose and carbo-hydrates necessary to support combnstion or fermentation; it also possesses, as many other fruits do, within itself a natnral diastase and yeast ferment; having, therefore, been in contact with atmospheric air and then closed up in a chamber, packed wi h plantaiu leaves, &c., tho alcoholic fermentation is readily established, the self-contained natural ferments, as already described, being soon supplemented by conntless bacteria from the air.

If the mode of proceeding in sweating or fermenting cocoa was the same throughout, it might be easily described. Snch is, however, very far from being the case. The great difficulty is that the Trinidad varieties (termed on the Spanish Main "Trinitario") are so very different in character, "each suh-variety or hybrid reqniring a different period of fermentation," that the planter is at his wit's end to make his batch turn ont all alike, and nearly every one has, therefore, "a way of his own."

On the best estates in Venezuela the Criolo alone is planted, but as it was fonnd not to bear so well as the "Trinitario," onr seed some time ago was extensively planted along the Guiria Coast, but after a short experience they conclnded that the choicer and higher priced cocoa paid best, and I have myself seen planters in that district rooting out onr cocoa trees from their plantations.

Tho Criolo is mnch better flavoured than any other, and reqnires bnt three days' fermentation. This choice kind has heen extensively planted in Trinidad, but surronnded with inferior plants (and perhaps on inferior soil) it has becomo hybridised and assimilated to the native sorts, and has not maintained its supremacy, so we must ever look to the mixturo of Criolo, Forestero and Calabacillo, &c., with which we are blessed, only taking especial care in picking to exclude pasi or flat beans and unripe pods. If our varieties were well marked and we determined the exact temperature and the precise number of days that each kind wanted, then, as many persons advocate, it would bo well to separate them in the field, hut practical men know better than to attempt this, or, at least, on any large scale, and they are contented to deal with them as a whole.

The general practice in fermentation varies from that of the small *conuquero*, whose object is to realise quickly and to get the ntmost weight possihle, to the elaborate plan of Mr. F. Strickland extending over fifteen days. The *conuquero* pnts np his beans to drain and forthwith exposes them to the snn for, say, five or six hours, then heapod and packod np, they sweat afresh until tho following day, when they get five or six hours more sun and so on. He turns out a fair looking hean somotimes, and pays especial attention to its red appearance, inasmuch as he knows that the light red will always bring another dollar per fanega in the local market; this is true, and is probably owing to the fact of its weighing lighter and being cleaner, due to the more careful rubbing and removal of the gummy coating. In America this red cocoa is especially approved, and quite regardless of the interior condition of the bean; this may be of a very dark brickdust colour varying, according to the quality, to purple or yellow. Another contrivance of the small grower is that of bagging the cocoa at end of day, whilst still hot from exposure to sun, and so to sweat it dnring the night; this little scheme was learned from the Venezuelans, and is often practiced in Port-of-Spain by cocoa dealers to improve unfermented cocoa.

Next wo trace the system of the more pretentions planter who boasts of elaborate sweating and drying honses; their fermentation varies from five to eight days, the process, however, is carried on "without the least reference to the thermometer" in close chambers, and it is certain that in many cases they heat tho cocoa up to a stage at which alcoholic fermentation could not go on, say 160°. What follows then is destruction of the diastase and other ferments, and a lower type of fermentation or eremacausis (as in manure) the cocoa becoming eventually fusty and sour. The planter working on snch a scale should "break bulk," as the tobacco planters term it, when it reaches 140° or earlier.

Treat it as you may, however, fermentation at high temperatures cannot go on beyond eight days, for the reason that the fuel, *i.e.*, the Sugar, is all exhausted, if not the ferments, and although it may be possible to start it afresh by adding some invert and a little dried yeast, in the same way as tobacco curers often referment fusty tobacco, yet, most men will say "*cui bono.*" *At the best* it will contain a large proportion of unsatisfactory beans which on section will shew their inferiority, and, "nota bene," section is the test employed by all brokers now in examining samples of high class cocoa. At this stage of our inquiry it will be proper to consider the bearing of the state of the weather on fermentation as just described, a very important matter, where the cocoa has to be dried during persistent rains, and this very often happens when the crop comes in early. The small proprietor then is not so very unreasonable, according to his light, in making the formenting and drying process go hand in hand as it were, for the partially fermented cocoa stands damp weather and absence of sun longer than that which has been thoroughly treated. Unsweated cocoa, moreover, gives the same results on analysis as any other, and although it is not aromatic, and fetches a smaller price, the poor man argues that it is better than a dead loss. A much better remedy for these troubles will, however, be fouud further on.

It would be a mere waste of time to dwell longer upon the unsatisfactory short and unscientific method in common uso, so we will pass on to the plan introdnced by Mr. Strickland and for which he deserves full credit. His system has been adopted with varions modifications in both Grenada and Trinidad, but to understand its importance we must study the composition of tho bean first, and see how it is affected hy the fermenting process according to the different varioties.

Reviewing twelve separate analyses by such eminent anthorities as Professor Parkes, Hassall, Playfair and others, one is surprised to see that their estimation of fat or cocoa bntter shonld vary from 36 to 56 per cent. The late Professor McCarthy fonnd from 18 to 28 per cent. (from uncnred coooa probably). Is this a slur upon chemical science, or dces it not rather prove the wide diversity of our cocoas in respect to that partionlar constituent and, thereby, explain the different requirements with regard to fermentation? The average of these analyses is follows:—

Cocoa bntter	50
Albumenoid snbstances ...	20
Starch	13
Salts	4

Theobromine	2
Other substances (including in one observer humic acid 7)	11
Total ...	100

This relative composition of the different varieties of cocoa is maintained whether in the green state, fermented, or roasted. Are we not then justified in deciding that no chemical changes are brought about in the bean by fermentation, or at any rate none that can be formulated?

The ingredient ulmine or humic acid is a curious discovery, and one would fancy straight away that it was derived from Sugar! But that cannot be, for the starch granules within the bean are not changed into Sugar. Mr. Prestoe thought that the sweating of cocoa was a malting process (vide Annual Report of Botanic Gardens for 1880, para. 337), and many planters still think that germination has something to do with it; if so, it can be but in the very earliest stage, inasmuch as the radicle is always *in situ*: it may influence the swelling out of the bean which always takes place in the sweating house, and that is about all. When the vinous fermentation sets in, germination is arrested. At this stage, if fermentation has been properly established, the cotyledons are found separated and the vinous liquor of the pulp, which passes through the membranous covering, occupies this space, as well as the lacunæ between the convolutions, the cocoa bean being distinguished as *foliaceous*. This it is which has so marked a physiological influence and affects its flavour, the bean being, as may be said, *cuite dans son jus*.

This phenomenon is described chemically as "osmosis," and may be shown in a very simple manner by placing the fermenting beans in a solution of fuchshine, which passes inside at once.

When the cocoa is eventually dried—in the sun or otherwise—the fluid, of course, disappears, but the *lacunæ* remain, and are the cause of the elastic feeling on pressure which some buyers hold by so much. *It is the sign of fermented cocoa.* If the following axioms are admitted, viz.:—

1. The different requirements of our cocoa with regard to fermentation are mainly regulated by the amount of fat they contain.

2. It is not possible to separate the varieties in the field for practical purposes,

we may proceed to consider Mr. Strickland's method. He has a series of vats or tanks (3) in a row, built of concrete. They are 11 feet wide, 5 feet deep, and about 22 feet long, (the row of three); they are covered by a galvanised iron roof, but the shed is not boarded up from the level of the tanks to the roof (about 5 feet), there is a vent, of course, below for the escape of liquor, and the cocoa is covered carefully on top with plantain leaves; there is no other cover.

The drainage from these tanks runs away to a little pond and stinks quite as bad as the lees from a sugar battery. One cannot help thinking this is a foolish waste of good material, for if the pleasant tasting vinous liquor cannot be used as a beverage, why not convert it into vinegar?

The cocoa remains in the first vat five days, and the temperature is not allowed, under any circumstances, to rise beyond 115° or 120° (by thermometer); this is regulated by the admission of cold air through bamboo tubes, with many openings (5 bamboos in each tank), with their ends protruding through holes in the concrete wall at each end of the tank; the ends of the tubes are plugged with clay when required to modify the current of cold air—a rough and ready plan, but quite effectual. In this tank the evolution of carbonic acid gas is very marked, and may be easily demonstrated by connecting the ends of the bamboos with a glass filled with lime water. There is also a delicious odour from the fermenting mass, as of apples or cider. The vinous fermentation in this vat induced by "saccharomyces cerviciæ" (?) is accompanied before removal probably by a commencing lactous fermentation, the ferment of which is "penicillium glaucum,"

$$C_6 H_{12} O_6 = 2 O_3 H_6 O_3$$

The cocoa is next turned over to vat No. 2, and about this time a marked acid reaction is shewn by the reddening of litmus paper. The lactous fermentation may then go on alone at a somewhat lower temperature, and after another five days the cocoa is turned into vat No. 3. Here, some very complex changes take place, such as the conversion of lactic into butyric acid,

$$2 C_3 H_6 O_3 = C_4 H_8 O_2 + 2 C O_2 + 2 H_2$$

The pleasant cider-like smell of the vinous ether has vanished, and it is curious that it should be replaced by its isomer (Butyric Acid). The latter is familiar as the sour smelling substances met with in rancid butter. The presence of butyrates in this vat is very easily shewn. One must be careful that at this stage the temperature does not fall below 95°, and even then, some of the secondary fermentations must take place, (which some people think might be left out, for fear of spoiling the flavour of the bean) such as the mucous and putrefactive, with vibrio and the formation of nitrous and nitric acid, and at times the evolution of offensive gas, the beans becoming discoloured and covered with algæ. After five days in this vat the cocoa is removed to the drying house, where three days' exposure to the sun suffices to dry and finish its preparation. The cocoa has then decidedly not an inviting appearance, it is dark, somewhat shrivelled, not too elastic on pressure, and even sour smelling, but this sour smell is certainly not the *common sour smell* which is condemned in inferior cocoa. It is by section only that the advantage of this process can be seen, and then you will find a characteristic light cinnamon colour, an agreeable odour, and every bean *uniform*—not a purple or yellow bean, even amongst the flattest and most unpromising. This is what the manufacturers want, and it is the only way known at present to get over the difficulties of sweating the many varieties of our cocoas. It may, however, be suggested that the outward appearance of this cocoa is susceptible of improvement; and with this view washing might be tried, and the cocoa afterwards sprinkled with a solution of boric acid to prevent mildew. If treated with this or some similar *antiseptic* such as sulphurous acid (fuming sulphur) "as suggested by Mr. Prestoe," it might be dried in a current of air without any exposure to sun at all and would resist damp for many days, but if dried by artificial heat such as that of Mr. Ross of Grenada, (dry heat) or hot water apparatus, the risk would be still less. This plan would be applicable to all cocoas, of course, without respect to the period of fermentation, and in wet weather it would be found a very great advantage to remove the mass of *sour gummy substance*, although this may act as a preservative coating when the cocoa is sun-dried. The husk is certainly much more brittle in washed cocoa, and does not therefore protect the bean as it should; it weighs also considerably lighter, but this might be made up by *re-coating* the bean with a mixture of starch, gum tragacanth, and boric acid. This would be preservative, and improve the look of the cocoa very much; colour might be added if desired. If so, it should be *red earth* and not common colouring material, because earth coating is recognised as legitimate. Some might prefer the fresh cocoa pulp; if so, boric acid should still be an ingredient, and the proper way would be to sprinkle during the drying process, and not wash on in quantity. One favourable point in the removal of the fusty products of fermentation before drying would be the saving of infinite *labour* in treating and hand rubbing the cocoa as usually practised. The boric acid might be added in the proportion of 1 per cent.

"REM ACU TETIGISTI."

SECOND PRIZE ESSAY.

* * * * *

After picking the pods are gathered into heaps, this heaping being a first step in the process, and one requiring special attention.

The time fermentation in the pod is allowed to take place varies according to the state of the weather, for

instance, during warm and sunny days from twelve to thirty-six hours, but during the rainy season or other showery days when the development of fermentation in the pod is slow, the duration may extend to as much as six or seven days; the exercise of some judgment is required here so as to give the operator a fair start to enable him ultimately to achieve success. The next is heaping, being easier to hand for the breaking process, the pod is taken in the left hand and split on both sides longitudinally and opened in a somewhat similar manner to the shell of an oyster; the gelatinous contents are then scooped out and thrown upon plantain or fig leaves, which must be closely spread upon the ground, previously, for the purpose of placing the pulpy mass thereon. In case of rain meanwhile, an impromptu covering of leaves forms an ample protection from wet, which, if not prevented as much as possible at this stage, will result in rotting within a very short period of time.

The principal method of transport of the green cocoa from the fields to the fermenting cells is in baskets (expressly manufactured for the purpose), carried upon the backs of donkeys. Before entering into further details of the processes of the fermentation of cocoa, I shall describe the manner in which a fermenting house should be built; an oblong square framework of any size as may be required and of about ten feet high, roofed over with galvanized tiles, the sides of which should be concreted up not higher than three feet, four inches, sectioned off into three equal compartments; a size of eight feet, six inches by four feet, six inches each cell will be found very handy for working purposes; about six holes each side of, say, three inches diameter should be pierced through each compartment, the lowest three being placed about six inches above the floor, while the upper ones should be placed about eighteen inches up and equally distant from the ends of the compartment (to secure uniformity of ventilation when required). Through and through the holes, should be fixed in bamboos, which have been previously bored around and about at three inches apart with ⅝ths of an inch auger holes. The floor should be double, a lower one being made of concrete, four inches space left, and then an upper one made of creole wood pierced with auger holes forming three-inch squares throughout; both floors being dished in from the sides to the centre at an angle of about thirty degrees: holes being left through the partition and end walls in the bottom centre to allow the watery matter thrown off by the fermenting cocoa to escape. The tops of the fermenting cells should be provided with tight wooden covers hermetically fitted and the framework above left open.

To prevent acidity in the cocoa, which is often caused by the chill resulting from its contact with the cold sides of the concrete cells, I recommend that short lengths of board be fitted in on every side, the horizontal holes being cut through so as to allow the free passage of the perforated tubes beforementioned. Well, our fermenting (or sweating house, as it is sometimes called) being finished, we proceed to fix in our perforated tubes, which are then well plugged at each end with wooden or clay plugs, to prevent during fermentation an inrush of atmospheric air exceeding the regulated amount required; the lower escape holes are also closed and then cell No. 1 is filled up nearly to the top with green cocoa.

Covering over the mass with plantain or fig leaves aids slightly in hastening the process of fermentation, but this is not an absolute necessity if the wooden covers are well and closely fitted on and covered over with a tarpaulin held in its place by any loose pieces of wood at hand. At the end of four and twenty hours during warm weather and somewhat longer during wet weather, one of the upper and another of the lower ventilating tubes should be unplugged to prevent a sudden chill, another of the causes of sourness in cocoa; the unplugging should be done on the side away from the direction in which the wind happens to be blowing at the time, both to allow the escape of carbonic acid gas and also the introduction of a thermometer so as thereby to be enabled to regulate the mean temperature of the fermenting cocoa which should not exceed 110 degrees Fahrenheit. At the end of seventy-two hours all liquid is let off from one of the plug holes at bottom, the covers being unshifted, the operation of an interchange of cells takes place.

Two or more experienced hands armed with wooden scoop shovels get inside on top of the now steaming cocoa and partly by trampling and rubbing with hands, feet and shovels, the whole mass is rubbed together and disintegrated, shovelled up and over into cell No. 2, which had been previously prepared to receive it. No. 1 being properly cleaned and refilled with green cocoa, the same precautionary measures, now as before, being strictly adhered to, the fermentation continues; in cell No. 2 the temperature may be allowed to rise as high as 118 degrees Fahrenheit, but should not exceed this as otherwise an excess of heat may stew, or ultimately result in shrivelling up a large number of the beans; this can always be avoided by a uniformity of regulation in the mean temperature of the fermenting cells.

After the cocoa taken from cell No. 1 remains in cell No. 2 for another seventy-two hours, this cell is then opened and here the handling and management of the scoop is of prime importance, every portion, every grain of the cocoa must be turned over and over, while being also handled to sort, or separate such as may yet be sticking together during its transference over into cell No. 3, No. 2 is cleaned and well ventilated, where into the contents of No. 1 is transferred, and No. 1, after being also cleaned and aired, is filled up again with green cocoa and so on to the finishing of the picking on hand. After the expiration of a further ninety-six hours or about ten days in all (being sufficient to complete the process of fermentation), and also to render complete the metamorphosis of suppressed germination, the cocoa is now ready, the weather being favourable for transference to the curing house.

Permitting cocoa to remain so long as from fifteen to twenty days undergoing the process of fermentation, especially during the latter stage, is merely making a choice between fermenting a few days longer and drying a few days less and *vice versâ*.

The above variety of processes to be carried out as they are here laid down requires a nearly continuous succession of sunshiny days, for according to atmospheric changes from warm and dry, to moist or wet, so has also the fermentation of the various qualities of cocoa to be regulated; so that an extension of the fermentation process to nearly three weeks is justifiable only during the rainy season, or otherwise during a continuous succession of rainy days, but great care and experience are required to prevent the cocoa from being rendered sour, mildewed or irretrievably rotten.

The above processes of fermentation of cocoa, as followed out in the Island of Trinidad in some instances and adapted to the Criolo and all other qualities indigenous to our soils (with slight variation) to the thin-skinned red and yellow kinds, the duration of fermentation, when such is found necessary to be done apart from the thick-skinned red and yellow kinds also, should be shortened by at least six hours at each stage; but here again we have to depend much upon atmospheric conditions besides a mixed cocoa cultivation.

Cocoa prepared as above, when sectioned, will be found to have developed a rich cinnamon colour, the grains will be mealy, plump and fair to look upon, the smell pleasant, while not a vestige of mildew nor sourness will be present.

The advantage of washing cocoa in Trinidad is a matter of opinion; this question lies principally within the domain of the experimentalist; opinions are divided as to its local adoption; much general gain would result in case experiments in this line should prove commercially successful for the improvement of the quality of cocoa grown here; but to have a cocoa-house filled with washed and wet cocoa, and then to be hemmed in by a succession of rainy days extending over weeks together, the consequences following therefrom can better be imagined than described. Washing does not recommend itself either at any one

of the stages of fermentation, as the chill then caused may rather be productive of harm than good.

Colouring or painting over the bean with pigments should not be countenanced for one moment, as resorting to such measures is both retrogressive and deceptive; retrogressive because it prevents an expansion of experimental ideas to seek out the means whereby to develop natural first-class colours, and deceptive because when the subterfuge is most depended upon it will of necessity fail signally. The production of the first-rate article can and must be realized,—that which the frequenters of Shove's and others so well love to base quotations upon in the markets of England, Europe and America, there realizing paying prices and here returning a harvest of gold to the thoughtful and industrious, whereas on the other hand subterfuges are sure to be found out in the long run, and but bring in train disappointment to individuals and ultimate loss to entire communities.

In conclusion, having in the course of this essay touched upon all the principal circumstances connected with the fermentation of cocoa, a brief summary of the means whereby a first-class marketable article can be turned out will not be out of place. They are as follows:—

(1st.) Warm sun-shiny days.

(2nd.) Great attention to the cleanliness and proper airing of the cells. (Fermenting tanks.—ED.)

(3rd.) A proper and uniform regulation of the mean temperature of the cells during fermentation.

(4th.) The fermenting cocoa should never be allowed to remain in its lees.

(5th.) The handling, interchange of cells and sorting process being deftly done and the curing being gradually and regularly proceeded with during the first forty-eight hours, these taken in the aggregate may be accepted as the *summum bonum* of the fermentation of various qualities of cocoa and also the turning out of a first-class staple.

To produce aromatic and well-developed beans in the cocoa pod is the *ultima thule* earnestly aimed at by our really pushing and enterprising planters.

SOL.

THIRD PRIZE ESSAY.

When we ask ourselves the question, "How to ferment Cocoa," we set ourselves the task of resolving a problem that presents a multiplicity of side issues, each bearing directly on the main question, and each vital to it. It would be erroneous, indeed, to start with the cocoa already broken and boxed in the sweating compartments, for a uniform fermentation, and that it is we aim at, necessarily depends on the uniformity of the fermentable matters. The first step, therefore, must be a proper selection in the field, and a judicious classing of the cocoa we intend fermenting. The best criterion for this selection, the surest principle for this classification, is undoubtedly the degree of maturity of the cocoa. As cocoa ripens its saccharine parts increase proportionately to its maturity, and since, as we will further on demonstrate, this saccharine principle plays a most important part in the fermentation process, it is but logical to set up as a basis for our selection the amount of contained saccharine matter; in other words, the amount of maturity. And this selection is of vital importance; for the less mature cocoa, less rich also in saccharine, will ferment much slower than the riper beans, and if these two be "sweated," as the term goes, together, we will find the latter oversweated when the former has but just reached the proper point.

Having therefore properly classified our cocoa, according to its degree of maturity, our next step is to place it in sweating boxes where it can ferment. We now come to the question: "What kind of boxes will best ensure the result we are aiming at;" viz., a uniform fermentation.

The fermentation of cocoa is essentially alcoholic; the sugar of the pulp becoming converted into alcohol and carbonic acid; so that, as Lavoisier says: "If we could re-combine alcohol and carbonic acid gas, we would reconstruct Levulose," (fruit sugar.)

Now, basing our arguments on the firmly established dictum of Pasteur "that alcoholic fermentation is the function of the life of certain cellular vegetable organisms, Zymogenic Mycrophytes, which are *a priori* the leaven, and the production of alcohol is simply the result of the absorption, at the expense of the sugar, of the oxygen necessary for their vitality," we feel no hesitation in laying down this rule for the disposition of the sweating boxes. These boxes should be not more than fifteen inches high, and the cocoa in them should be uniformly laid. This maximum of height will obviate the mutual pressure of the beans, preventing the amount of atmospheric circulation required for conveying, to the mass, the organisms on which fermentation depends; and it would, besides, economize the labour now utilized in transfering the cocoa from one box to the other, to ensure the contact of the lowest beans with that air, which they would never receive in the sweating compartment of the depth in vogue.

A point, which will fitly find its place in the present paragraph, refers to cocoa which though mature has been weathered or rained on in the field. Part of its saccharine principle has been washed away, and being now, but a poor medium for the development of the microphytes, it is apt to "postpone" a great deal, often undergoes putrid changes, and becomes fit only for the manure heap. Under-matured cocoa, from a similar cause, a deficiency of levulose is also retarded. A great deal of cocoa was lost last November and December, especially among the smaller proprietors who ignore the remedy requisite to save the cocoa. And this remedy is so simple that I am indeed surprised it has not been more generally employed by cocoa planters. It is rational enough to suppose that if we can replace the deficient material, levulose, we will ensure a healthy and uninterrupted fermentation. The best substitute is sugar, and that of the commonest kind, that is to say, sugar containing the most glucose. Cocoa treated in this way and raised to the same composition as matured cocoa will ferment as readily, as quickly, and as thoroughly as the latter.

During the process of fermentation a great amount of heat is generated, and this acting on the bean both through the pores of the pellicule and through the opening at the top, known as the "Hile," vaporizes the aqueous elements and develops the fatty substance which absorbs and retains the essential aroma of the cocoa. Still the heat generated is not sufficient to vaporize all the aqueous portion of cocoa, and it is in our drying houses that the residual moisture is finally expelled. For this reason, thoroughly fermented cocoa, containing a minimum quantity of moisture, must be dried gradually so as not to blister the bean, especially if the remaining pulp or "bava" has been washed off as is done in Ceylon. On the other hand, cocoa indifferently fermented, or surrounded by an undue proportion of moist bava, is very liable to be attacked by fungi, and to mildew, if, as is often the case, heavy rains retard the drying process. The repeated hand and foot rubbing, practised to remove the mildew, often breaks the bean; and the fungi spread to the interior of the cocoa, which, if not rendered altogether unmarketable, is, at all events, much depreciated in value. No artificial means of drying cocoa has yet given satisfactory results; but in rainy weather the following process has been found to minimize the risks of mildew. It consists in heating pulverized red earth, and mixing it intimately with the cocoa. This pulverized earth acts both by absorbing the moisture from the cocoa and by vaporizing that moisture. By taking advantage of a sunny day the cocoa may be freed from its earthy coating by slight washing and immediate drying.

But before concluding, one point is deserving of notice in this matter of cocoa fermentation. It is the specific wants of the various markets. Nothing is better known to the cocoa planter, when his cocoa is sold abroad, than the fact that, however scientific the preparation of his cocoa, by fermentation, the special wants of a particular market, may require an imperfectly fermented cocoa with certain external characteristics rather than a perfectly fermented cocoa

But this feature is not gaining ground from the obvious superiority of the perfect over the imperfect cocoa. QUOD SCIAM.

ESSAY BY "TALISMAN."

* * * * * *

Various qualities of cocoa are grown promiscuously in cocoa plantations, therefore they have to be picked and fermented altogether. There is no remedy for this evil except where a new cocoa estate is to be formed, when the planter can choose the best quality of cocoa to plant, known as the Creole Cocoa and almost universally grown in Venezuela.

2. Fermentation process.—Begin picking cocoa, say on a Monday, and continue picking up to Friday, each day heaping up the cocoa pods so as to cause a certain amount of fermentation; on the Saturday cut open the cocoa pods and put the beans in large sweating boxes covered up well. On the following Saturday take the cocoa from the boxes and place it in the drying houses, clean and open it out, then immediately before the gum of the cocoa gets dry sprinkle on fine sifted red earth and hand-rub occasionally until the cocoa is dry, then it can be sacked ready for shipment, but care must be taken not to bag it before the cocoa is perfectly cool. This is the process adopted on the *San Antonio* estate which realizes the first market price.

3. Another process.—Ferment the cocoa as described in paragraph 2 for three days, then take it out of the boxes, stir thoroughly, and put it back covered up well, giving it further fermentation for three days; then take it from the boxes and open it out in the drying houses, rub it occasionally until dry, but do not sprinkle on any red earth as mentioned in paragraph 2. This second process is commonly carried out on all the large estates, and obtains the second best price in the London markets.

4. Another process.—Pick the cocoa and ferment it in boxes or simply cover it up in a large heap for four days and open it out for drying; hand-rub each morning, then sack it. This mode is practised by the small cocoa proprietors.

5. Another process.—Each day you pick; in the evening open the pods and take the beans to the sweating house, cover up well, adding each subsequent day's picking to the first. Do this for three days successively, every evening mixing up the cocoa and covering up well. On the morning of the fourth day put the cocoa in the drying-house; clean and rub. In the evening gather up the cocoa in a large heap, then cover it so as to exclude air. Continue this process alternately drying and fermenting for three days and nights—that is, three days' drying and three nights' sweating. On the morning of the fourth day take about forty pods of cocoa and open out in about three buckets of water, wash out all the juice and take that water and throw over the cocoa in the drying-house, slice up the pods and put them to soak in water. On the fifth morning after the cocoa has had another nights's sweating, open out for drying, skim off the gum from the pods that were put to soak, take the gum, apply to the cocoa and rub well; but before the gum is dry sprinkle on sifted red earth or red ochre and hand-rub occasionally until the cocoa is dry. On the morning of the sixth day get some good quality of butter, wash out all the salt thoroughly and rub the cocoa with it. About three cents worth of butter is sufficient to each bag; the butter will give the cocoa an agreeable perfume without destroying the chocolate aroma, and will prevent mildew, one of the greatest enemies that cocoa planters and shippers have to contend against.

6. To generate fermentation in hard, green, unfermented cocoa, take about three to five bags according to the quantity in hand, wash and dry it; get about forty pods of cocoa and follow the process explained in paragraph five, but with this difference: put the cocoa in a sweating box, saturate with cocoa juice and cover up well to cause formentation. The next morning repeat the process, mix up the cocoa and again cover to cause fermentation. In the morning of the fourth day put it out to dry and continue the process explained in paragraph five in regard to alternate drying and sweating, adding in this case a very small quantity of good molasses to the cocoa gum skimmed from the cocoa pods by process described in paragraph five.

7. Artificial Process by Steaming.—Take the beans of the cocoa fresh from the field with the pulp on and put them into large coppers, first taking care to line the interiors of the coppers with plaintain leaves in order that the cocoa should not touch the metal; throw in one or two buckets of juice from the pulp of the cocoa with a little water as described in paragraph five. To generate steam add a few bay leaves, if at hand, cover the cocoa to exclude air and put fire under the coppers, heating slowly and examining the cocoa now and then to see that the fire is not too hot and cracking the shells of the beans. At the expiration of from two to three hours it will be found that the cocoa beans have become round and full, with a good red colour externally. Withdraw the fire and cool down, then put into the drying-house, employing the alternate drying and fermenting process explained in paragraph 5. This artificial steaming and fermenting is certainly the most expeditious, taking a few hours only, instead of days, and it can be accomplished with a few cheap appliances, and the fire can be connected without much ingenuity to a drying apparatus if required in wet weather.

APPENDIX.

(*A.*) Properly fermented cocoa by the processes described in paragraphs 2, 3 and 5 has a sweet chocolate state, nice aroma and a pretty cinnamon colour when the bean is broken. It has more fatty matter than inferior cocoa.

(*B.*) If planters were to apply to our well-known and energetic Botanist, Mr. J. H. Hart, I am certain that they would get assistance from him by advice as to the best quality of cocoa to be planted, and in a few years the new plantations would yield the best quality of cocoa, and fermentation would become easier.

(*C.*) The mode of fermenting cocoa as described in paragraph 5 is from my experience the best way of curing cocoa, the alternate drying and sweating causing every bean to be of the same quality, the interior having a fine cinnamon colour with an aromatic smell, and the exterior an uniform red colour and is heavier than when fermented by the other processes.

(*D.*) As an example that the renovated cocoa may take a price equal to good fermented cocoa, I may mention that in the year 1881 I shipped fifteen bags of cocoa of the same estate brand for trial—five of the process described in paragraph 3 and five of that described in paragraph 4, and also five of the renovated cocoa described in paragraph 6, putting a private mark on each lot of five bags and writing to ask my agent in London to sell them separately. I was astonished to find that the renovated cocoa realized the highest price, viz: 80 shillings per cwt., the other two processes realizing one or two shillings less.

(*E.*) The application of butter to cocoa for the prevention of mildew as described in paragraph 5 may excite the risibility of some persons, but I have tested it well; and cocoa that has had butter judiciously rubbed on can be shipped without fear of mildew to any cold or damp climate. The milk of the cow must have some latent virtues antagonistic to the little germs or microbes which infest damp cocoa. This mildew is called grey cocoa in the London markets, and is rated at the lowest price.

(*F.*) One of the evils prevalent on cocoa plantations is the picking of unripe cocoa; the beans are hard, flat and green and cannot be properly fermented. If these beans are not carefully separated from the good, as is done on the *San Antonio* estate, there is a certainty of deterioration in the market value. The cheapest method is to separate the unripe fruits from the ripe in the field; heap and cover the unripe fruit whilst in the pod and break open after eight days; bag and sell to the chocolate manufacturers in the island. Cocoa planters are generally penny wise and pound foolish in engaging inexperienced men at low rates of wages to pick cocoa. These undisciplined hands not only pick a great quantity of unripe cocoa, but do a great deal of damage to the cocoa trees.

Ten experienced men will do as much work per diem (without doing the damage as described) as fifteen inexperienced labourers.

(*G.*) An evil that ought to be remedied by Government is the clause in the Cocoa Ordinance which prevents the cocoa dealers from buying less than ten pounds of cocoa. This prohibition induces the small holders of cocoa (when they have not got the sufficient legal quantity of cocoa of their own to sell) to raid on their neighbours' cocoa for the purpose of making up the required 10 lb.; and whilst engaged in these nocturnal excursions it is only natural to suppose that they should make a great addition to the 10 lb. at their neighbours' expense. This pilfered cocoa is generally sold green and unfermented to the shopkeepers or dealers in the country. The planters who heap up the pods in the fields as stated in paragraphs 2 and 3 suffer greatly from these thieves, but by taking in the cocoa every evening as mentioned in paragraph 5, the robbers have less chance of stealing; and this is another reason, and a paying one, that the mode prescribed in paragraph 5 is the best way to ferment cocoa.

(*H.*) A good sugar planter knows well that to make good sugar and to get a good return in the boiling-house, he must commence operations in the cane-piece from the first agricultural stage. So it ought to be with a good cocoa planter. The first care should be to cultivate the cocoa trees in a manner that would make them bear healthy fruit abundantly. The result of this would be a large return of cocoa yielding well and the process of fermentation made easy.

(*I.*) There are small stinging ants which build an earthly nest round stems of the young cocoa pods, and there are large black ants that nip the young pods; these depredators destroy at least three-fourths of the cocoa crops, and the pods all turn black on the trees. There are many of the pods injured by the ants which are unhealthy when they arrive at maturity, making fermentation difficult. A little white lime sprinkled round the roots of the trees will make these destructive little insects migrate to more congenial quarters.

(*J.*) It would be a boon to the Colony if His Excellency the Governor, who has hitherto been the great promoter of the major and minor industries, would unite with the Chamber of Commerce and endeavour to prevail upon the English Government to reduce the duty on chocolate from 2d. to 1d. per pound, thus equalizing it with the raw material. Capitalists would then be induced to invest in chocolate manufactories, and I may venture to say that unfermented cocoa would never be purchased by them which in a great measure would compel the small planters to ferment their cocoa properly. The Botanist, Mr. Cruger, and many others who followed after him in trying to establish chocolate factories in Trinidad failed, as the extra duty on chocolate imposed on arrival in England did not allow them to compete with the Home factories, and our chocolate industry consequently has had to succumb to the adulterated chocolate made in England, some of which is actually imported here where the cocoa trees flourish and where the manufacturing of chocolate ought to be one of the major industries.

TALISMAN.

[The prize essays are published by direction of His Excellency the President of the Central Agricultural Board. The essay of "Talisman" is added because in our opinion it is of interest, as illustrating the "old and time-honoured" system of procedure.

They cannot be taken as they now stand for the purpose of comparison "as prize essays," because in the case of the second essay certain portions have been excised as not bearing directly on the subject of fermentation, and being unsuitable for publication in this journal.

In the second essay the statement "that fermentation begins in the pod" is in our opinion erroneous (the same thing is stated by "Talisman"); possibly the author meant to say *a certain degree of softening*, or losing of tissue rather than fermentation (?) We all know that the juice of the grape does not ferment unless the skin is pricked, and in the same way with the contents of a cocoa pod, it must be *broken* before atmospheric air can gain access to it and fermentation take place.

Mr. Hart, as judge of the competitive essays at the San Fernando Exhibition, has promised a Notice in the next issue, and he will probably touch on some interesting points in the unsuccessful essays at the same time.—EDITOR.]

THE COCOA PRIZE ESSAYS.

At the meeting of the Trinidad Central Agricultural Board,

Mr. Hart announced that the essays on the fermentation of cocoa had been opened, and that the first prize was awarded to Dr. J. F. Chittenden—(His Excellency): I guessed you would have got it—(applause)—The second prize had been awarded to Joseph Augustus Crichlow, of Arima. The third prize had been awarded to Mr. Eugêne Lange (senior). His Excellency had been kind enough to add second and third prizes to the prize of $25 originally offered. There were nine essays received, and one was disqualified by coming in too late. With the consent of the authors the successful essays would be published in the *Agricultural Record.*

Mr. Adrien de Verteuil gave notice of the following motion: "That, with the object of meeting the difficulties which too often arise from continuous rainy weather, it is advisable to adopt some process for drying cocoa by hot air, or any other artificial means, and to appoint a Committee who will inquire and report on the best method to be recommended."

DRYING COCOA BY HOT AIR.

Waltham, St. Mark's, Grenada,

March, 1890.

DEAR SIR,—In reply to your letter asking me for some information of the working of my cocoa-drying house, I have pleasure in enclosing a rough plan, by which you will see that the idea is most simple, but it answers its purpose splendidly. The pipes are of iron, and are one foot in diameter and half an inch in thickness. The drawers, or trays, are 7 feet by 2½ feet, the bottoms of which are of thick wire netting. The oven, which is placed outside the house with a shed over it to keep off the rain and to store fuel, should I think be built of bricks.

In my house I can thoroughly dry cocoa straight from the sweater in 48 hours.

Col. Duncan had an American fruit-dryer, but it was found useless for drying cocoa.

I may mention that I was the first in this Island who dried cocoa by hot air, and now many of the planters here are erecting similar houses.

I hope you will be able to understand the plan of the house. I am *not* good at draughting.

Yours, &c.,

CHARLES H. A. ROSS.

To Dr. Chittenden,
Secretary, Central Agricultural Board.

[The plan Mr. Ross has been kind enough to send is hardly suitable for the purpose of a lithograph, but it can be seen by any interested in the subject, on application.—EDITOR.]

THE GREEN ONYX which is being quarried in the west of Grant County, New Mexico, is found in a fissure vein about 50 feet wide and over a mile in length. The stone is becoming fashionable in the United States for interior decoration. It shows a variety of colours—green, white, pink, and salmon—is both stripped and mottled, and susceptible of a high polish, while it is the only kind of onyx which can be carved like marble. Blocks of it have been offered by the proprietor of the mines for use in the construction of the exhibition buildings of the World's Fair.—*Globe.*

THE NEW WATCH COMPASS.

(*Communicated.*)

A paragraph is going the round of the home papers to the effect that the watch in anyone's pocket may serve to indi ate the points of the compass, at any hour of the day. It was pointed out by a Yankee, that you have only to direct the hour-hand of a going watch to the sun, and midway between such hour and XII will be due *south*. For instance, the hour-hand at IV o'clock directed to the sun, II will mark south. This is new to me, and seems to be taking the world by surprise—even Stanley, the explorer and American, never having heard of it.

Pending the arrival of an "authoritative" explanation, I submit the following:—The earth's surface presents everywhere, to us diminutive crawlers upon it, an "offing," as at sea—that is, a perfectly circular patch of a few miles in diameter. This patch of surface, however, is the same, for all celestial phenomena, as if it were the plain parallel to it of the full diameter through the earth's centre. Neglecting this fact, and the variation in the sun's north and south declination, we arrive at the approximate rule that 'the sun rises in the East and sets in the West,' occupying at the equinoxes twelve hours, from VI to VI, in doing so. But whether the days are short or long, the sun is *always* due *south* at XII o'clock. This is true for all countries north of the Mediterranean, but not always the case in Ceylon, where in June, at XII noon, the sun is due *north*; but this *en passant*.

Now if you will imagine this "offing,"—which as the same on land as at sea (only the hills, houses and trees prevent our noticing it),—to be divided round its southern semi-circumference (*i.e.*, the southern horizon from E. to W.) into 12 equal parts, (as a watch whose face is marked for 24 hours is divided) the reason of the rule becomes sufficient obvious,—bearing in mind that the watch in your hand *however much you move it, or walk about with it, is practically, and actually as on a pivot, in the very centre of your "offing."* At VI the hour-hand points to the rising sun, XII is due west, and IX must necessarily be due south. As the sun advances in his course, the hour-hand—of a watch marked for 24 hours—would follow him, hour by hour (XII. always being south); but as the corresponding semi-circumferance of the ordinary watch is divided into 6 hours only, one hour of the watch covers two hours of the sun. *Hence the result* that, by keeping the hour-hand to the sun, the "XI" of an ordinary watch moves east at precisely the same rate as the hour hand moves west, till they meet at noon, both there indicating due *astronomical* south. They then pass on, receding from each other as they had advanced, midway between them *necessarily being* at any instant of time due south.—Q. E. D.

The true compass indicates the magnetic north, while the watch can only indicate the cardinal points astronomically and approximately. Bearing this in mind, it is a pretty use to which to put our watches, and may not unfrequently be found useful.

Astro.

COFFEE PEST.

In the correspondence on the above subject, which we publish in another column, it is rather amusing to find Miss Ormerod referring Mr. Thomas Dickson to such well-known local authorities on coffee pests as Nietner, Morris and Green. Miss Ormerod, although one of the greatest living authorities on insect pests, admits that fungi are out of her line. Had Mr. Dickson consulted Mr. D. Morris, that gentleman would have affirmed, and with truth, that he *had* discovered a remedy for *Hemeileia vastatrix* in sulphurous acid, the product of a mixture of lime and sulphur, applied to the coffee bushes, in dewy or drizzly weather. This acid proved fatal to all the fungi it reached; and not only bushes but whole estates were cleared of the pest. But all in vain while millions of spores existed all around and were ready to enter the stomata and suck the life-blood of every fresh coat of foliage put on by the unhappy trees. It was found that unless the whole of the coffee in Ceylon could be simultaneously relieved by the entire destruction of every spore of the deadly fungus, there was no use in fighting a losing battle. The general principle, too, that the best way of fighting a plant pest is to strengthen the plant by means of manure, failed in this case, because it was found that manuring merely provided food, in the shape of rootlets, for white grubs underground, as well as for the fungus aboveground in the shape of fresh leaves. Finally, as if to lead the unhappy coffee planter to take up the patriarch's cry, "All these things are against me," green bug made its appearance, attacking the juices of the coffee bush with a virulence far exceeding that of the old pest, the brown or black bug. Phenyle, which Miss Omerod recommends, is not a new remedy in Ceylon, although we do not recollect hearing of it as an application to the roots of the bushes. Those who have coffee still yielding any crop might try this radical application. There is true philosophy in Miss Ormerod's recommendation that any mixture applied for the destruction of green bug should be of a viscid nature so as to adhere until not only the parent scale insects were killed, but the thousands of their progeny hidden beneath them were smothered. All kinds of spraying applications have been tried in the United States, including fine sand. The danger in all such cases, as Miss Ormerod points out, is, that what destroys the pest may fatally injure the plant by entirely destroying its foliage and harming the bark. Those interested ought certainly to purchase and study the new edition of Miss Ormerod's valuable book. They will there find directions for preparing and applying the mixtures most likely to prove effectual in ridding coffee bushes and fruit trees of insect pests. We are rather surprised that Mr. Dickson's correspondent did not say anything of insects which are the natural enemies of scale bugs and prey upon them. We observe from our exchanges that such insects are being introduced and largely bred in California, and it is stated with good effect in ridding orange, peach and other trees of scale insects. It is possible, though hardly probable, that the coffee fungus may, with effluxion of time, disappear from Ceylon, and coffee be again amongst our staple and profitable cultures. Let us cherish the hope, while we cultivate our new staple, tea.

Making Farming Profitable.—Now, in order that farming may be profitable, we must make the consumption of a cheap food produce a thing that will sell for a high price. Wheat, barely, oats, are costly food; on the contrary, barn, clover-hay, linseed, and cottonseed, are cheap foods. It pays, therefore, to sell grain and buy these cheap foods. Manufacture only answers on the condition of buying raw materials cheap, which we subsequently convert into articles of high value. Farmers, like manufacturers, must buy cheap and sell dear. Part of the food the beast eats is converted into heat. The animal heat must be kept up at any cost in every part of the body, else it will lose weight. The system must be maintained at 98 deg. Fahr. The production of milk is in a great measure determined by the quality of the food. The best food, in my opinion, is clover-hay and mixed grasses, clover is good; you cannot sow too much of it. Bran is another good food. Bran contains phosphates and other elements entering into the formation of the bones and muscles. Cottonseed, in the form of cake or meal, is a good food for milk making. It contains an excess of albuminoids, and is one of the best things to mix with straw, hay, ensilage, &c.—*Facts and Conjectures.*

COORG AND ITS COFFEE.

(*From a Correspondent.*)

The Commissioner of Coorg, in a recent Statement of the past season's crop of plantation coffee, showed that 1,746 tons were exported from the district, via the West Coast, against 1,098 tons—and 700 tons Eastward, against 596 tons—in 1888-89, making a total of 2,446 tons against 1,684 tons in 1888-89. The returns are prepared from data furnished by the various curing firms through whose hands the produce passes. The Commissioner also gives the quantities passing through the toll gates where accounts are kept. The figures for the past season are 3,353 tons against 2,760 tons in 1888-89. These quantities are understood to represent all the coffee that leaves the province, native grown as well as plantation; but in connection with them the Commissioner remarks that "no dependence can be placed upon the toll gate returns as showing accurately all the coffee which passes out of the province," making allowance for quantities exported through channels not included in Colonel Clarke's returns the following will probably be found a close approximation to the actual exports for the past season:—

Plantation Coffee	tons	2,700
Native Coffee	„	1,500
Total Crop of the season ...	tons	4,200

A forecast of the crop in the early part of the season had been made by the Commissioner from figures supplied by the principal owners of estates. The estimate was 6,715 tons, so the shortfall is quite 2,500 tons. The forecast was framed no doubt on the belief that the crop would be a good one, judging from what the blossom promised; and a good crop was due, for the previous season's had been miserably small. Some time before it ripened, however, the planters had made up their minds for figures much below estimates, and in most cases disappointment increased with the gathering of the crop. It is seldom too such small yields have followed each other; not only so, but it is feared the one about to be picked will be little better than the last, making three small crops in succession, a thing almost unknown in the annals of Coorg coffee planting. The same remarks, however, apply to the neighbouring districts of Mysore. The question now is, is this simply the result of unfavourable seasons, or does it indicate a more serious condition of affairs, actual deterioration and impaired fertility in the plant? There are pessimists who take the latter view, and who point to the poor returns which young estates give, even in good seasons, in these days compared with what the same sort of places gave in former times. They point to properties on the ghauts which, in spite of all that was done for them, went steadily, rapidly, and irretrievably to the bad. Open new land in the ghaut and you cannot make it yield as the old land did. Travancore, North and South Wynaad, they say, have had a shorter life, only because shade in Coorg and the Mysore districts have helped to baffle for a while that fell destroyer, leaf disease. But every plant and sapling has felt its fatal touch. Its germs have entered the sap, and the deep green and glossy leaf, with sturdy stem and lithe branch, must ere long wither and die under the baneful blight. This is certainly a gloomy picture, begotten perhaps of a despondent and morbid state of mind. Still it is so sufficiently true to nature that it would be foolish not to keep it in view, although the more hopeful need not allow themselves to be too seriously impressed by it. It cannot, of course, be gainsaid that he is surrounded by evidences of the extensive and destructive effects of leaf disease, for it has caused all but the total extinction of coffee in Ceylon, while in Java, which showed a yield second only to Brazil some years ago, things are little better. Travancore and Wynaad have gone the same way. Those who take a hopeful view point to the healthful appearance of estates that are properly cultivated and attribute the short yields of late years solely to unpropitious seasons. As to shortage of yield on young estates they say that the land, where such is the case, is only second class, all the best land having been taken up years ago. To what extent shade will neutralise the effect of leaf disease time alone will show whether it will save it entirely, or only delay the fatal period. A year or two will probably show whether the pessimist or optimist is right, and the next crop or two will doubtless be watched with nervous anxiety. There is, of course, in Coorg a good deal of coffee which may now be considered old, having been planted 25 to 30 years ago—at these ages it is considered that the plant has passed its prime and its yielding powers begin to fail; and there is no doubt this is only too evident on several estates.

The failure of the old Munzerabad plant or "chick" was fraught with useful lessons. It was understood to have originated from seed brought by the Arabs from Arabia and planted in the Bababoodin Hills. It had always been grown under the original forest shade and it produced a berry second only in quality to Mocha itself. But 15 or 20 years ago a general failing of its fertile powers became apparent. Crop in any quantity was only obtained once in two years, and it was difficult to get seedlings when planted as supplies to come on at all. It became worse and worse, but meantime some planter—was it Mr. Jupp of Igoor?—happened to bring some Coorg seed from Mercara, where he had been on a visit. He tried it on land he had several times planted up with local supplies unsuccessfully. The result was most satisfactory. It was found that the Coorg sprang up and flourished as if on fresh virgin soil, producing a plant much more vigorous and fertile than the old Munzerabad. Some time, however, elapsed before its superiority became generally known, and longer before the fact was generally admitted. But it was only a matter of time. At length nothing was planted but "Coorgs." The old plant seemed quite used up, its bearing power becoming less and less though this might appear all the greater by contrast with the heavy yield of the Coorg tree. It had not suffered much if at all from leaf disease, being always well protected by shade, and it would hardly be said that the soil on which it drew was exhausted. The heavy deposits of leaf from the original forest trees, with which they were shaded, along with the moderate amount of manuring which was generally done, maintained the integrity of the soil. On the same soil at least the new plant grew spendidly. This seems to point to the advantage of the timely introduction of a new variety of plant, and the Coorg planters would do well to return their attention to the subject. Seed from Arabia, or better still perhaps from the indigenous coffee found growing in our new African possessions on the shores of the Victoria Nyanza and other parts, might be obtained. The Government would no doubt willingly help the planter in procuring it. Planters in Wynaad are going in for Liberian, but I think most men would probably prefer the Arabian species. It is to be hoped that everything will be done to avert such ruin as has overtaken the coffee enterprise in Ceylon and elsewhere, for although the fears of those who think the Coorg plantations likely to meet the same fate may not be realised, the planter should do all he can to provide against such a serious contingency. The Government, too, should be alive to the importance of the matter.—*Madras Mail*, Oct. 28th.

SNAKES of the Boidæ family are sometimes found very tightly coiled within the clusters of bananas imported into the United States from the West Indies and tropical America. Not long ago a specimen, which proved to be the *Epicrates angulifer* of Cuba, was captured in Savannah, and is now in the United States National Museum. Another was taken in the same way at Chicago, and found to be the boa imperator of Central America. They are generally young ones, as the adults could not be so easily concealed there.—*Globe.*

Correspondence.

To the Editor.

THE CEYLON TEA INDUSTRY FROM THE POINT OF VIEW OF AN EXPERIENCED LONDON BROKER.

12, Great Tower Street, London, E C., Sept. 26th, 1890.

SIR,—May I trespass again on a space in your paper respecting the tea industry of Ceylon. It appears to me that the fears of the planters have again been disturbed by what appears to me an unnecessary alarm, chiefly caused by the great rise in exchange. The enhanced rate of exchange is certainly an important item in the increased cost of the tea in the selling market, and to compensate for this, the planter or shipper requires an equivalent increase in price. But I would ask the question whether this does not also affect the price of tea from India and China; therefore, on that point Ceylon is no worse off than the other two places of production. Indeed a rise in the exchange is more detrimental to the low-priced China teas than to the better grades which India and Ceylon produce, and therefore it is not likely that China will materially increase its supplies to this country.

Again, in looking at the effect which the increased cost will have upon consumption, it must be borne in mind that the reduction in the duty here, will up to the present time fully meet the difference of exchange, so that practically the consumer is now paying no more than he did before the duty was reduced, and it is a very doubtful question whether the reduction alone of 2d per lb would have led to any marked increased consumption. Further it must not be forgotten that there has of late been a great increase of wages in this country, and increased wages mean increased spending power in the hands of the masses, who exercise that power to a considerable extent, and purchase the better descriptions of consumable articles, than when wages are low: and this is the case notably in sugar and tea.

As Ceylon tea continues to gain favour throughout the country, the consumption under these circumstances necessarily increases; therefore I fail to see how Ceylon tea especially can in any way be injuriously affected. On the contrary, there is now more hopefulness for a full maintenance of present values which already show an improvement, nearly, if not quite, equivalent to the difference in exchange: and any temporary depression in the market can scarcely be considered as sufficient ground for despondency.

The following figures will show the deliveries of tea in London for eight months, by which it will be seen that the percentage in the increase this year of Ceylon tea over the deliveries of last year is more than double of the percentage in the increase of Indian tea for the corresponding periods.

Deliveries of Tea in London for each month from January to August in 1890 and 1889:—

	China.		Indian.	
	1890. lb.	1889. lb.	1890. lb.	1889. lb.
January	7,136,443	8,837,000	8,831,223	8,932 000
February	6,898,341	7,399,000	8,187,293	8,007 000
March	6,519,764	7,939,000	7,141,953	8,143,000
*April	4,681,753	7,565,000	5,155,941	7,721,000
*May	11,494,064	7,901,000	14,492,028	8,741,000
June	6,047,080	5,871,000	8,630,442	7,256,000
July	7,811,703	7,338,000	7,291,524	7,379,000
August	7,311,749	5,931,000	6,861,027	6,030,387
	57,900,897	58,781,000	66,591,431	62,209,387
	Decrease in 1890 of 880,103 lb.		Increase in 1890 of 4,382,044 lb.	

CEYLON.

	1890.		1889.
January	2,215,670	...	1,945,932
February	2,126,498	...	1,915,114
March	2,081,078	...	2,137,832
*April	1,334,678	...	2,105 016
*May	5,019,890	...	2,893,198
June	3,613,768	...	2,667,890
July	3,932,286	...	3,677,728
August	3,793,038	...	3,200,918
	24,116,906	...	20,543,628

Increase in 1890 of 3,573,278 lb.

—Yours obediently, J. HENRY ROBERTS,
(S. Rucker & Co.)

GREEN TEAS IN TRAVANCORE.

October 9th.

DEAR SIR,—As you kindly inserted a letter a few months ago from Travancore regarding Mr. Robt. S. Imray's first experiment and samples in green tea when so favourably reported on by Mr. F. F. Street, it may interest your readers to know what further advances he has made in the manufacture of it. The enclosed is an article which appeared in the Madras *Times* of the 6th. I may mention that Mr. Imray's *first* break of green tea fetched a very fair price in the London market so that there is every reason to expect that his *second* break from which the present sample I believe was taken and sent to Mr. F. F. Street, will fetch a much higher price still, judging from Mr. F. F. Street's report and valuation of it.—Yours faithfully, TRAVANCORE.

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, Oct. 11th.

DEAR SIRS,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 18th September 1890.

EXPORTS OF INDIAN TEA FROM CALCUTTA.

	1890 lb.	1889 lb.	1888 lb.
Exports to Great Britain in Sept.	14,263,059	16,253,978	12,188,328
Exports to Great Britain from 1st May to 30th Sept.	40,415,251	40,761,934	40,025,482
Exports to Australia and New Zealand in Sept. ...	712,200	806,863	495,061
Exports to Australia and New Zealand from 1st May to 30th Sept. ...	2,293,446	1,807,392	1,344,564
Exports to America in Sept.	25,837	23,596	19,990
Exports to America from 1st May to 30th Sept. ...	62,072	90,847.	63,119
Exports to other places in Sept.	195,095	154,311	158,867
Exports to other places from 1st May to 30th Sept.	526,277	1,061,604	464,217
Total Exports from 1st May to 30th Sept. ...	43,297,016	43,721,777	41,897,382

—Yours faithfully, S. E. J. CLARKE, Secretary.

A COLLECTION OF SEEDS OF INDIAN AQUATIC PLANTS, such as the Sinhara nuts and others, are to be sent from India to New South Wales for experimental cultivation there under the local Agricultural Department.—*Pioneer*, Nov. 6th.

MR. ROBERTS ON FACTORY-BULKED TEAS AND ON SILVER AND EXCHANGE.

October 17th.

SIR,—In reply to "Inquirer's" letter which appears in the *Overland Observer* of 20th Sept. last, page 976, about "factory-bulked" teas and exchange, I hope the following explanations will supply the information required.

If packages of tea are marked "factory-bulked," and on examination after arrival here the teas in those packages are found to "run evenly," and provided also the tares of the packages are of uniform weight—they are passed as "factory-bulked" and sold accordingly; but if found otherwise, although marked "factory-bulked," they are re-bulked here.

In the case of packages *not* being marked "factory-bulked," the teas are bulked here as it is presumed they have not been bulked at the "factory."

If parcels marked "factory-bulked" could always be relied on as being of even quality and even tares, the trade generally prefer these, so as to avoid the necessity of turning out for bulking in the warehouses here which is done to ensure uniformity.

With regard to the other enquiry as to the relation between the prices of Bar Silver and Exchange, it invariably follows that as the price of Bar Silver fluctuates, so the rate of Exchange rises or falls in the same ratio, though there is no fixed standard of an *exact* proportionate difference, as other circumstances occasionally intervene to cause variations. Bar Silver in the early part of July last was at about 48d to 49d per ounce and Exchange was then about 1s 6½d; when the price of Bar Silver in the beginning of Sept. rose to 54½d, Exchange rose to 1s 8½d; and recently again, with Bar Silver at 50d, Exchange is 1s 6¾d;—the percentage of rise and fall being in both instances about equivalent, and which, for all practical purposes, may be taken as a safe basis for calculation.
—Yours faithfully, J. HENRY ROBERTS.
S. Rucker & Co., 12, Great Tower Street, London, E. C.

COFFEE PESTS.

London, October 17th.

DEAR SIR,—To leave no stone unturned to try and find out some remedy or palliative for green bug and fungus on what remains of our once fine coffee fields in the Uva district, I applied to the foremost authority in England on insect and other pests which devastate our fruit trees, viz., Miss Ormerod. In case it interests you I enclose her correspondence, but I had to wind up by stating that in my 43 years' experience of Ceylon I had made the acquaintance of all the Ceylon authorities she quotes, viz., Mr. Nietner, Mr. Green, and lastly Mr. Morris to whom she refers me, and that in the case of the latter he had, like Balaam of old, been called to curse and lo! he found himself powerless before *Hemilea vastatrix* and had to go home even like the son of Beor.

I am now sending to Ceylon a keg of sulphate of copper such as has been found so useful in the vine disease and we will try it on a few rows of coffee after I have acquired the knowledge as to application, and this I hope to receive in a day or two.—I am, yours faithfully,
THOMAS DICKSON.

St. Albans, Sept. 26th, 1890.

Thomas Dickson, Esq.

DEAR SIR,—I am always glad to be of use so far as the intensely heavy amount of work sent to hand permits, and though I am not acquainted by *personal* observation with the coffee attacks I will try to offer some suggestions.

You mention "An insect called 'Green Bug' (Aphis) forms its scales in our coffee tree branches," &c., &c.

From the mention of "scales," I conjecture the pest to be *the* "Green Bug Scale" insect—the *Lecanium viride* scientifically—on which it so happens that I have a very careful and as far as I can judge good practical paper.

But first with regard to your enquiries. I have *never* used sulphate of copper as an insecticide; therefore am unable to offer any advice on the subject. As I rarely work on extra-British attacks, perhaps you are very much better informed than myself as to what answers—but as in the case of this insect it is presumably expected to kill by contact,—and if your attack is a scale, so very much of the infestation would, for a while, be sheltered under the parent insect that I should not *expect* it to be of much use; and so far as I know I should expect it would be likely to do a deal of harm to foliage.

The very best reply that I could give to your enquiries would be to lend you my pamphlet, and I would do so with pleasure if you would distinctly *promise* me to return it within a fortnight. I am so greatly inconvenienced and injured by books not being returned that I now hesitate to lend any.

But in this pamphlet is reference to Phenyle being used as a watering at the root, and I have myself found such excellent effects brought about by the application of this in the form sold as "Soluble Phenyle" that I think it might be well worth trial.

But with regard to washes, I should think that soft soap and kerosine (or mineral oil) washes would be far more likely to do good than sulphate of copper.

You want something *tenacious* which will stick to all the little "buglets" before they have settled down into full development with the sheltering scale, and also something which will so coat the mothers scale that the eggs beneath her, or young hatching larvæ (popularly "buglets") may be killed before they escape.

What is known in South Australia as Burford's "Soap and Sulphur Compound" is easily mixed and I should conjecture would be serviceable.

You have to remember in dealing with attacks of insects of the kind you name, *i.e.* bug or scale (or Aphis) that it is probably of *no* use to attempt to *poison* them. They feed by inserting their suckers into the tissues whence they draw their supplies; therefore however, poisonous the wash it is more likely than not that unless it is so caustic that it kills by contact, (and also damages the vegetable tissues) it will do no harm to the insects.

What you need is a *sticky* wash such, for instance, in general nature as is used for hop wash in England. This settles *on* the insects and chokes up their breathing pores, or in the case of the eggs, prevents them hatching. With regard to formation of these washes (or "emulsions") you would find endless good recipes in the publications of the U. S. A. Government.

If you care to study recipes taken by myself from almost world-wide (authorized) sources you would find many very good working ones in my own Manual just published, of which I enclose a circular. Under the head "Soft Soap Washes in India" you will find reference to mixtures found serviceable for scale, aphis, &c., &c.

I do not like to suggest purchase of a book of my own; but I cannot give you the recipes at full length in a letter and I know no other work where you would find at any moderate price similar details.

Trusting that this may be of some service, I am, yours truly,
ELEANOR A. ORMEROD.

St. Albans, Oct. 7th.

Dear Sir,—Enclosed is the paper on the "Green Scale-Bug," in which I hope you may find something useful.

I know that in the case of the attack known as "rust" in carrot I have found much good result from the use of a preparation sold by Messrs. Morris & Little, Doncaster, called "Soluble Phenyle." This is to

some slight degree absorbed into the plant as shown by analysis, and also the preparation contains stimulants to growth (what I do not know), so that the mixture acts well in more ways than one. It is a fertilizer and an insect deterrent, so far as carrots are concerned, but I do not know whether it would answer on the large scale of coffee growing.

Do you know "The Coffee Tree and its Enemies" by the late J. Nietner, Ceylon, 1880? There is a deal of information in it both on *Hemileia* and Coffee insects? When you return me the enclosed I would lend this to you if you like, but I believe it has long been out of print; so I should have to ask you to be sure to return it to me.

Hemileia being a fungus is not in my line of work—my Department at the Royal Agricultural Society is British Agricultural Insect Pests—but I am only thankful if I can be of service, and I should think that if you were to write to Dr. D. Morris, Sub-Director, Royal Botanic Gardens, Kew, Surrey, that he would be able to give you the names of the most approved publications on the subject.

If you were able to run down to Kew yourself this would probably greatly facilitate. You could consult the chiefs at the Herbarium and see publications.

It is not in the regular work of Mr. Jackson, the Curator of the Museums, but he is a very old and valued friend of mine, and if you could see him I am sure (in case that is if you wish for an introduction) that if you mention my name he will do all he can to put you on the right path to obtain information. His address is, J. R. Jackson, Esq., Royal Botanic Gardens, Kew, Surrey. And he would tell you when he was likely to be at the Lake Museum where his offices are more especially.

As you say it seems hopeless to wash at the rate of 1,200 trees per acre, but yet we are obliged even in England to wash and greaseband on a great scale. At Toddington we have 120,000 trees thus to attend to.

Did I enclose a circular of my new Manual? I think that most kinds of available wash musts u rely be named.—Yours truly, ELEANOR A. ORMEROD.

THE NEW WEIGHING AND TARING REGULATIONS.

October 17th.

DEAR SIR,—Can you explain the new weighing and taring regulations for tea at the London Customs?

I do not understand what is wanted to insure the minimum loss of weight: it appears more important to have the tare correct than the net weight, but perhaps some correspondent of yours will be able to give us an example.

Supposing a break of 40 chests tared from 23 lb. 8 oz to 23 lb. 14 oz. for the whole 40 chests and it was desired to pack 90 lb. net with minimum loss in weight, how would one set about packing it and the next break say also 40 chests taring from 24 lb., to 24 lb. 7 oz, also to contain 90 lb. net?

What I wish to arrive at is the necessity or otherwise of taring within half-a-pound. Under the old system if your packages tared say 23 lb. 14 oz. it was called 24 lb., and to get in 90 lb. certain one would add 90 lb. 2 oz., making 114 lb. 2 oz. gross = 114 lb. If one's package on the other hand tared 23 lb. 2 oz. it was called also 24 lb., and to make the total 114 lb., one had to add 16 oz. tea; it was obviously important to have one's tare as nearly under a full number of lb. as feasible when the loss in weight (*i.e.* extra tea put in chest) was reduced to a minimum.—Yours faithfully, dear sir, INQUIRER.

EXAMPLE.

Pekoe. (Gross 114 lb. 2 oz. = 114 lb.)

		lb.	oz.	lb. oz.
5	chests tare say	.. 23	8	(90 10)
6	" "	... 23	10	(90 8)
14	" "	... 23	13	(90 5)
15	" "	... 23	14	(90 4)

4 chests

Pekoe Souchong. (Gross 115 lb. 2 oz = 115 lb.

		lb.	oz.	lb. oz.
14	chests tare say	... 24	2	(90 16)
10	" "	... 24	3	(90 15)
5	" "	... 24	6	(90 12)
11	" "	... 24	7	(90 11)

40 chests.

With regard to above tares it is desired to pack so as to get credit for 90 lb. net tea.

The figures in brackets represent the tea which would have had to be packed under old system.

[We trust some public-spirited Broker or Tea Buyer will give planters the benefit of their opinion on the above.—ED. *T. A.*]

CEYLON TEA IN RUSSIA.

Kandy, Oct. 22nd.

SIR,—This is certainly most gratifying intelligence about Russia going into the market for our tea, but where is sufficient of the article to come from to supply Australia, America and Russia as well as England? That I fear will be the rule! If agents for the customers named come here and find they cannot satisfy their orders, is it not to be feared their clients will go elsewhere? Producers should therefore do their utmost to keep the local market well supplied.

I look with confidence to 75 cents per lb. being the average before another twelvemonths are over our heads. 'Maun it be so"! Then look out for a "boom.' ONE INTERESTED.

"CHERTSEY" TEA AT THE TEA SALES.

Chertsey, Yatiyantota, Oct. 30th.

DEAR SIR,—I regret to find that a mistake has occurred in your paper: I would therefore thank you to be good enough to rectify same.

The actual prices realized by Chertsey at the local sales lately, were as follows:—

100 lb.	Bro. Pekoe out at	..	55 cents
270 ,,	Pekoe Sold at ..	..	41 ,,
200 ,,	Pekoe sou. out at	..	38 ,,
80 ,,	Souchongs out at	..	34 ,,
180 ,,	Pekoe Fannings sold at	..	33 ,,

In the local papers my broken pekoe, I find, has been put down as "out at 51c": this is misleading, and may have an influence of an unfavourable shape on the bids at future sales.

Hoping you will place this matter to rights I am, dear sir, yours faithfully, F. J. DICKSON.

TEA EXPORTS.

The Strathellie Tea Co., Ltd.,

Nawalapitiya, Nov. 3rd.

DEAR SIR,—Now that the Commercial Season has been altered from the fiscal to the calendar year I intended postponing until next month my computation of probable export of tea. At your request, however, I now give my figures for the fiscal year. You will observe that they are made up on the same basis as regards acreages which I have on previous occasions taken, adding however 20,000 acres as giving their first returns at say 100 lb. per acre, and that I have allowed for a slight decrease on the *maximum* acreage rate, with the increased area (70,000 acres). My approximations *again* run out

somewhat in excess of yours ;

70,000 acres at	340 lb.	per acre	=	23,800,000 lb.
45,000 "	300	"	=	13,500,000 "
35,000 "	250	"	=	8,750,000 "
30,000 "	150	"	=	4,500,000 "
20,000 "	100	"	=	2,000,000 "
		Total say		52,550,000 "
Deducting the odd 550,000 lb. for local consumption				550,000 "
We get probable exports at say ...				52,000,000 "

Uva will make a distinct mark on tea exports this season and if no serious labour difficulties intervene, I fancy my estimate of 52 millions will be overtaken.—Yours very truly,

ARTHUR E. SCOVELL.

PADDY OR RICE CULTIVATION IN CEYLON.

Nov. 6th.

SIR,—A controversy has been for long carried on and still continues as to whether the cultivation of rice is a remunerative or an unremunerative industry. In a recent issue of your paper was printed a contribution thereto by a public servant who claims to have proved by an account of four experiments, over three of which he lost money, that the cultivation is a profitable one ; while other persons have on other occasions published accounts of experiments by which they have purported to show that the cultivation of rice is the shortest and easiest road to ruin, or, as the case may be, the readiest route to the heaven of Mr. Andrew Carnegie.

The present writer, who has never sown a grain of rice or turned a watercourse or cheated a renter, ventures very respectfully to submit to the parties to this controversy that they are shooting wide of the mark if what they wish to find out is not what the returns should be, but what to the ordinary unlearned agriculturist they actually are. In so far as the question is of other than academic interest, it is interesting only as the results will enable us to gauge and estimate the condition of the ordinary native inhabitant of the country. The question is interesting not as an agricultural but as a political problem, and as such it is solved by demonstrations which employ factors that are outside the lines of native usage. The Government Agent of the Eastern Province has tried his experiment with an English plough in his hand and an agricultural primer in his pocket; other experiments and experiences of which accounts have been published, though lacking these advantages and differing among themselves in other respects, all agree in this that the system on which the labour has been employed and paid is different to that used in the ordinary course of native cultivation. If then what we want to find out is how the native agriculturist gets on in his native simplicity, and personally that is what we desire; then and in that case our experimentalists throw no light on the question.

It has occurred to your correspondent, who has been pondering over the little results of so much misapplied ingenuity, and he is not a little vain of being the first person to make public so recondite a suggestion that the proper way to ascertain whether a native industry is remunerative is to enquire what classes of workers are engaged upon it, and to ascertain first the outgoings and then the distribution of the net proceeds, and he has thought that these particulars, if correctly ascertained and reported are likely to go further to throw light on the matter that the experiments of a whole college of agricultural instructors.

But before going further it would be well to define—it would have been of no small advantage to the parties concerned to have done so earlier in the dispute—what precisely the question at issue is. Is or is not the cultivation of paddy a remunerative industry? Remunerative to whom? The answer which is bound to come—"the goyiya"—is not sufficient, for Mr. Elliott clearly is answering the question as if it referred to a capitalist landowner, and most of the other contributors to the discussion have done the same; some appear by the "goyiya" to mean the day-labourer to the exclusion of the landowner, and yet others, (among them the editor of the "Independent,") take him in his double capacity as landowner and labourer, and do not hesitate to state that he makes nothing in either capacity.

Let us appeal for a moment to Political Economy. It is a maxim of that science, undisputed even in Ireland and probably unsuspected by the parties to this argument, that the three elements and the only three elements of production are land, labour and capital, the returns for their services received by the three cooperative elements being respectively rent, wages and interest. Our goyiya in his native simplicity may represent one, or two, or all three of the elements at once, and the returns he draws from the cultivation may be either wages only, or wages and rent if he is the landowner as well as the cultivator, or wages, rent and interest if he supplies from his own resources his seed paddy, and the other needful if scanty capital. The industry will be unremunerative if it returns to the landowner less rent than he would have obtained had he devoted his land to some other cultivation : unremunerative to the labourer if he draws less wages in it than he would have gained if he had devoted an equal quantum of industry to other pursuits: unremunerative to the capitalist if he draws from the capital advanced for employment in it a lower return than he would have obtained if it had been used in some other way.

It is then apparent that the question resolves itself into three; and an endeavour will now be made, by a statement of the native practice in the employment of labour and the distribution of crop, to show how answers must be sought to those three questions. It is to be premised that by the native agriculturist nothing whatever is paid for, neither the labourer's wage, nor the capitalist's interest, nor the landowner's rent, until the harvest is reaped, and that the wisdom of immemorial antiquity going before the wisdom of the Education Department ordained that the labourer in the rice field like the modern schoolmaster should be paid by results. The system is this : All those persons who have had any share in producing the harvest being present, and the crop having been reaped, threshed and cleaned, the whole as it lies is divided as follows :—

(*a*) 1-10th gross crop to the landowner to meet his liability for the Government tithe.

(*b*) 1-7th gross crop, for the cost of reaping and threshing.

(*c*) $1\frac{1}{2}$ times the amount sown to the person who provided seed paddy—the supply of seed paddy being a privilege of the owner.

(*d*) Sundry small payments, for services rendered : huwandiram, measuring, the soothsayer, &c., &c.

After the above deductions have been made, the balance is divided into three equal parts, of which the owner takes one (*e*), the person who supplied

cattle (usually the owner) a second (*f*) and the cultivator the remainder (*g*).

Clearly (*a*) and (*c*) are rent, (*c*) and (*f*) the profits on capital, (*b*), (*d*) and (*g*) are wages.

If the crop fails wholly, no one gets anything but (*a*) and (*c*) remain a debt to be discharged out of the next harvest. If in part, the deductions are made in the order (*b*) (*c*) (*a*) and the balance, if any, distributed by the rule. It must be remembered that this distribution is not the same for all fields, or for all parts of the country. The systems of distribution are many, but they are all on the same plan; the one above described is for a field yielding 10 fold: a common class of fields. Richer fields yield a larger and less fertile fields a lower rent, the balance being divided in different ways. The less fertile the field the better the *apparent* though not the real wages: this being, of course, to meet extra labour in cultivation and increased risk of loss.

It follows that among native cultivators, pursuing their cultivation in accordance with their own customs, the landowner gets a rent in kind exactly proportioned to the productive capacity of his land; the capitalist gets a certain and liberal interest on his loan, and a proportionate return, if successful, on that portion of his enterprise which he has entered on as a speculation; and the labourer a return in proportion to the success of his labours. But does the landowner thus get a less rent for his land than he would if he cultivated it with some other product, that is, is the industry unremunerative to him? In Colombo the native paddy-landowner has turned his paddy-land into grass fields; outlying corners of fields, unfertile or incapable of irrigation, are in the Western and Southern Provinces sometimes planted with coconuts: very rarely in old days the Kandyan planted coffee in his disused rice field, but on the whole, once a paddy-field always a paddy field is the rule in Ceylon. Even the Jaffna Tamil who grows everything keeps his paddy-field for its accustomed use in its turn. Surely it is probable—the writer is not a philanthropist and will therefore not venture to dogmatise,—that this is so because it is to the owner's interest; in other words because paddy land owning is remunerative. For what is the alternative? That a very large body of persons, and no inconsiderable number of whom are wealthy, intelligent and speculative commence or continue to grow rice on land which could be more profitably employed otherwise, because (*a*) it is the custom or (*b*) because they are oppressed by unpaid headmen or (*c*) because they think the cultivation of rice a more honourable pursuit than others. These are the only reasons that are ever offered us on the other side and it is not for a seeker after truth to deny that they may have weight, but do they account for *all* the facts? A large body of persons, Sinhalese, Tamil and Malay have migrated from Hambantota and its neighbourhood to Tihawa to cultivate rice. Was it under the influence of custom, or at the instigation of unpaid headmen, or in the pursuit of reputation, or did they hope to make and—for they are constantly being followed by others—do they make money?

Is that wealthy speculator Mr. de Mel seeking the bubble reputation at Muturajawela, or is he terrorized by a village arachchi?

Under the new Walawe irrigation work in the S.P. not yet working 1,000 acres of Government land have already been purchased by private buyers: are they seekers of honour, slaves of custom, or victims of the Geat Unpaid?

Are the rich Moormen who poured their money into the Government coffers in return for irrigable land in Batticaloa content with the mere name of landowner, or do they hope for a profit?

The local philanthropist tells us that they have engaged in the least remunerative of native industries. Have they, and if so why have they, or do they by any chance understand their own business better than the local philanthropist?

And, now comes the turn of the capitalist. He need not keep us long; nobody ever wastes a tear on him. On his advance of seed paddy he gets 50 per cent interest certain, and he may be trusted to be making a good thing over any other advance he makes. Let us leave him and turn to the labourer. Does the labourer in the rice-field get more or less than a similar amount of work would earn for him in other occupations? No one can certainly tell; for though it is possible to measure his receipts, no one can measure the amount of his work, for the fact is this, that 2 or 3 days of arduous labour at the beginning once over, the rest consists of a hand's turn done at odd times and is by no means incompatible with the contemporaneous pursuit of other industries.

It is constantly stated in this connexion that Sir C. P. Layard, a very high authority, expressed his opinion that labour in the rice-field was the worst paid of all labour. It is usual for the philanthropist and sometimes for less positive and better informed persons to quote as nearly as he can remember them Sir Charles's words and to apply them to both branches of the industry—but this is because he has never had them with their context in the original. The statement is, if the writer—who is far from books of reference—is not mistaken, contained in one of the earliest printed Administration Reports of the Government Agent W. P.,* in the course of which an account is given of the improvement in the position of the peasantry following on the extension of the coffee enterprise. Mr. Layard, as he then was, spoke of the wages to be earned by Sinhalese as carpenters, cart drivers, fellers of jungle, &c., and he added, (the quotation is from memory): "Paddy cultivation is about the least remunerative industry in which a villager can engage." Too much has been made of this very moderate statement of an opinion, which went in fact no further than that, at a time when speculation was brisk and the coffee industry in the height of its prosperity on the borders of W. P., the stay-at-home agricultural labourer could make less wages by following his ancestral pursuits in his native village than he could earn by migrating to a place where business was brisker and by their plying such trades as he was fit for. It has no sort of application to the employment of the agricultural labour in ordinary times and at a distance from European centres of trade and speculation, and it does not refer to the landowner at all. But, that being so, the opinion so expressed, probably a correct one so far as it then went and in the place for which Sir Charles intended it, is not to shut out all further argument concerning consideration of the point? Let us try the question by such other tests as are at disposal.

What are the best known or least disputed points in connexion with Sinhalese labour? They are these. That during the periods when paddy farming operations are in full swing it is impossible by the offer of any reasonable wages to induce the Sinhalese to engage in any other works and that no field in a fairly populous district ever lies uncultivated for want of labour. If these two undisputed facts are not to be accounted for by the remunerative nature of the work, what

* The statement was made in answer to our personal enquiry and embodied in a "Summary of Informations" some thirty years ago, but "A." 's argument is all the same very strong.—ED. *T. A.*

is the explanation? Why is it that, though the planter may want labour for his estate, the Government for the roads and the native employer for his plumbago pit, the owner of a paddy-field never lacks an *andakaraya*? Is it due, as we are told, to the tyranny of custom, the oppression of the unpaid headman, or the keenness of the villager in the pursuit of honour?

Or is it—*it seems possible*—that the villager likes best the work at which he can make most wages in the easiest and most congenial way? At least he himself never complains of the work but only that there is not enough of it.

Are we all quite sure that we know the villager's business, as we know that of the native capitalist, better than he knows it himself?—Your obedient servant, A.

SUNFLOWER AS FUEL.

DEAR SIR,—With reference to your article on the *fuel question* I enclose an extract which appeared some years ago in the *Observer* in case you may think it worth while to reproduce. I know how the sunflower grows in the lowcountry, and I believe it must thrive better higher up. It appears to me that an experiment on a small scale might easily be made just to ventilate the matter—from sowing to reaping would only take about four months, the question of rich soil would be no great obstacle, as no large area would be required, and if systematically grown the resulting potash could be reapplied to after crops—with any other available manure.—Yours &c., ——

(*Extract referred to.*)

SUNFOWERS AS FUEL.—A correspondent of the *Dacota Farmer*, after having tried "turf," Coalwood and Sunflowers, has settled upon the lastnamed as the cheapest and best for treeless Dakota. He says: "I grow one acre of them every year and have plenty of fuel for one stove the whole year round, and use some in another stove besides. I plant (? sow) them in hills the same as corn (only these seeds to the hill), and cultivate same as corn. I cut them when the leader or top flower is ripe, and let them lay on the ground two or three days; in that time I cut off all the seed heads, which are put into an open shed with a flow in it, the same as a corn crib; the stalks are then hauled home and packed in a common shed with a good roof on. When cut in the right time the stalks when dry are as hard as oak, and make a good hot fire, while the seed heads with seeds in, make a better fire than the best hard coal. The seed being very rich in oil it will warm better and burn longer bushel for bushel, than hard coal. The Sunflower is very hard on land. The piece of ground selected to plant on should be highly enriched with manures. In the great steppes (prairie region in the interior of Russia and in Tartary) where the winters are more severe than here in Dakota, the Sunflowers are, and have been for centuries past, the only kind of fuel used."

SUNFLOWER CULTIVATION: PRACTICAL EXPERIENCE.

Storm Lodge, Colombo, Nov. 10th.

DEAR SIR,—In your issue of Saturday is a letter on sunflower as fuel. Having experimented on the plant I give you results. For the many uses to which flowers, seeds, and stems may be put, consult, "Beeton's Dictionary of Daily Wants," which gives full information with directions for cultivation. When living in Maskeliya (1876-1880) I grew sunflowers in a part of my garden for feeding poultry. There was a rose hedge near, with the usual accompaniment of small beetle. These visited the flowers in thousands feeding on the stamens, but, so far from doing harm, by their agency the seeds were fertilized and every head was full of good seeds.

In 1885 I got out two bushels of seed from Sutton's, 'Giant Russian" variety, to see if it would pay to cultivate in the lowcountry for oil. Mr. S. C. Obeyesekere very kindly cleared two acres of virgin forest for me on his estate at Rambukkana. We planted the seed 18 inches apart in rows three feet from each other, the result being a very large crop of flowers, some of which measured over a foot across; but nearly all the seeds were *deaf*, a few only at the lower border of each being fertile. This was probably due to the absence of insects; the seeds that were fertile having become so by pollen dropping down on them from above.

In addition to this clearing Mr. Jameson and I rented ten acres at the Model Farm, which we planted in a similar manner. Unfortunately, just as the plants were coming up, Capt. Cleland, although warned by the man in charge, marched the R. D. F., followed by a large crowd of natives over the ground, the result being that all except a few growing round trees were trampled out.

Those that remained being amongst roots and under shade grew up small, their flowers also being small and, like those at Rambukkana, partially fertilized, probably from a similar cause.

In all we got a few bushels of seed which Mr. ———— very kindly crushed in one of his poonac mills, the result being five bottles of oil, smelling strongly of coconut oil; this from the mill. I sent this to a friend in London who submitted it to a firm of oil merchants. They reported it as worth about the same as coconut oil, but that perfectly pure oil would be worth as much as olive. You will see that Beeton says "sunflower affords good pasture for bees." I am sure that with their assistance, or that of other insects, it can be very profitably grown in many parts of Ceylon.

I forgot to mention that the stems of those grown in Maskeliya burnt in a stove (They were pithy and not a bit like oak, as you mention,) gave a very large percentage of potash, some pieces, especially roots, coming out like coral—only much more brittle and friable.—Yours faithfully.

T. H. F. TOTHILL.

TEA-GROWING IN RATNAPURA.

Ratnapura, Airy Hill, Nov. 11th.

DEAR SIR,—I have this day posted to your address a sample packet of tea grown on a land in the town of Ratnapura and prepared at my own residence. I shall thank you to try the tea sent and afford me your opinion.—Yours faithfully,

J. P. JAYEWARDENE, Head Clerk, P. R. C.

[The tea seems very well made, but the flavour is peculiar and an expert says this is owing to over-firing. This can readily be avoided again.—We are not at all afraid of the result should the Sinhalese gardenholders turn their attention to tea, for before they produce their million lb. or so, we may expect one if not two millions of the population of Ceylon to become regular drinkers of the new beverage. —ED. *T. A.*]

JUTE MESH FOR TEA.

Yatiyantota, Nov. 13th.

SIR,—I send you, as promised, samples of jute mesh made in Calcutta. I have been expecting another sample of a better make of the single yarn mesh (both warp and weft should be hard spun), but it has not come to hand. The prices of these will be about 18c. and 15c. per yard.—Yours truly,

E. F. DAVIS.

[The samples referred to can be seen by anyone interested at our office. They seem substantial enough.—ED. *T. A.*]

EXPERIMENTS AT THE SCHOOL OF AGRICULTURE.

Mr. S. Davis, Travelling Agent for an American firm of implement makers, accompanied by Mr. W. H. Davies, visited the School of Agriculture this morning by arrangement, and spent about two hours in demonstrating the use of some new inventions. Two hand implements were first tried, with attachments for hoeing, raking, moulding, &c., which worked most admirablly in the Indian corn and turmeric plots. They are well adapted for all manner of crops sown in rows, and are the most perfect implements of their kind. The amount of labour and time thoy save are incalculable, while the prices of the machines are comparatively cheap. Next an experiment was mads with the horse hoe which was attached to two buffaloes. This implement was also made to do the work of ploughing, skimming, moulding, trenching, &c., and is said to be largely used in tobacco and sugar-cane plantations. The exhibition of the working of theso machines was much appreciated by the students. The horse-hoe is perhaps too heavy for the cattle of the country, and there is probably not much scope for the use of the implement, which may also bo too expensive for the Ceylon Agriculturist, but the hand machines, which can no doubt be seen at Messrs. W. H. Davies & Co's. ought to have a good sale in the island, as they are simply invaluable for garden cultivation of every kind, Indian corn (which by the way is being very successfully raised at the School of Agriculture) and such crops.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &C.,

EDITOR OF "SCIENCE GOSSIP."

Dr. Beyerinck has just described before the Royal Academy of Sciences at Amsterdam some highly interesting and important experiments relating to the infection of the common bean (Vicia faba) with a species of bacillus (Bradicola). He filled twelve pots with sterilised river sand, which had been rendered very poor in nitrogen by washing with distilled water. These pots he divided into four sets of three each. On April 25 a well-sterilised seed of the bean was planted in each pot. The dust of the air was wholly excluded from the pots, and arrangements were made so that the watering was carried on under dust exclusion. The first sot of pots was watered with 0·1 of phosphate of potash, 0·03 chlorate of lime, 0·06 su'phate of magnesia, dissolved in one litre of distilled water. The second set with the same mixture; the third set ditto, to which was added 0·2 grammes of nitrate of lime; and tho fourth set ditto, to which was added 0·2 grammes of su'phate of ammonia. When the plants had developed their second leaf, the throe pots of the first set and one single pot of each of the other three sets wore infected with a gelatine culture of bacillus, cultivated in 1889 from the tubercles of tho common bean, and since that time kept in successive cultures. The bacteria used to infect the beans with were mixed with sterilised common water. On June 20, on one old cotyledon of a bean, a fungus (penicillium) was found. The experiments were, therefore, not continued further. All the plants were taken from the pots, and their roots were well washed and examined. Every one of the six infected plants bore many tubercles, whilst not one of the six remaining non-infected plants showed the least sign of tubercles. Dr. Beyerinck showed that the presence or absence of nitrogen, as nitrate or as ammonia, is indifferent with regard to the practicability of the infection.

That nitrifying organisms exist in the soil has been known for some years past. A French scientist, however, has communicated to the Academy his discovery that not only aro nitrifying microscopic organisms universally distributed, even on the bare rocks of mountain peaks, but that to them may be attributed a considerable share in the important work of breaking down rock-masses into soils.—*Australasian.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Oct. 23rd.

CINCHONA.—At Tuesday's auctions a fair average supply of bark was offered for salc, the catalogues includiug :—

	Packages		Packages	
Ceylon bark ...	1,658	of which	1,251	were sold
East Indian bark ...	735	do	484	do
South American bark	1,129	do	431	do
Total ...	3,522	do	2,166	do

The assortmcut was a fairly good oue so far as the Ceylon cinchona was concerned, while East Indian barks also included some very good lots, particularly in Succirubras and Officinalis, a large proportion being of somewhat old import. South American Calisayas were strongly represented, and met a fairly steady sale, up to 1s 1d per lb being paid for the richest lots, though it is doubtful whether the average price now realised by these barks is a remunerative one for the growers. No Java bark was offered at all. The sales opened with a fairly good competition, but this ceased after the first two or three catalogues, and prices gradually ceased off, a large proportion being bought in. The average unit may be placed at about 1⅜d per lb, or, say, about 8 per cent lower than at the previous auctions. Druggists' barks, however, were in very steady request, and realised full values generally. One of the German manufacturers did not competo at all until near the end of the auctions.

The following are the approximate quantities purchased by the principal buyers :—

	Lb.
Agents for the Mannheim and Amsterdam works	107,231
Agonts for the American and Italian works	73,520
Agents for the Frankfort o/M aud Stuttgart works	52,121
Agents for the Bruuswick factory	49,547
Agents for the Pelletier works ...	48, 33
Messrs. Howards & Sons ...	42,773
Agents for the Auerbach factory ...	36,740
Mr. Thomas Whiffeu ...	25,115
Sundry druggists	30,097

KOLA.—A small bag (41 lb.) of good bold well-dried West Indian seeds sold by auction last Friday at the extraordinary price of 2s 8d per lb. For fair dry nuts 2s 6d to 2s 7d per lb. has been paid privately this week. The report that sales have been made at 1s 9d in Liverpool is discredited here unless the quality of the kolas is exceptionally poor.

COCONUT OIL : rather lower, good to fine Cochin, on the spot, 34s to 34s 6d ; for distant shipment, 33s 6d c. i. f. is quoted ; fine Ceylon may be had at 33s on the spot or at 29s c. i. f. for distant shipment.

THEFT OF CARDAMOMS AND CACAO FROM THE YATAWATTE ESTATE.

IN THE POLICE COURT OF MATALE.

November 8th.

Jas. R. Martin, complainant *v.* Kandi Carpen, Defendant.

In this case the complainant, who is a gentleman known as being "loath to come to Court," charged the accused with tho theft and unlawful possession of a quantity of cardamoms partially cured, property of Lanka Company, valued at R3. It appears that for some time past the outturn of the cardamom crop when cured ran short in small quantities, and the complainant had reason to believe that some light-fingered person or persons had something to do with it.

In evidence it transpired today that the defendant was employed by Mr. Martin on both Ross and Yatawatte estates, and owing to his having been suspected of misconduct was paid off.

The accused engaged a house in the Yatawatte village about half-a-mile from the estate and was keeping a "kada" there dealing in dry fish, arecanuts, etc.

On the evening of the 6th instant he was coming along the village path and when he got on to the main road, met the clerk of the estate and a sawyer. The former questioned the accused as to the contents

of the bundle under the arm when he said it was arecanut and as things would have it, the sayer said that he wanted a chew of betel badly and both felt the bundle when the accused dropped it in the hands of the latter and ran away. The evidence for the complaint proved conclusively the possession and the charge having been read and explained the defendant said he had cause to shew and wanted time to get his witnesses which was allowed, the accused in the meantime being remanded till Friday next.

The next case was that in which one Podia was charged with the possession of some Cacao partly cured. The accused in his statement said that he had purchased the Cacao from Kandi Carpen (accused in the previous case) and had paid him R5. This boy used to go about in the Yatawatte village from house to house trading in dry fish, salt and other sundries, at the same time purchasing whatever he gets from the villagers and from what could have been gathered. Podia was a ready purchaser from Kandi Carpen; this case is also fixed for Friday next, Podia being remanded.

It is an admitted fact that cardamoms of the Malabar variety are not grown within a radius of six miles from the Yatawatte estate with the exception of a few bushes on Nawagala which does not give a crop worth curing, neither are there any bushes of this variety in the village.

As regards Cacao there are but very few trees scattered about the village and not a single villager could have the quantity taken up and none of them know the process of curing as this quantity had been.

PEARL FISHING is still carried on—says a home journal of Oct. 31st—on the Tay, though by no means to the extent that it used to be. Last week a brooch was presented to a lady of the neighbourhood in which were forty Tay pearls, six of them being large and valuable.

TEA AND PROGRESS.—Another sign of social progress is the new Tee-to-tum cafés in the East-end. A quiet elegant and almost artistic one may be found in the Commercial-road, and a less pretentious but very pleasant one exists in the Whitechapel-road. These cafés are founded and managed by Mr. Buchanan, a wealthy tea-merchant, who is quite an enthusiast for social reform. He does not desire to make money out of the enterprise, but to provide an attractive place which shall be at the same time restaurant and club for the East-end masses.—*L. & C. Express*, Oct. 31st.

TELEGRAPH LINES are subject to a great variety of pests. In the neighbourhood of Rio Janeiro, says the London *Globe*, there is an orchid that flourishes on the excrement of birds which encrusts the wire and the "earth contacts," resulting in leakage of the current to the ground, which is a fruitful source of trouble. Again, in Japan, where the lines run along roads bordered by cryptomeria trees, the large webs of a spider, dripping with rain or dew, frequently interrupt the traffic. In Norway the poles are often perforated by a large woodpecker, which is supposed to mistake the humming of the wire for a nest of insects in the wood; and we now learn from Arizona, U. S., that the green woodpecker of California, *Melanerpus formicivorus*, is in the habit of digging cavities in the red cedar poles. In these it builds its nest or stores the larvæ upon which it feeds. Of course, the poles are snapped across by the high gales. In Ceylon, branches of coconut palms falling on the wires sometimes drag them down, and on the Wilson's Bungalow road, a vegetable growth has been pointed out to us on the wire, arising doubtless from bird droppings, which interferes with insulation.

PARIS GREEN AND LONDON PURPLE.—The *Gardeners' Chronicle* hears of much recklessness in America in the use of this poisonous tree dressing, and others deleterious to human beings and grazing animals. The requisite quantity is often greatly exceeded, thereby adding to the cost and labour of its application. One farmer used it over a crop of cabbages, and caused serious illness to those who partook of them. Too much caution can scarcely be taken in the employment of these preparations of arsenic. Sulphate of copper is somewhat less poisonous, and it is almost equally efficacious when used against the Codlin-moth and mildew. This is what has been recommended in a mixture for green bug on coffee.

SEA-WATER AS THE SOURCE OF GOLD.—We were aware that silver in quite appreciable quantity was diffused in the ocean, but now we learn from a paper read before the British Association that to the same source we must look for the origin of gold. Mr. J. Logan Lolley, F.G.S., stated

—that while geological evidence is against its igneous origin, all the gold of all the rocks may have been derived from aqueous deposition; that, in fact, all this gold may have been deposited by marine action in the same way as the materials of the aqueous rocks themselves have been. And, moreover, our unaltered sedimentary rocks, even of tertiary age, may contain an equal amount of gold in proportion to their bulk with that of those altered or metamorphosed Cambrian and Silurian rocks, which have hitherto been regarded as the earth's great treasures of the precious metal. The knowledge now possessed of secondary and tertiary auriferous veins in California controverts the Plutonic as well as the palæozoic hypothesis, and the discovery of gold in sea-water and of its precipitation by organic matter alters the position of the question from that it occupied in the days of Murchison and Forbes. Since silica may combine with gold under heated conditions, and the silicate of gold so formed be soluble in hot water, as is also silica, gold in the form of silicate could be carried by water, heated by deep-seated conditions or by the neighbouring uprise of fused matter, from its original position, and be deposited in veins with silica itself when subsequent segregation would separate the silica of the silicate of gold and leave it as free gold mbedded in quartz as it is now found. The discovery by Sonstadt of nearly a grain of gold to the ton of sea-water shows that the sea has always held in solution an ample store to give to its sediments the amount of gold they are now found to contain, and Daintree's discovery of the power of organic matter is precipitate gold from a solution of the terchloride explains the deposition of gold from sea-water, since on the sea-bottoms there has always been a large amount of organic matter. Though the gold so deposited would be in infinitesimal proportion to the mass of the marine mineral sediments, it would be aggregated by nuclei of metallic sulphides by which it would be retained until thermal conditions favoured its conversion to a soluble silicate. The sulphide of iron, or pyrites, is known to nearly always contain gold, and hence it is to be concluded that the gold of the sedimentary rocks which have not been subjected to the favouring conditions for its separation and preservation in quartz veins is now in the metallic sulphides these rocks contain. In such rocks as the chalk and the London clay, the amount of pyrites is very great, and the author concluded by giving a rough estimate of what may be the amount of the gold now in the surface-rocks of the south-east of England, from which it appears that these deposits may contain gold to the value of £100,000,000 sterling.

The Chairman said that the prospect held out by Mr. Lobley was very encouraging, and he hoped that some one would be able to suggest how so much wealth could be rendered available. There was good ground for believing that gold deposits were gradually growing, and therefore for the present this enormous amount of gold might be left until it had aggregated into convenient nuggets. (Laughter.)

HILLCOUNTRY PLANTING REPORT.

THE DWARF MOUNTAIN BAMBOO AND ITS FLOWER—THE PATANA SWAMP BAMBOO—OTHER BAMBOOS—FLOWERING TREES—BO-TREES AND PLANTAINS AT HIGH ALTITUDES — TRAVELLING BY ROAD *VS.* RAILWAY—THE WEATHER.

The dwarf mountain bamboo, which forms so large a proportion of the undergrowth of the Ceylon forests, at and over 4,500 feet altitude, is in flower and seed here at present; and in reply to a letter from me Dr. Trimen states :—

"Your small mountain Bamboo is *Arundinaria debilis.* I think it flowers yearly as do many of the small species, whereas most of the largor kinds blossom and seed only at long intervals. The patana swamp one is *Arundinaria densifolia.* It is flowering and seeding profusely this year for the first time in my experience, and I cannot find that anyone has ever seen it in that state before."

It is not in accordance with my observation that the dwarf bamboo flowers annually: on the contrary, I remember tho late Mr. Wm. Ferguson being interested in the flowering and seeding of this species some years ago, as to him a novel circumstance and as enabling him to distinguish this bamboo from the other prevalent in our jungles, and of the long supple stems of which baskets, sieves, &c., are woven. Then as to the patana swamp or aquatic bamboo, I wrote very fully about its abundance and extreme beauty, as also its probable utility as a substitute for osiers, after a visit to Horton Plains in March 1888. Specimens brought away on that occasion are near me as I write, as perfect in tall elegance and fine foliage (though altered from green to yellow in colour) as when they were cut from the banks of the Belihuloya, at an altitude of 7,000 feet, on the occasion mentioned. I again visited the Plain in Nov. 1889 with a companion to whom I had descanted on the attraction which this bamboo added to the Maha Eliya expanses. In proportion was my mortification to find that the swamp bamboo had flowered and fruited, and that most of the tall, slim, beautiful stems had withered and were lying prostrate. This state of things I also fully described in a letter "from the Hills." The scene of desolation, although on a smaller scale in relation to space but especially as to size of plants, reminded me of my experience in South Wynaad in 1876, when I saw hundreds of thousands of large and tall stems of *Bambusa arundinacea*, which had flowered, seeded and died down, and of which I procured a large quantity of seed. Plants from that seed grew only too well at low altitudes, but here they have made but poor progress, except in sheltered ravines.

I should think Dr. Trimen will find that many of his correspondents in all parts of the world will be glad to have seeds of the specially elegant *Arundinaria densifolia.*

About two other plants which Dr. Trimen has been good enough to identify for me, he writes :—

"There is nothing to say of any general interest about the two mountain trees of which you send me specimens.

"A is the montane form of *Turpinia pomifera*, a common inhabitant of the hill forests. I did not know its young foliage was so brilliant; I suppose I do not happen to have seen it just at tho right time.

"B is *Pygeum Wightianum* (not a 'Weralu' but) called 'Ununu' by the Sinhalese, a name which enters into the composition of several place-names.

"Many trees 'flush' (as the tea-men say) with the first rains of each monsoon, and many also blossom twice in the year at the same times."

I wrote to Dr. Trimen respecting *T. pomifera*, because up here it vies with the iron-wood in splendour of colouring, tho tints of the flush shading from pink to scarlet and orange. From the *damba* and *kina* this tree differs, inasmuch as the whole of the foliage does not become coloured, but only masses of flush at the ends of twigs, which at a little distance assume the appearance of rich clusters of flowers, contrasted beautifully with the green of the glabrous leaves. On a portion of Lorne estate which was not burnt, some of these trees were left to grow separately, and having plenty of room and light, they are truly beautiful objects handsome in form and rich in contrasted colouring. Many ravines and dells in Nuwara Eliya are at present brightened with the warm red of the young foliage of this tree, the more welcome as the rhododendron trees at present scarcely show a flower.—*P. wightianum*, which I fancied might be a *symplocos* or a *weralu*, has been recently enriching the forests with an abundant wealth of spikes of white and fragrant flowers. It is quite worthy of being associated with the name of the great South India botanist, as famous in the south as Wallich was in the north, more than half-a-century ago, when the former was publishing his *Icones*, and the latter, having admitted that the Assam plant which he had ranked as a *camellia* was a true tea, was teaching botany to the students of the Calcutta Medical College, amongst them Loos and Dickman and Anthonisz and Wambeek from Ceylon.—Of course the well-known Oonoonagalla estate in Madulkele has derived its name from the prevalence of this tree in the forests which so long ago were felled to make room for such cultured plants as coffee, cinchona and tea. A young bo-tree has just been planted opposite the Nanuoya station. In loking at it, I doubted if it would grow at the alttude, but I now recollect that one of the first estates opened in the Dimbula District was Bogahawatte. The estate of Kehelwatte, close by, was, I suppose so named in consequence of the prevalence on its forest site of the wild plantains? How the opening of the railway has thrown once wellknown places and familiar names into the shade! How many of the present generation of Europeans in Ceylon know anything of the once frequently traversed Colombo-Kandy road? But much of the country can best be seen in the course of leisurely road drives.

This day, which opened so brghtly, continued sunny and hot until clouds gathered at eventide and we heard a distant rumble of thunder; but no rain fell, and there is every prospect of a fine day for our projected visit to Mr. Nock's mountain paradise under the hoary and precipitous brow of the lofty Hakgala,—the three peaks of which look towards the Central, Uva and Sabaragamuwa Provinces with loving regards.

COLD MORNINGS AND HOT DAYS—A TRIP TO HAKGALA—THE FERNERY—FLOWERS—POTATOES—A FINE VIEW OF UVA—FUTURE IMPROVEMENTS FURTHERED BY THE RAILWAY—RAIN WANTED.

NANUOYA, Nov. 12th.

"Hotter and hotter every day," with mornings cold in proportion, must be the meteorological record. Yesterday was a "blazing hot" day in Nuwara Eliya and Hakgala: a day which rendered the cooling effect of a drive through tho atmosphere grateful, and doubly so the dense shade and coolness of the beautiful "Fernery" at Hakgala. We cannot wonder at this being the favourite resort of visitors to the mountain Gardens; for, besides the wonderful collection of ferns, which Mr. Nock is engaged in classifying and naming, there is a great variety of allied plants, or plants which habitually indicate a preference for the shade into which we were glad to retire on this occasion, although we had been

charmed with the many beautiful or new vegetable and floral treasures arrayed on the parterres and in the borders of the open and prettily turfed expanses. To children a visit to these Gardens affords great enjoyment, and those who accompanied us had "such fun" in running round and round and hither and thither over the maze of narrow walks, on the sides of the ravine in which the Fernery is situated, and were so delighted with all the interesting and beautiful objects they saw, that they gave voice to the feeling of us "children of a larger growth," when they expressed reluctance to leave Hakgala. Mr. Nock, as usual, had many plants, new or newly in flower, ornamental and useful, to which to direct our attention; and not the least interesting "exhibit" was a plot of potatoes, wonderfully prolific and healthy, although the fourth successive crop was being grown in the same ground. I could speak of our admiration of roses, camellias, begonias, tree daisies and other things of beauty, but the place must be visited to get an idea of its beauty, and on a day such as we enjoyed, to realize the grandeur of the view of the vast spreading valley of Uva, with its rice fields, its patana hills and forested mountains and the majesty of the precipitous face of sheer rock which rises over the Gardens. We saw interesting photographs of the views from some points, but not of a size to do justice to the massiveness of the mountain or the extent of the prospects. The sight of the enormous proportion of grassy prairies in Uva cannot but raise questions as to the possibility of improving the pasturage in some cases, of culture of useful food or fibrous products in others, and of considerable afforestment in suitable situations. We cannot doubt that much of this is in the future, progress—material, intellectual and spiritual—being indefinitely furthered by the railway over which trains laden with passengers and the exchanges of a profitable commerce will soon be entering the ancient Principality of Uva and awakening its echoes to the sounds of a new dispensation.

This morning here is no exception to the sunny brightness and perfect calm of the openings of previous days, and but for a mass of moist looking haze up towards the table-land between Totapala and Pidurutalagala, we should feel inclined to predict a continuance of the present brilliant weather. Mr. Nock on the Uva side, like others on this side who are putting out plants, would be glad of a little rain. Our thermometer went down to 52° in the very early hours of this morning, but all the signs point to a sun heat today represented by not far from three times that figure.

SUPPLY BASKETS AND THEIR VALUE IN TRANSPORTING—SUCCESS OF EUCALYPTS &C.—PEPPER IN CEYLON—THE WEATHER.

NANUOYA, Nov. 12th.

Yesterday, when *en route* to Nuwara Eliya, we came upon a gang of coolies, eight in number, carrying loads, each made up of several hundreds of funnel-shaped supply baskets, packed one into the other in long rolls. The baskets had probably come from Kalutara to Nanuoya by train, and we naturally speculated on their destination. With a good deal of probability, considering the extensive failure in planting after the ordinary fashion in the partially cleared forests below Nuwara Eliya, we credited the consignment to the local forest officers. In any case it would seem that it would be better for foresters and planters to incur the cost of such baskets, where sections of bamboo, or other substitutes, are not available, than to lose, as is so frequently the case, plants put out, which have cost so much in the shape of purchase of seed and labour expended on nurseries. Plants differ very much in sensitiveness to the effect of transplanting. Tea does well when put out at an early stage of growth and I believe better when of an age which renders "stumping" necessary. Frenelas, on the other hand, succeed as seedlings, but "insidious defunction" is the rule with plants above half a foot in height. Many of the Australian eucalypts, too, die from the effects of transplanting. No wonder though the grevilleas are such favourites: not only are they amongst the most free-growing and beautiful of trees, but the plants put out in anything like decent weather practically all succeed. That is in the hill and mountain regions, for of white toons and grevilleas recently sent to a low-country estate the report is that fully 80 per cent of the toons have succeeded, while 95 per cent of the grevilleas perished. The fact is probably significant of the zones in which each will best flourish, although I have seen some fine specimens of grevillea and also of Norfolk Island pine at Colombo.

The mention of the lowcountry estate in which I am interested reminds me of "Peppercorn's" recent allusion to the comparative failure of the plant from the fruit of which that clever writer has derived his *nom de plume*. Our climate in the south-west of Ceylon bears so much of general resemblance to that of Malabar, where some of the best pepper in the world is grown, that many of us thought that the vine ought to grow well and be fruitful of its special spice with us. In my own case I had encouragement in the shape of groves of jak trees in native gardens near my land, which were certainly not grown merely as ornamental creepers. I have, therefore, grown the vines to some extent on trees and on rocks, and in both cases, there has been no failure in luxuriant growth. But fruit has not been in proportion, and of the small quantities of peppercorns yielded, my native neighbours have for two successive years helped themselves pretty liberally. The effect of turning the tops of the plants downwards, of pruning and of watching will be tried before the experiment is abandoned; but I have a considerable degree of fear that pepper must be added to Liberian coffee, cacao, indiarubber trees and manioca as cultivation of a non-paying nature, in the locality where tea and coconuts flourish.

November 13th.

The fine weather remains unbroken, although the sky clouded over and there was an attempt to rain yesterday. The light, cool breeze we get is steadily from the north-east; and this clear, cold but sunny morning does not certainly indicate the proximity of rain. All we knew of *your* great rainstorm up here was the appearance of a mass of darkness far in the west and far below us, which led to the exclamation, "They are having heavy rain at Colombo." This being the last working day before the Tivali, extra pluckers have been crowded on to save the abundant tea flush. Another will be well on before steady work is resumed, we fear.

AFFORESTATION—AUSTRALIAN TIMBER TREES—USEFUL JAPAN TIMBERS—RICE CULTIVATION IN CEYLON.

NANUOYA, Nov. 12th.

In writing this morning about our yesterday's delightful trip to Hakgala and of the vast expanses of patana visible in Uva I mentioned the afforestation of portions of those patanas as desirable. Amongst the most barren portions of our patanas are those the soil of which consists mainly of ironstone. Now it is in soil of this nature in Western Australia that two of the best of the eucalypts flourish and bear timber of the best quality. I refer to the JARRAH (*E. marginata*) and the KARRI (*E. diversicolor*). Those trees and others ought, therefore, to be tried on such soils,

good-sized holes being of course dug for the reception of the plants or seed, and time for thorough æration being allowed before the seedlings or the seeds are deposited. The fact I have mentioned of specially fine timber trees growing best on hard ironstone soil has been stated by Baron Von Mueller and other writers on Australian trees, and has been repeated by the author of a paper on some of the leading Australian timbers written for the Institution of Civil Engineers in 1887, and to which Mr. Walter Tringham has been good enough to draw my attention. Mr. Chamier, M. I. C. E., the writer in question, gives a fair account of the conflicting testimony as to the power of jarrah to resist the attacks of the white-ant and *teredo navalis.* It seems to be certain that jarrah is one of the best wood for jetties and for many other purposes. Those purposes do not include its use as firewood, however; for Baron Von Mueller dwells on its non-inflammability as its great merit for roof shingles. The cost of working some of the best Australian timbers is great, on account of their weight and extreme hardness. But such qualities add to their value as sources of hard wood sleepers for railways. In this purpose, however, karri and red gum (*E rostrata*) timber seems superior to that of jarrah. It is interesting to learn from Mr. Chamier that he accompanied the late Mr. W. T. Doyne (the first Chief Engineer of the Colombo-Kandy railway) on an official visit to Western Australia for the purpose of reporting on harbour improvements when the magnificent jarrah forests and their utilization were reported on by Mr. Doyne. But the Government contented itself by according liberal encouragement to private enterprise. The export is considerable, and the demand in advance of supply. On the estate whence I write, as I lately mentioned, we have found this fine tree by no means a slow grower, and specimens of this eucalypt and of *E. robusta* are amongst our finest trees. The timber of the jarrah, like all others, would be more valuable and appreciated, if it were well seasoned. *Karri,* which grows to the size of 300 to 400 feet, resembles jarrah, but is not so red in colour. Its transverse strength is superior and it can be obtained in pieces of enormous size. Red gum (*E. rostrata*) differs from jarrah and karri, in preferring moist situations and yet its timber is of the very best quality, and is a special favourite for railway sleepers. This is the tree to grow beside streams or in swamps. Next to red gum Mr. Chamier classes the various iron barks, *E. siderophloia,* found mainly in New South Wales and Queensland. Its timber is one of the hardest and stronges t in existence. But it is of such slow growth that it may not be so suitable as many of its congeners for cultivation in Ceylon. The next tree mentioned by the writer is the world-famous blue gum (*E. globulus*), which grows rapidly enough in Ceylon and can be coppiced for firewood, but it seems to flourish in many other countries, the Cape, Algeria and even Italy, better than in many parts of our island. The timber is good, but, unless well seasoned, is apt to warp and shrn k. Mr. Chamier's list closes with stringy bark (*E. obliqua*). This, with *E. gigantea* and *E. capitellata,* yields the bulk of the "hard wood" used in Australia, useful for a large number of purposes, although not equal to those trees previously noticed.

In the same volume of the Proceedings of the Institution of Civil Engineers is a paper on useful Japan timbers, by Mr. J H. T. Turner, Assoc. M. I. C. E. The writer states :—"Of the 120 kinds of Japanese timber catalogued by the late Dr. Gesto, in the transactions of the Asiatic Society of Japan, the six following have been selected for notice, as those which chiefly concern the builder, namely Shira, Kashi, Keyaki, Aku Matsu, Kuro Matsu, Hinoki, and Sugi." The last-named is the so-called cedar, *Cryptomeria japonica,* of the timber of which most of the tea boxes used in Ceylon are made. Of "Momi," which is advertised as preferable, in being destitute of odour, I find no mention. The shooks we get here are composed entirely of Sugi wood, which is just a superior kind of deal, occasionally prettily marked with wavy shadings, so that I cannot doubt its looking well as furniture or wainscoting, if polished and varnished. But neither when I have stood close to the carpenters when they were planing and fitting the pieces have I observed any marked odour, nor have we ever had complaint of its affecting the tea through the lead lining. The tree, *C. japonica,* is very largely and successfully grown in and around Nuwara Eliya and personally I have readily invested in a pound of the seed advertised by Messrs. Mackwood at so moderate a price. Apart from our own experience of this handsome, araucaria-like tree, the sight of some fine specimens, well-grown at an early age, in the Hakgala Gardens yesterday quite reassured us of this being a good tree to grow. So, we should think must be the very handsome *Pinus sinensis,* resembling considerably in foliage that king of pines, the *Pinus longifolia* of the Himalayas, with its copious bunches of foliage consisiting of spines so long and elastic as to look like masses of green hair. Mr. Nock is growing some other pines, including *Pinus canariensis.* The sugi, or *Cryptomeria japonica,* may not yield a first-class timber ; but it is useful and easily wrought, and, although last on Mr. Turner's list, it stands well with us for readiness of growth and beauty of form. Specimens of a little over four years old in Nuwara Eliya are over 20 feet high, although they have put on abundance of lateral branches from the root upwards. The timber is useful for house work as well as for tea boxes and like purposes, Mr. Turner describes Keyaki as the most important of his group. Its scientific name is *Zelkova Keaki.* The wood is light brown, strong and durable, handsomely marked and takes a fine polish, so that it is valued for furniture. This tree ought, if possible, to be introduced into Ceylon. The Shira Kashi is an oak, (*Quercus glauca*), and, therefore, not likely to be successful here. The *Aka Matsu* or Me Matsu or Red Pine (*Pinus densiflora*) seems a very useful tree equally good for house building and all kinds of carpentery. This tree ought, also, to be tried in Ceylon. So also, ought the Kuro Matsu or O-Matsu (*Pinus Thunbergii*), the common timber of the Japan hill forests. Still more valuable, apparently, is the Hinoki (*Chaecypario obtusa*), good for house construction, railway sleepers and cabinet work.—In Japan, as in many other countries, the trees are cut at too early an age and the timber is very imperfectly seasoned. The proper cutting age of the trees named varies from 30 to 50 years, but there can be little doubt that in our climate maturity will be attained at half the periods required in Japan. Many of the trees good for timber at an advanced age must be useful for fuel at much early periods of their existence, a good proportion coppicing freely. *Cryptomeria japonica,* we cannot doubt, will coppice well, seeing that it can be easily propagated from cuttings. This we know from experience as well as from books. Mr. Turner mentions that in Japan "neglect of seasoning is seldom aggravated by the use of paint of any kind, but it is not unusual to stain wood with shibu (the juice of persimmon) darkened with lamp black or ashes. Shibu is a powerful astringent, and does not hinder the sap from leaving the green timber, whilst it affords some protection from the weather." We suppose most of our readers are aware that lime in moderate

quantity is useful, placed in water where logs of timber are seasoned; and that, applied in quantity and directly, it gives a dark hue to the lightest coloured wood.

I have read with interest and pleasure the very able letter, signed "A.," on Rice Culture in Ceylon, proving that whatever the force of the sentiment of regard for "patrimonial inheritance" may be, it cannot possibly account for thousands of persons, year after year, being willing, or, even if they were willing, being able to continue an unremunerative pursuit. Rice-growing must certainly be remunerative, according to the native standard of profit, or it would not be persevered in. As the writer points out, if the returns are not such as might be obtained by superior modes of cultivation, the pursuit suits native idiosyncracy, because, if the results are moderate, so is the amount of physical labour necessary to obtain them: a few weeks of exceptional work and then months of the dearly loved *dolce far niente*. The late Mr. James de Alwis went the length of saying that Europeans often did injustice to native cultivators from ignorance of their habits. "Ye are idle! ye are idle!" has been said of them when observed sleeping during the day hours, by persons who knew not that the preceding night had been spent in labour on the fields. And it is a fact that I have personally seen the Jaffna cultivators busy raising water from wells and irrigating their fields on moonlight nights. The natives can work hard and continuously, occasionally, so as by the results of such labour spurt to secure the luxury of absolute idleness for lengthened periods. This, in a pursuit which is ordinarily remunerative, or it would be abandoned. But there can be no question that with steady industry applied to improved modes of culture, the pursuit would be far more remunerative and the condition of the cultivators far better and happier than is at present the case. That is, if to steady industry in improved cultivation, provident habits were added. The object of the School of Agriculture and its *alumni*, the "Agricultural Instructors," scattered over the country, and of gentlemen like Mr. Elliott, is to teach the people to increase the produce of their lands by improved methods of agriculture and by steady instead of spasmodic work, and also to inculcate such provident habits as saving seed-paddy from the proceeds of harvest, instead of paying, as many of them do, 50 per cent per crop season for its supply. If the landlord supplies the seed and receives it back with 50 per cent added, it will be acknowledged that this is unjust to the labourer, whose share is in proportion lessened. But in most cases the seed-paddy is supplied by outsiders, who also lend money for exorbitant interest on the mortgage of lands. This it is, the going into debt to usurious money-landers, which weighs down the cultivators here as in India, and which in the latter country has induced Government to pass exceptional laws, providing that in no case can the laud be alienated, and arranging a system of money advances by Government to the cultivators at moderate interest, a system which our Government might well imitate. For the rates of interest charged by ordinary moneylenders are generally excessive and ruinous. In a large number of the cases of experimental land settlement by Mr. J. H. de Saram, the lands were mortgaged, in most instances to members of the "great unpaid" class, for sums on which 16½ per cent interest (why the odd fraction?) had to be paid. How can any ordinary enterprise bear such a rate, or the much higher rates which I believe are in many cases exacted! While, therefore, it is certain that paddy cultivation pays fair returns, or it would be abandoned, it has to bear burdens compared to which the Government rent of less than 10 per cent is as nothing. The efforts of those who are labouring in a legitimate manner to improve the condition and lighten the self-imposed burdens of the goyiyas are, therefore, worthy of all encouragement and praise.

MOISTURE ON PLANTS MISTAKEN FOR DEW—FROST AND TEMPERATURE AT NUWARA ELIYA—THE DEPOSITION OF DEW—MIST EQUIVALENT TO RAIN—EFFECT OF DUST IN THE ATMOSPHERE—THE MIST LINE AND COFFEE—MIST AND HEALTH—FIGS—FINE WEATHER.

NANUOYA, Nov. 14th.

Now that the season is approaching, has indeed arrived, when, according to the popular conundrum, the moisture which ascended from the earth for *sun-dry* reasons will descend in *dew* (due) time, Dr. Macpherson's article in *Longman's Magazine*, embodying the results of the very interesting experiments by Mr. Aitken, F. R. S., of Falkirk, possesses special interest. It seems that moisture on plants, which for centuries has been mistaken for dew, is really exuded from the leaves by an amount of reserve energy in the roots, which in the case of healthy vegetation acts with a force quite remarkable. That the leaves of plants exuded moisture, especially when exposed to sunlight, has been long known, and the process was described by Boussingault in the case of mint. What Mr. Aitken has established, besides measuring the force with which the roots act, is that the moisture excreted from the leaves of grass and other plants in a healthy condition takes invariably the form of a drop (what in Scotland we call a blob) resting on the extremity of the leaf, and that such false dew exists when true dew, for which it has constantly been mistaken, is entirely absent. We have all been in the habit of crediting the atmosphere with depositing condensed moisture, when in reality, the moisture has come from the earth and has been forced up the stems of plants and out through the pores of healthy leaves by a species of energy even more remarkable than that which enables some forms of mushrooms to upheave not only superincumbent earth but even heavy masses of stone. Dead or withered leaves never show this excreted moisture, but they can be "wet with the dews of the night;" with moisture diffused over their whole surface. So with healthy leaves: in addition to the *drops* of excreted moisture at their points, their whole surface, and specially their lower surforces, can be renderd diffusively moist by true dew, which is *always* evaporated from the earth, that earth being ever warmer than the air in contact with it. If plants or stones or any substance on the earth's surface have been rendered cold, or rather have been deprived of their warmth by the radiation of heat into space, the moisture coming warm from the earth is condensed ou such cold objects, especially on their undersides; the dew, in a very low temperature, taking the beautiful form of rime or hoar-frost. This is the explanation of the snow-white appearance so frequently assumed on cold, clear nights and mornings by the grassy plains of Nuwara Eliya, in the winter months of November, December, January, February, and March, —the cold, or rather the abstraction of heat, being there intensified by the evaporation of swamp moisture as well as the radiation of heat. In February and March the mean nocturnal temperature at our Sanatorium is 7 deg. below the mean shade temperature: that is the mean nightly temperatures for those months is 50 deg. and 51 deg., against

57 deg. and 58 deg. mean shade temperature. But on exceptional nights the temperature goes down to freezing point. For instance, in January and December 1889, the minimum nocturnal temperature went so low as 32 deg.; in February 33 deg.; in November 33 deg. 3; and in March 34 deg. Coffee trees growing in swamps, at elevations far below that of Nuwara Eliya, were sometimes blighted ("killed by frost" was the popular idea) in very clear cold weather. Of course the injury arose from air near the ground chilled by the combined effects of evaporation of moisture and radiation of heat into space. There can be cold at night and in the early mornings, intense enough to injure vegetation, without the presence of actual frost. But to return to Mr. Aitken's conclusions regarding dew. It will be obvious that dew, owing its origin always to the earth, as he has proved, is not always condensed by plants or other objects near the surface. Much of it occasionally ascends into the atmosphere, until it meets with strata cold enough to condense its minute particles. It then
... back to the earth whence it arose, if there is a
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ERRATA.—On page 452, 2nd column, last line of subheadings, "FIGS" should be "FOGS." On page 453, 1st column, line 25, for "added" read "*eddied*," and in line 34, "subjects" should be "*objects*."

has been conden...
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I have correctly represented the main results of Mr. Aitken's interesting experiments as embodied in Dr. Macpherson's paper; but the paper is so interesting and in some aspects so important, that I trust you may be able to reproduce it in its entirety. In any case I cannot deny myself the pleasure of quoting the concluding paragraph, in which the scientific facts are clothed with the language of poetry, thus:—

These two facts, then, have now been established: that what was long considered to be dew is merely the exudation of vigorous plants, and that true dew rises from the ground. Brilliant globules are produced by the vital action of the plant—the liquid being the *elixir vitæ* of vegetation—showing life in one of the most charming forms in the phenomena of nature, especially when the deep-red setting sun makes them glisten all a-tremble with gold light; while an infinite number of minute but glistening particles of moisture bedeck the blade-surfaces in the form of gentle dew, which has risen in water-vapour from the warm bosom of Mother Earth, to rerfesh the thirsty plants and diffuse fragrance all around.

I wish I knew as much about one of the earliest meteorological phenomena mentioned in the sacred record,—the "mist" which "arises out of the ground" in a moist state of the earth, as, by means of the paper referred to, I now do about the dew, which is peculiar to weather in which the atmosphere contains the minimum of moisture. In Nuwara Eliya, for instance, rain and mist prevail in June, when the average mean relative humidity is represented by so high a figure as 95 deg.; dew, in its frozen state, giving hoar-frost in Feb.; the average humidity of which month is so low as 73 deg. Mr. Blanford in his valuable work on the weather and climates of India and Ceylon is less satisfactory in dealing with haze and fog, than in any other department of the work. He does not seem to have studied the phenomenon of mist in mountain regions, such as that whence I write, and where for days together sometimes the sky is darkened by dense vapour at and above 5,000 feet altitude, while brilliant sunlight prevails below the limit mentioned. While dew is condensed by cold, it would seem as if heat were the agent required to dissipate fog or mist. And yet there is a haze which owes its origin to heat. I always feel that above 5,000 feet here the prevalence of mists should count a good deal in qualification of our comparatively limited annual rainfall of 90 inches. That quantity must be equivalent to over 100 inches where mist does not prevail? Why does it prevail, and why is it occasionally so unpleasantly persistent, and why is mist-moisture not rapidly condensed and precipitated by the cold of the atmosphere, as dew vapour is? For above the mist line the temperature is appreciably colder than at the lower altitude, where, if mist does form, it soon "lifts" or is dissipated. But for dust in the atmosphere, we are told, rain
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...e every material thing including the interiors
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...ord does not help me with answers to such
...ions, except as answers may be found in terms
...ief as the following, under the heading "Fog":—
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...ir at different temperatures, and both completely
...rged with invisible vapour, when intermingled,
... no longer hold the whole quantity in suspension;
... excess must therefore be deposited as fog." But
... diffused particles of moisture which constitute
... are surely not deposited? They sometimes
...main suspended in the atmosphere for days. The Rev. Joseph Burnet, a very careful observer, mentioned to me the curious fact that the line of prevalent mist and of connected success in coffee culture in the Matale districts of our hill region was found to be 4,500 feet. Here the line is about 5,000 feet, and on the eastern side of the mountain system it is higher still, coffee having flourished at 5,500 in Haputale. Except in cases of bronchial affections, misty weather does not seem to be insalubrious, but on the contrary healthier than hot, bright, dry weather. It is a popular belief that, as mountains are denuded of forest, mist will disappear, but my experience does not confirm this belief. It seems mainly a question of altitude and, no doubt, of temperature of the air as the result of altitude. In cold, north-east monsoon weather, however, we often look down from our clear heights on lower ranges and valleys enveloped in a sea of white mist, I have no meteorological work at hand to refer to, except Blanford's, and the Penny Cyclopedia is now somewhat ancient. Still the following seems worthy of quotation:—"Mist. The vapour of water, when mixed with air of the same or a higher temperature, is invisible; but when the temperature of the air is reduced below that of the vapour, the vapour becomes visible and forms a mist. * * It has been found that the quantity of vapour in the air diminishes nearly uniformly with the temperature, from the equator to the poles. But as the quantity of vapour which the air will hold at any given temperature is limited, whenever that quantity is at or near the point of saturation, a very small reduction of temperature renders the air misty, and a further reduction converts the vapour into rain."

quantity is useful, placed in water where logs of timber are seasoned; and that, applied in quantity and directly, it gives a dark hue to the lightest coloured wood.

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MOISTURE ON PLANTS MISTAKEN FOR DEW—FROST AND TEMPERATURE AT NUWARA ELIYA—THE DEPOSITION OF DEW—MIST EQUIVALENT TO RAIN—EFFECT OF DUST IN THE ATMOSPHERE—THE MIST LINE AND COFFEE—MIST AND HEALTH—FIGS—FINE WEATHER.

NANUOYA, Nov. 14th.

Now that the season is approaching, has indeed arrived, when, according to the popular conundrum, the moisture which ascended from the earth for *sun-dry* reasons will descend in *dew* (due) time, Dr. Macpherson's article in *Longman's Magazine*, em[illegible] the results of the very interesting ex-pe[illegible] po[illegible] on[illegible] for[illegible] an[illegible] the[illegible] qu[illegible] ud[illegible] ha[illegible] cri[illegible] W[illegible] in[illegible] m[illegible] ot[illegible] ab[illegible] ca[illegible] and that such false dew exists when [illegible], for which it has constantly been mistaken, is entirely absent. We have all been in the habit of crediting the atmosphere with depositing condensed moisture, when in reality, the moisture has come from the earth and has been forced up the stems of plants and out through the pores of healthy leaves by a species of energy even more remarkable than that which enables some forms of mushrooms to upheave not only superincumbent earth but even heavy masses of stone. Dead or withered leaves never show this excreted moisture, but they can be "wet with the dews of the night;" with moisture diffused over their whole surface. So with healthy leaves: in addition to the *drops* of excreted moisture at their points, their whole surface, and specially their lower surfaces, can be renderd diffusively moist by true dew, which is *always* evaporated from the earth, that earth being ever warmer than the air in contact with it. If plants or stones or any substance on the earth's surface have been rendered cold, or rather have been deprived of their warmth by the radiation of heat into space, the moisture coming warm from the earth is condensed on such cold objects, especially on their undersides; the dew, in a very low temperature, taking the beautiful form of rime or hoar-frost. This is the explanation of the snow-white appearance so frequently assumed on cold, clear nights and mornings by the grassy plains of Nuwara Eliya, in the winter months of November, December, January, February, and March,—the cold, or rather the abstraction of heat, being there intensified by the evaporation of swamp moisture as well as the radiation of heat. In February and March the mean nocturnal temperature at our Sanatorium is 7 deg. below the mean shade temperature: that is the mean nightly temperatures for those months is 50 deg. and 51 deg., against

57 deg. and 58 deg. mean shade temperature. But on exceptional nights the temperature goes down to freezing point. For instance, in January and December 1889, the minimum nocturnal temperature went so low as 32 deg.; in February 33 deg.; in November 33 deg. 3; and in March 34 deg. Coffee trees growing in swamps, at elevations far below that of Nuwara Eliya, were sometimes blighted ("killed by frost" was the popular idea) in very clear cold weather. Of course the injury arose from air near the ground chilled by the combined effects of evaporation of moisture and radiation of heat into space. There can be cold at night and in the early mornings, intense enough to injure vegetation, without the presence of actual frost. But to return to Mr. Aitken's conclusions regarding dew. It will be obvious that dew, owing its origin always to the earth, as he has proved, is not always condensed by plants or other objects near the surface. Much of it occasionally ascends into the atmosphere, until it meets with strata cold enough to condense its minute particles. It then falls back to the earth whence it arose, if there is a calm; but if wind is blowing it may be carried and added so as to fall on surfaces so hard and dry, that obviously from them no moisture could be derived. This is the explanation of dew on arid ground and on rocks which possess no moisture or none near their surface. It follows from all that has been stated, that, unless we carefully observe and distinguish, we may be deceived by leaf-excreted moisture into assuming the presence of dew when it is absent. But I submit that when we see such subjects as spiders' webs of the most beautiful and elaborate geometrical forms made conspicuous in every detail by means of diamond-like reflections of sunlight from copious moisture on every filmy thread, we cannot be mistaken as to the existence of genuine dew which has been condensed near the surface of the earth or in one of "the fields of upper air." I believe I have correctly represented the main results of Mr. Aitken's interesting experiments as embodied in Dr. Macpherson's paper; but the paper is so interesting and in some aspects so important, that I trust you may be able to reproduce it in its entirety. In any case I cannot deny myself the pleasure of quoting the concluding paragraph, in which the scientific facts are clothed with the language of poetry, thus:—

These two facts, then, have now been established: that what was long considered to be dew is merely the exudation of vigorous plants, and that true dew rises from the ground. Brilliant globules are produced by the vital action of the plant—the liquid being the *elixir vitæ* of vegetation—showing life in one of the most charming forms in the phenomena of nature, especially when the deep-red setting sun makes them glisten all a-tremble with gold light; while an infinite number of minute but glistening particles of moisture bedeck the blade-surfaces in the form of gentle dew, which has risen in water-vapour from the warm bosom of Mother Earth, to refresh the thirsty plants and diffuse fragrance all around.

I wish I knew as much about one of the earliest meteorological phenomena mentioned in the sacred record,—the "mist" which "arises out of the ground" in a moist state of the earth, as, by means of the paper referred to, I now do about the dew, which is peculiar to weather in which the atmosphere contains the minimum of moisture. In Nuwara Eliya, for instance, rain and mist prevail in June, when the average mean relative humidity is represented by so high a figure as 95 deg.; dew, in its frozen state, giving hoar-frost in Feb.; the average humidity of which month is so low as 73 deg. Mr. Blanford in his valuable work on the weather and climates of India and Ceylon is less satisfactory in dealing with haze and fog, than in any other department of the work. He does not seem to have studied the phenomenon of mist in mountain regions, such as that whence I write, and where for days together sometimes the sky is darkened by dense vapour at and above 5,000 feet altitude, while brilliant sunlight prevails below the limit mentioned. While dew is condensed by cold, it would seem as if heat were the agent required to dissipate fog or mist. And yet there is a haze which owes its origin to heat. I always feel that above 5,000 feet here the prevalence of mists should count a good deal in qualification of our comparatively limited annual rainfall of 90 inches. That quantity must be equivalent to over 100 inches where mist does not prevail? Why does it prevail, and why is it occasionally so unpleasantly persistent, and why is mist-moisture not rapidly condensed and precipitated by the cold of the atmosphere, as dew vapour is? For above the mist line the temperature is appreciably colder than at the lower altitude, where, if mist does form, it soon "lifts" or is dissipated. But for dust in the atmosphere, we are told, rain would not resolve itself into drops, but would saturate every material thing including the interiors of dwellings as much as their exteriors. In that case does the absence of dust at high altitudes account for the frequent prevalence of the pervasive form of moisture known as fog or mist? Blanford does not help me with answers to such questions, except as answers may be found in terms so brief as the following, under the heading "Fog":—"It is a well known physical fact that two masses of air at different temperatures, and both completely charged with invisible vapour, when intermingled, can no longer hold the whole quantity in suspension; the excess must therefore be deposited as fog." But the diffused particles of moisture which constitute fog are surely not deposited? They sometimes remain suspended in the atmosphere for days. The Rev. Joseph Burnet, a very careful observer, mentioned to me the curious fact that the line of prevalent mist and of connected success in coffee culture in the Matale districts of our hill region was found to be 4,500 feet. Here the line is about 5,000 feet, and on the eastern side of the mountain system it is higher still, coffee having flourished at 5,500 in Haputale. Except in cases of bronchial affections, misty weather does not seem to be insalubrious, but on the contrary healthier than hot, bright, dry weather. It is a popular belief that, as mountains are denuded of forest, mist will disappear, but my experience does not confirm this belief. It seems mainly a question of altitude and, no doubt, of temperature of the air as the result of altitude. In cold, north-east monsoon weather, however, we often look down from our clear heights on lower ranges and valleys enveloped in a sea of white mist, I have no meteorological work at hand to refer to, except Blanford's, and the Penny Cyclopedia is now somewhat ancient. Still the following seems worthy of quotation:—"Mist. The vapour of water, when mixed with air of the same or a higher temperature, is invisible; but when the temperature of the air is reduced below that of the vapour, the vapour becomes visible and forms a mist. * * It has been found that the quantity of vapour in the air diminishes nearly uniformly with the temperature, from the equator to the poles. But as the quantity of vapour which the air will hold at any given temperature is limited, whenever that quantity is at or near the point of saturation, a very small reduction of temperature renders the air misty, and a further reduction converts the vapour into rain."

According to my observation the mists to which we are subject up here are not often condensed into rain *in situ*. They are generally raised into the higher atmosphere, to be there, no doubt, brought into contact with strata of cold air or frozen moisture, by which they are condensed and sent earthwards again in the shape of rain-drops?

Fogs have their own merits. Some of these are noticed by Hartwig in "The Aerial World," thus:—"By preventing nocturnal radiation into space, they prevent many a tender plant from being nipped" by cold. Misty weather is also, no doubt, favourable to success of transplanting operations. On the other hand, the change to such weather as we are now enjoying is delightful, not only for its cheerful influences generally, but for the impulse it gives to flowering as well as flushing. The wealth of blossom now out is wonderful, the rose bushes being especially glorious in abundance of buds and flowers, in richness of colour and in many cases in exquisite odour. "Now is the winter of our discontent made glorious summer."

Your goodnature must have been in the ascendant, when you admitted so much controversy about a matter so plain as that a man pursuing a squirrel which he never overtakes cannot possibly go round the animal. Someone will next ask if two parallel lines cannot meet. Whatever possessed Vantosky Renton, the philological and poetical, to father the proposition of a (pseudo) "scientific friend" that a man who goes in a circle always with his face one way and who never gyrates "turns on his axis"? I feel inclined to join the Bengalee Baboo, who execrated Sir George Campbell's *cui bono*! That for the mock scientist. As for the true poet, to him, even in his association with a strange bedfellow, I say:—

"While terra firma on its axis,
Diurnal turns,
Believe me, both in faith and practice,
Yours, ——."

The propounder of the self-solving riddle has the merit of having done justice to the agility of the squirrel, however. There is one beside me as I write. Not Miss Jewsbery's "little mime and thief" of the Colombo coconut topes, which he makes musical with his metallic notes; but a grey mountain squirrel, with a long-spotted tail. To this appendage he evidently attaches much importance, dressing it carefully when he so funnily and with such care performs his toilet. He is such a dear affectionate little pet: a greatly improved edition of a monkey, with his pretty hands and his flesh-coloured nose. When awake he is incessantly in motion, and when inclined to sleep he curls himself up and wraps his tail around him. A bit of a Huntley & Palmer's biscuit gains his heart, and in an empty biscuit tin in his cage he frequently indulges his nest building instinct, packing it full of straw and then attempting to pack himself into it. When a finger is presented to him, he nibbles at it and pretends to bite, but he never does so. The case is very different with his neighbour, an Australian parrot of brilliant plumage. *He* likes to have his neck scratched and his head stroked, but in the midst of a purring noise by which he expresses his pleasure he gets tired, and then he makes no pretence of biting, but uses his nutcracker beak with emphasis. When the squirrel first came and received attention, the parrot rushed between with jealousy and anger, and now he often clings to the bars of the cage and attempts to catch the squirrel, vain attempts which the animal seems to enjoy. Indeed I think the parrot himself is actuated by the sense of fun, for, although in our quadrangle he plays amicably with the Australian magpie, he posts himself at the door of this bird's cage to prevent access, biting at the long legs of the "magpie." The latter, instead of using his sharp bill, takes the parrot's action all in good part.

To pass from birds to snakes, it would be very interesting to know if the snake mentioned by Mr. M. H. Thomas, which projected its venom into the Madras officer's eye, was able to do so by voluntary muscular effort, or whether, in the effort to strike, its head did not come in contact with some object which led to the spurting away of the poison? My inclination is still to doubt the power of projection. That the deadly reptiles should be provided with apparatus most efficient for the purpose of injecting a deadly fluid, seems mystery enough.

"TEA-PLANTING IN CEYLON."

Twelve Views "with the Season's Greeting from Ceylon."

Messrs. H. W. Cave & Co.'s Christmas booklet is an extremely neat production, the cover with its coloured picture of Lanka's coast, fishing-boats and palm trees which has been engraved and printed here, being fully worthy of the twelve Views (from photographs of the late Mr. M. H. Clerke of Effindale estate,) reproduced at home. The price being so low as two rupees a copy, there is sure to be a great run upon this most attractive Christmas gift. The Views include:—'General View of Estate, Bungalow and Factory, Tea Nursery, Pruning, Plucking, Weighing-in, Withering, Firing, Sorting, Sifting, Packing, Shipping.' A nicer X'mas gift from Ceylon to friends at home there could not be; and if accompanied with a few lb. of good Ceylon tea, all the better. Happy thought: let our tea dealers buy up the edition from Messrs. H. W. Cave & Co. to distribute with their packets!

SCOTTISH TRUST AND LOAN CO. OF CEYLON.

The thirteenth annual meeting of the Scottish Trust and Loan Company of Ceylon was held yesterday in Edinburgh—Mr. Henry Johnston, advocate, presiding. The report showed a credit balance of £5,925, of which the directors proposed to write off a loss of £3,000 on estates. A dividend of 5 per cent was recommended. The report was approved. Mr. F. A. Bringloe, C.A., was appointed secretary in place of Mr. J. C. Penney retired.—*Glasgow Herald*, Oct. 25th.

NOTES ON PRODUCE AND FINANCE.

Controlling the Supplies.—As a result of the action lately taken by the Brokers' Association, it is satisfactory to note that the supplies of Indian tea, although pretty heavy are not in excess of the quantity the dealers are able to cope with. It is to be hoped that importers, in their own interests as well as those of the whole trade, will use every endeavour to support, as far as is practicable, the efforts of their representatives in the "Lane."

Testimonial to Mr. James Taylor.—Acting in accord with The Ceylon Planters' Association, the Executive Committee of the Ceylon Association in London has appointed Messrs. J. Whittall, H. K. Rutherford, J. L. Shand, and Wm. Martin Leake as a sub-committee to collect funds at home for a proposed testimonial to Mr. James Taylor, of Loolecondura Estate, who has played so important a part in the introduction and cultivation of tea in Ceylon. In 1862 the first considerable experiment in the

practical cultivation of cinchona in Ceylon was entrusted to Mr. Taylor. And so successfully was it conducted that in the year 1885-86 upwards of 15,000,000 lb. of bark were exported from Ceylon. In 1866 Mr. Taylor began making experiments in the manufacture of tea with leaves growing on bushes in the gardens of Loolecondura and Waloya bungalows. During the same year tea was first planted out on the former estate, the seed being obtained from plants of China tea growing in the Royal Botanical Gardens at Peradeniya. Early in 1868 Mr. Taylor received from Calcutta the first consignment of Assam Hybrid tea seed. Unfortunately these seeds failed. A second consignment arrived at Looleeondura on the first day of 1869 and with plants raised from these a field of twenty acres that had been cleared for tea in 1867 was planted before the end of the year. While these bushes were coming into bearing, Mr. Taylor was unremitting in his endeavours to perfect himself in the preparation of the leaf. And to such good purpose did he work that in 1872 he was able at once to produce a tea of such quality as not only to ensure the ready sale in Ceylon of all his produce, but also to secure the approbation of the leading London brokers. The following sums have already been subscribed:—The Right Hon. Sir W. H. Gregory, K. C. M. G., £5; Sir Alfred Dent, K. C. M. G., £5; J. Whittall, Esq., £5; H. K. Rutherford, Esq., £5; J. L. Shand, Esq., £5; Messrs. Matheson and Co., £10; Messrs. Baring Bros. and Co., £10; G. D. B. Harrison and W. M. Leake, £5; John Hamilton, Esq., £5; Messrs. Anderson Bros., £5; Norman W. Grieve, Esq., £5.

INDIAN TEA IN RUSSIA.—According to a telegram from Vienna, the Russian Finance Minister, M. Vishnegradski has proposed to the Council of State to sanction a considerable increase of the duties on tea imported from British India. The new tariff will greatly affect the British tea trade, which is carried on through Turkestan.—*H. & C. Mail.*

CINCHONA DUTCH MARKET:

AVERAGE 3·92 PER CENT SULPHATE OF QUININE.

Amsterdam, October 29th.

All the analyses for the cinchona bark sales to be held in Amsterdam on November 6th have been published now, and the manufacturing bark contains about 13½ tons sulphate of quinine, or 3·92 per cent on the average. About 27 tons contain 1·2 per cent; 59, 2·3; 80, 3·4; 123, 4·5; 31, 5·6; 15, 6·7; 7, 7·8; 1, 8·9 sulphate of quinine.—*Chemist and Druggist.*

A GARDEN OF PAMPAS GRASS.—We read in *Garden and Florist* of a garden of Pampas-grass of 10 acres in extent, which is one of the objects of interest to tourists who visit Anaheim, California. This year about 40,000 plumes will be harvested, and the yield after the plants have become well established, will average 100,000 plumes. These plumes are worth about 5 cents apiece.—*Gardeners' Chronicle.*

PROFESSOR VAUGHAN-STEPHENS who returned from Pahang by the last trip of the S. S. "Glanggi," has covered a considerable stretch of country in the course of his recent ethnological explorations among the Sakeis and other wild tribes, chiefly between the Sungei Bubau and the Kemaman river. He has brought back a large quantity of the famous ipoh poison used to tip blowpipe arrows, and also a quantity of various other barks and saps for analysis. Thirty-eight living ipoh plants have been brought down by Professor Vaughan-Stephens and have been handed over to Mr. Ridley at the Botanical Gardens. The Professor has also brought down a large number of cases of Sakei curios of sorts. In the course of his tour he has received much kindly assistance from various European officers and other residents in Pahang including Messrs, Mitchell and Wall, Mr. J. A. Boll, and Mr. McEwen (Kabang).—*S. F. Press*, Oct. 31st.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &c., EDITOR OF "SCIENCE GOSSIP."

Dr. Cunningham's paper on the fertilisation of *Ficus Roxburghii* is creating much interest amongst botanists, inasmuch as it reveals the possibilty of certain flowers having the female parts fertilised without pollen. Dr. Cunningham shows that in the above species of fig the process of ordinary pollenation is impossible, and he believes that the embryo arises as an outgrowth of the cellular tissue of the body of the ovule outside the embryo sac, and not as the result of any development within it such as happens after ordinary pollenation. Minute insects gain access to the interior of the fig, and these set up irritation and overgrowth, so that both male and female flowers are possibly matured by the overgrowth of the receptable caused by insect irritation, and the embryos of the female flowers may be due to the same agency.

It is interesting to notice that your Moreton Bay pine (Arucaria Cunninghami) which forms such dense forests in Queensland, and is such well-known ornamental tree in and near all Australian cities and towns, has been discovered on the recently explored mountains of New Guinea at the height of 10,000 ft. What adds to the interest of this remarkable tree is the geological fact that during the early tertiary period it was a native of England, for its leaves, fruits, &c., have been found at Bournemouth and elsewhere, and have been described in the volumes of the Palæontographical Society by Mr. J. Starkie Gardiner.

The phylloxera is very much abroad in France this year, and, you will be all sorry to hear, in the Champagne district, it has hitherto avoided. An inspector of vine disease has been sent down to investigate and report, so you may imagine how hopeless the case is. The district between Vincelles and Treloup is that most affected.

Mr. A. W. Badger read an important paper last week before the Royal Horticultural Society on drying fruit by evaporation. Specimens were produced, and subjected to much criticism. The process, however, is an accomplished fact, but the worst remains behind. At present, drying necessarily destroys the flavour. Mr. Badger's aim was to introduce the American fruit evaporators to the notice of British fruit-growers. He claimed that evaporated fruit keeps better, and is more digestible and nutritious than when sun-dried or kiln-dried. In one district in the western portion of New York State, within a radius of 40 miles round the city of Rochester, no less than 37¾ millions of pounds of evaporated fruit was produced the last season but one, realising the value of £297,000. The greater part of these crops consisted of apples. One pound of evaporated apples, he said, contained all the constituents of six pounds of fresh fruit. Only water, he declares, is lost, and this is replaced by soaking. But it was contended, in the discussion which followed, that the evaporation volatilises the aroma.

Mr. E. H. Acton has recently shown that, notwithstanding the prevalent opinion to the contrary, some green plants can assimilate carbon from certain organic compounds in the absence of carbonic acid from the atmosphere. He prepared what he calls a normal "culture solution" for the purpose, and he concludes that green plants cannot normally obtain carbon for assimillation from any substances except carbo-hydrates, but that a compound may be a source of carbon to the leaves although not to the roots.—*Australasian.*

SUNFLOWER CULTURE IN CEYLON.—We have to thank Dr. Tothill for his letter giving the results of his several experiments in sunflower cultivation in Ceylon. These are not very encouraging, although it is evident that a trial under the immediate care of a resident planter might turn out much better, and to secure an oil equal in value to olive oil is a result not to be despised, apart from the other advantages mentioned.

CROPS IN INDIA:

SEASON TELEGRAM TO THE GOVERNMENT OF INDIA.

Week ending Nov. 1st.—North-east monsoon, though late, has fairly set in and good rain has fallen in all the southern districts and in Ganjam and Nellore. Standing crops generally good, and reviving after recent rains in several districts. Want of rain and of water still felt in parts of Vizagapatam, Kistna, Nellore, Cuddapah, North Arcot, Chingleput, Salem and Malabar. Paddy in Godavari and oil-seeds in parts of Cuddapah blighted; sugarcane damaged by heavy rains in parts of Coimbatore. Locusts appeared in parts of Ganjam, Cuddapah and North Arcot. Outturn of grains generally middling. Prices, rice and cholum rising, other grains falling. General prospects improving.

MALARIAL TROUBLES.

It is not every one who has a proper conception of what malaria means and really is. Malaria really means bad air, but for some reason, difficult to define, it has been restricted to the emanations from swampy districts. For example, a man who has fever and ague, or, as it is known among professional men, intermittent fever, is said to be suffering from malaria; whereas a man suffering from the noisome effects of sewer-gas in his house is assuredly the victim of malaria, though not suffering from intermittent fever. The fevers then, and the ailments following in their wake, that are produced in districts where there are warmth and decaying vegetable matter, are said to be malarial.

Malaria is a hydra-headed disease. Even that one form of it, "fever and ague," presents itself in various forms. It occurs most frequently in newly-populated districts; and in lands from which it has been supposed to have vanished it has been reproduced when their soil was turned. A man who has suffered once may suffer again, after a score of years, by simply running down in health. It may appear first as a chill, followed by intense fever, which, in its train, is followed by a sweating stage. It may appear simply as an intense neuralgia, and it may be noted that the most frequent from of malarial neuralgia appears over the brow, and is known as "brow ague." As if there was some similarity, distant no doubt, between paludal fevers and sewer-gas poisoning, it may be noted that neuralgic symptoms characterize both, and quinine certainly seems beneficial to both.

Formerly, quinine, and indeed all the cinchona prepartions, were more appreciated than they are at present. In the whole range of medical treatment nothing ever is encountered which is more wonderful than the action of quinine in malarial fevers. With its administration, the disease disappear, and that quickly. No doubt the dwellers in old countries and the residents of old towns would derive great benefit from a far freer use of quinine, and here we should take occasion to point out that the ordinary sulphate of quinine, the form usually used, is objectionable; it irritates the stomach, is quite insoluble, and is frequently not all absorbed.

The soluble Quinine Tabloids are the best preparation, inasmuch as one of them dissolves in a little water the minute it touches it. They do not irritate the stomach, can be taken (without the taste being perceived, and none of the drug is lost in the system. Those suffering from enervated health, whether from sewer-gas, or marsh emanations, overwork, worry, sleeplessness, or any of the thousand ills that go hand in hand with civilization, will find quinine useful—more useful as a tonic than any of the myriad drugs that glut the market.

Under ordinary circumstances a two-grain Tabloid is sufficient. In malarial troubles as much as twenty grains should be taken in a day.—"*Health*" *London.*

THE ENEMIES OF COTTON:

IN THE HAPITIGAM KORALE, CEYLON:

No. 1. Rats dig out and eat the seeds before they germinate.

2. A fly cuts holes in the leaves.

3. A grub rolls up the leaves and lives on them.

4. A grub enters the pods shortly after they form, and eats the seeds.

5. Rats break up the pods as they approach maturity, eat the seeds, and scatter the fibre mixed with the seed husks on the ground.

Result of all those encouragements: one sound pod in fifty.

A very prolific species of ladybird swarms on the bushes, but seems harmless, living probably on some excretion of the plant.

Wo will be good boys and never do it again.

WIREWORM AND LIME.—A correspondent of the *American Florist*, October 1st, asserts that 3 or 4 lb. of unslaked lime to every bushel of soil to be used, will act so perniciously on the wireworms contained in the soil that they will give it a wide berth. The best way to use the lime is to spread the soil in a flat heap, say 10 or 12 inches high, and place the required quantity of lime on the surface, and when the latter is slaked, it should be pulverised and mixed thoroughly with the soil.—*Gardeners' Chronicle.*

ARTESIAN WELLS AT MADRAS.—A bore at Negapatam has been sunk to a depth of only 200 feet which in the country of Artois itself would have been considered extremely moderate and far below the average. With a bore of this depth the water rose to within one foot of the ground surface, thus practically demonstrating that an artesian spring had been struck. In the Madras Presidency at least wells have not been bored to any great depth and great advantages might accrue if the Negapatam Councillors persevered in their efforts to sink the bore deeper, even though it may not be clear to them that better results would be achieved. The Government order on Dr. King's Report promises help from Provincial funds as an inducement to the Councillors to continue work. As it now stands the well is a success in as far as the two essential requisites of a water-supply, namely, quality and quality, have been secured.—*Pioneer.*

"CLEARING THE AIR" OF DISEASE GERMS.—We referred the other day to thunder "clearing the air" in connection with our first thunderstorm of the North-East Monsoon season. But we are reminded by a scientific writer that heavy falls of rain also "clear the air" especially when accompanying a thunderstorm. A Home writer says:—

Copious thunder-"plouts" level to the earth the millions of disease-germs that impregnate the atmosphere. It has now been acknowledged that near a large town the average number of bacterial micro-organisms is in summer about 500 per cubic yard. Of course, in a town the number is about sevenfold. Now the heavy rains carry these germs to the ground. After very dry weather, a cubic yard of rain has been found to contain 150,000 organic dust-germs, besides an enormous quantity of inorganic dust-particles. In a filthy town, no less than thirty millions of bacteria in a year will be deposited by the rain upon every square yard of surface. No wonder, then, that scientific men welcome the thunderstorm, which by the heavy showers removes from man and beast the terrible floating nuclei of disease and death. During the twenty-four hours before a thunderstorm, a man will require to breathe 37,500 bacteria, more or less active agents of sickness, besides millions upon millions of dead organic and inorganic dust-particles—a fact which makes one really marvel how he can possibly escape; yet, after the deposit of these germs by the joint action of turmeric current and copious rains, the air is far more wholesome.

ARTIFICIAL GEMS.

Mr. Charles Bryant writes to the *Standard*:—I notice that in a recent issue Mr. Greville Williams, of the Gas Light Company, has manufactured a perfect emerald from the refuse of a gas retort, and that he could in like manner produce other precious stones; but fortunately, as you state, the cost of producing them would be prohibitory, and this is one reason why those who possess jewels need not entertain the least fear that their gems are about to become diminished in value, if not absolutely worthless, by the artificial production of precious stones, because there is virtually nothing new in Mr. Williams's discovery—precious stones having been artificially produced more than sixty years ago, and with all the experiments that have since been made by eminent chemists, the results have been very far from successful in a commercial sense.

It may be interesting to many of your numerous readers to know that several kinds of precious stones have been actually produced by artificial methods, endowed with all the chemical and physical characters of Nature. In 1837 Gaudin produced rubies by heating ammonia, alum, and potash by means of the oxyhydrogen blow-pipe, the intense heat developed by this apparatus volatilising the potash and the alumina, then crystallising in rhombohedral forms identical with those of the natural stone, and having the same specific gravity and hardness. Ten years before Gaudin's experiments Berthier produced a great number of minerals, such as peridot, pyroxene, &c.

The spinel has been produced so perfectly as to be indistinguishable from the natural gem, by subjecting a compound consisting of proper proportions of alumina, magnesia, chromium, and boracic acid to a high temperature for several days, and later experiments founded on the principle of Datbree and Durocher have resulted in the production of crystals of white, blue and red corundum, *i.e.*, colourless sapphires, blue sapphires, and rubies. Crystals of chrysoberyl I have produced by subjecting the fluorides of aluminium and glucinum to a very high temperature.

Attempts have been made to produce the diamond artificially, but the specimens obtained have been so extremely small as to be of no use, and the results obtained do not differ much, so far as success goes, from those of the alchemists who sought for that imaginary substance, the philosopher's stone, in the hope that they could make gold out of the baser metals, and although the attempts at reproducing many of the precious stones have been met with a certain amount of success experimentally, no one is likely to take upon himself the trouble and expense of so unprofitable a business, commercially, as producing artificial precious stones.

Ten years have now elapsed since Mr. Hannay, of Glasgow, succeeded in producing, at much cost and great danger, artificial diamonds, by enclosing a mixture of paraffin spirit and bone oil distillate with metallic lithium in a strong wrought iron tube, and exposing it to a prolonged heat in a reverberating furnace. The success which followed was undeniable. The result was diamonds, but they were of such small size as to be practically worthless, even could they have been generated by a cheaper process especially as it was found that when placed on the cutting wheel they immediately crumbled. At the same time, if anything is certain, it is that eventually by means too simple even to be foreseen, noble crystals of a gem still precious in spite of South Africa will be manufactured in the laboratory, as a price so low that they and the prismatic pendants of the chandelier may be rated at much the same value. But the diamonds and the other precious stones came into different categories. The one is a pure substance, the others are mixtures of various mineral matters. The moment that Smithson Tennant proved, nearly one hundred years ago, that the diamond was merely carbon, the crystallisation of this element, which is one of the most widely distributed in nature, was simply a question of chemical manipulation. And the processes of the arts have of late years undergone such vast improvements that it is impossible not to believe in the eventual solution of the problem which in Mr. Hannay's hand was only a *succès d'estime*. But we may be well assured that the fortunate man who first sees the gems glittering in his crucible will not be in any hurry to take the Royal—or any other—society into his confidence. Unless differently constituted from the rest of his species, he will utilise the victory at which he has arrived for his own enrichment.

Most of the precious stones are, however, complicated mixtures of ingredients of which the mechanical disposition, as in mossagates and other pebbles, cannot always be exactly ascertained, while the precise percentages of the substance to which they owe their varied hues have often defied the chemist's analysis. Thus the gem which Mr. Williams has modified from the refuse of the Gas Light Company's retorts is composed of about sixty-seven to sixty-eight per cent of silica, fifteen to eighteen of alumina, twelve to fourteen of glucina, minute proportions of magnesia, carbon and carbonate of lime, while the intensely green colour for which the jewel is valued is believe to be due to a slight dash of sesquioxide of chromium, though this tint has by some chemists been attributed to vegetable matter, the analyst having to proceed warily when dealing with such costly stuffs as diamonds and emeralds. We may, therefore, presume that Mr. Williams has turned out his artificial emerald by skilful fusing and crystalisation of these ingredients. It is also permissible for us to imagine that in time he will simplify his process, until the Gas Company's "superior six carat" stones set in fourteen carat gold will be recommended to thirty dandies at a price which will defy competition, even though the profits from this branch of the business do not add materially to the dividends of the shareholders. Still as Mr. Bryant says, Mr. William's experiments, if interesting, are not in themselves unprecedented, except that they have resulted in the concoction of a gem not hitherto produced by the same means. For crystals of chrysoberyl have been turned out by subjecting the fluorides of aluminium and glucinum to a very high temperature, and early in this country Berthier fabricated a great many minerals, including peridot (chrysolite), pyroxene (augite), and others not of any economic importance. Colourless sapphires and blue sapphires are among the triumphs of the laboratory. But most remarkable of all, rubies of excellent hardness and hue have been produced by a process of synthesis under the action of fire, though it is doubtful whether this was the means by which they were originally crystallised in the earth's crust. As far back as 1837 Gaudin produced the ruby on a small scale, by exposing ammonia-alum to the heat of the oxyhydrogen blowpipe. By the intense heat, thus generated he obtained fused alumina which is readily coloured by the addition of oxides of chromium, the crystals appearing in the rhombohedrals and characteristic of the mineral, and having the same specific gravity and hardness. At a later date, Ebelmen arrived at much the same results by a different method. He dissolved alumina in boric acid at a high temperature, and on the cooling of the mass

obtained the alumina in a crystallised form, and if chromate of ammonium was present the crystals were to all intents and purposes rubies. Again, Sainte-Claire, Deville, and Caron heated fluoride of aluminium, fluoride of chromium, and boric acid, and in this way obtained fluorids of boron, which escaping in a volatile condition left a residue of solid alumina coloured by the chrome.

These results, it may rightly enough be urged, were mere laboratory experiments. But the manufacturer of precious stones has gone a great deal further than this s'age, and it is certain will proceed far beyond the milestone at which it is at present resting. For in 1878 Fremy and Feil reproduced the ruby and sapphire on a large scale, by heating in a fire clay crucible a mixture of alumina and red lead. The result of this fusion was a vitreous silicate of lead (the silica being derived from the crucible) and crystallised alumina. When to this bichromate of potassium was added, the aluminia assumed the desired tint of the ruby. By this process spinels have been produced quite undistinguishable from the natural gems, even when the most minute tests were applied to them. It cannot, perhaps, be claimed as yet that such laboratory jewels will satisfy all the requirements of the cutter and polisher, but when this point his been once attained, it is certain that they will soon run the real, or rather the old fashioned, article very closely. The most pessimist of sceptics cannot carry his prying so far as to apply the test of the knife-point for hardness of the acid for composition of the dichroiscope for "pleiochroism," or ask the wearers to allow their jewels to be weighed for specific gravity in Sonstadt's solution. And if not, who need trouble themselves further? Family diamonds are costly articles to keep simply for the gratification of the owner's knowledge that they were dug out of the mines of Golconda or of Minas Geraes, and they would soon be locked up in safety if a set externally identical could be bought at a twentieth of the price. Already, in fact if only a portion of the tales told are true, prudent people are growing loth to keep in their jewels cases exposed to the risk of robbers, convertible securities representing an income of four or five hundred a year, when the ingenious artists of the Palais Royal can supply something undistinguishable from them for a very moderate number of francs. These jewels, which are mere imitations, not chemical reproductions like the gems mentioned, far surpass the old paste mimicries, their only fault being that if anything they sparkle rather too brilliantly. Some of them of which the basis is glass, are rather coarse. But there are others of such amazing perfection that an amateur runs serious risk in buying from unknown dealers on his own unassisted judgment. Amethysts in an especial degree have been made so fine that they have deceived connoisseurs, and numbers of them are regularly exported to Ceylon, where they are duly disposed of to the unsuspecting passengers of steamers halting at Colombo. Since the decrease in price of the real stones the danger of imposition is less, yet a case occurred not long ago in which a jeweller declined to pronounce on the value of a "stone," until he had submitted it to an expert, when it was pronounced one of the Parisian sort.—*Indian Agriculturist.*

THE AUSTRALIAN "SHE-OAK" (CASUARINA) is prospering in Aberdeenshire. "Old Colonist" who considers it the very best firewood the world produces, reports that from seed gathered by him in Tasmania, trees are now flourishing on Deeside and their growth is equal to 18 inches in the twelve months.

PADDY (RICE) CULTIVATION IN CEYLON.

We call attention to the able letter on page 462, in which Mr. Elliott—in his own name—justifies his position in reference to the recent experiments and discussion connected with Paddy Cultivation. There can be little doubt that Mr. Elliott has a more intimate and practical acquaintance with his subject than any of his critics—whether official or unofficial—and we may say than any other public servant in Ceylon. He has been consistent too in, for many years, upholding the view he has adopted and while our own inclination has been to limit the profitable cultivation of paddy to select divisions of the country—a limitation in which to a great extent no doubt, Mr. Elliott agrees—yet, we are bound to confess that he has given us reason to believe that rice cultivation is far more widely profitable in Ceylon than we had at all believed before Mr. Elliott engaged in experiments or wrote expressly on the subject.

WESTERN AUSTRALIA is certainly the coming Colony if, as a telegraphic report has it, an expert values its forests alone at a hundred millions sterling, as their present marketable value. We in Ceylon should be greatly interested in our nearest neighbour; for as its population leaps up by thousands and perhaps hundreds of thousands, we ought to do a good trade in supplying them with all the tea, cocoa &c., they require.

ELECTRIC LIGHT EFFECTS ON CANE GROWTH.—As it is a well known fact that the growth of cane or any other vegetation depends perhaps as much upon light as on heat, and that a large amount of sunshine is very desirable to secure the rapid growth of cane, the thought has been suggested that electric lights may yet be used to advantage to promote the growth of sugar in this latitude, where forcing is desirable if not absolutely necessary. At first thought, almost any one would be inclined to ridicule the idea. Still, we notice that our tropical exchanges consider that when they have storms that electricity plays an important part in the growth of cane. Is it not possible that where many electric lights are used, that the air to a certan extent becomes charged with that powerful element? If not, certainly light has great influence on vegetation, as science has proven; and this brings the thought that the "moon philosphers" may be partly right in their planting theories—or, that the *light* of the moon may produce that effect on vegetable growth that they attribute to something else.—Our attention was recently called to this subject by a friend, who said he thought he saw a greater leaf development on trees and shrubs on the side adjacent to electric lights. Later, he made the following clipping from a technical journal, which shows that it *is* a fact—and possibly a most *important* one for cane growers—that electric light has great influence on vegetable growth: —"A beautiful illustration of electric light on plants was recently given by Dr. Siemens before the Royal Society of England. He placed a pot of budding tulips in the full glare of the electric light in the meeting room, and in about 40 minutes the buds had expanded into full bloom. In giving a statement of some of his experiments, Dr. Siemens said that he had planted a number of quick growing seeds in pots, and divided the pots into four groups; one group he had kept entirely in the dark, another he had exposed to the influence of the electric light only, another to the influence of daylight only, and another to electric light and daylight in succession. Death soon resulted to those plants which were kept entirely in the dark; those exposed to the electric light only, and those exposed to the daylight only, throve about equally; and those exposed to both day and electric light throve much better than either." —*Sugar Bowl and Farm Journal.*

MANURE FOR THE GARDEN.

A capital little essay on the use of nitrate of soda for manure, and the best mode of its employment, has just issued from the able pen of Mr. Joseph Harris, M.S., of New York, of which we will give some extracts, specially written for gardeners.

Farmers and gardeners sometimes express surprise that agricultural chemists talk so much about nitrogen. When it is known, however, that of all the organic matter of plants and manures—in other words, all the matter which is driven off by burning—the only element of any direct value as plant-food is nitrogen, it will be readily seen that nitrogen is entitled to even greater attention than it at present receives.

Gardeners and fruit-growers fully recognise the value of stable and farmyard manure. In a ton of ordinary manure, containing 75 per cent. of water, there is 1275 lb. of organic matter and 225 lb. of ash. Except for its mechanical and indirect benefit to the soil, all the manurial value of this quantity of organic matter is due to the nitrogen which it contains. Is it any wonder, therefore, that we hear so much about nitrogen?

NITRATE OF SODA FOR ONIONS.

An average crop of Onions removes from the soil about the same amount of nitrogen as an average crop of Turnips; but a crop of Onions will often sell for three, or four, or five times as much as the latter.

On Mr. Harris' farm, Onions are extensively grown, and he finds it necessary to make the land exceedingly rich, especially in nitrogen and phosphates. And of all manures for producing a large crop of Onions, nothing equals nitrate of soda.

When this manure was first used, 250 lb. per acre were sown early in the spring, before drilling-in the Onion seed, with 500 lb. per acre of superphosphates. As soon as the young plants appeared, it was the custom to go through them with the hoe to break the crust and kill the weeds, and then sow 250 lb. more of nitrate. In two or three weeks, another 250 lb. per acre was sown. The effects were found to be astonishing; no amount of ordinary manure that could be worked into the soil the first season would produce so great a growth. Latterly it has been thought quite as well to sow the nitrate broadcast all at once, about the time the seed is sown.

WHY IS IT FOUND NECESSARY TO USE SO MUCH MANURE IN THE GARDEN?

Reference has been made to the great benefit derived from the use of nitrate of soda on Onions. There is a common opinion that the longer Onions are grown year after year, on the same land, in market gardening, the better will be the crop. Enormous quantities of dung are applied every year. This supplies nitrogen, phosphoric acid, potash, and other ingredients of plant-food far in excess of the amount removed with the crop. And yet it is found necessary to furnish a heavy dressing of manure every year; and if this be not done the crop is poor and unprofitable.

The same is true of early Cabbages and early Cauliflowers. It is found necessary to use enormous quantites of manure for these crops—far in excess of the plant-food removed in the crop. Gardeners who make a specialty of growing large areas of early Cabbage, find it almost impossible to make the land rich enough the first year; they find that the second or third crop, grown and manured every year on the same land, is better and earlier than the first crop.

An experienced American gardener recommends the application every year of 75 to 80 tons of stable-manure per acre for early Cabbage, and 10 tons per acre for late Cabbage. This 75 tons of manure contains 820 lb. of nitrogen, or as much nitrogen as 5,100 lb. of commercial nitrate of soda probably contains.

Ten thousand early Cabbage per acre, weighing 5 lb. each is a good crop.

These Cabbage (25 tons per acre), contains 120 lb. of nitrogen, equal to 750 lb. of nitrate of soda. In other words, gardeners use nearly 7 lb. of nitrogen in the form of manure to get back 1 lb. of nitrogen in the crop.

It is now known that the nitrogen in the organic matters of the soil or manure is slowly converted into nitric acid by the growth of a minute organism, apparently a micro-coccus. This micro-coccus cannot grow if the soil be too cold, or too wet, or too dry, or in the absence of lime or an alkali.

As a general rule, there is no lack of lime in the soil, and the other conditions necessary for the conversion of the nitrogen into nitric acid, are warm weather, and a moist porous soil.

In the early spring the soil is too wet and too cold for the change to take place; we must wait for warm weather. But the gardener, who grows for sale, does not want to wait: he makes his profits largely from his "yearly" crops. Guided only by experience and tradition, he fills his land with manure, and even then he gets only a moderate crop the first year. He puts on 75 tons more manure the next year, and gets a better crop; and another 75 tons the next year, and gets a still better crop. The nitrogen of the soil, or of roots and plants, or dung, is retained in the soil in a comparatively inert condition. As it is slowly converted into nitric acid during warm weather, the plants take it up and grow rapidly. Unfortunately, however, if we have no plants growing in the autumn, and there is much nitric acid left unused in the soil, the rains of winter and early spring wash out a large proportion of it, and it sinks into the subsoil.

How, then, is the market gardener to get the nitric acid absolutely necessary for the growth of his early plants? He gets it, as before stated, from an excessive and continuous use of stable manure, and even then he fails to get it in sufficient quantity. One thousand pounds of nitrate of soda will furnish more nitrogen to the plants early in the spring than the gardener can get from 75 or 100 tons of well-rotted stable-manure. The stable manure will furnish nitric acid for his later crops; but for his early crops, the gardener who fails to use nitrate of soda, is said to be blind to his own interests.

The same remarks apply with equal force to Celery plants. For several years, the writer has grown over a million Celery plants a year. By the use of an enormous amount of rich manure, he was able to grow good outdoor Celery plants.

Eight years ago, he used nitrate of soda cautiously as a top-dressing, and the effect was most satisfactory. The next year, having more confidence, the nitrate was sown with the seed, another dressing was given after the plants came up, and twice afterwards an application was made during rain. Instead of finding it difficult as before to get the plants early enough for the Celery growers, who set them out, they were ready three weeks before the usual time of transplanting.

At the four applications, about 1,600 lb. of nitrate of soda per acre was used, and this would probably furnish more nitrate acid to the plants than they could get from 500 tons of stable-manure, provided it had been possible to have worked such a quantity into the soil. It was said that never were finer plants grown; and compared with the increased value of the plants, the cost of the nitrate is stated not to be worth taking into consideration.

The next year the same treatment afforded equally good results, though it was noticed that on part of the land where Celery plants had been grown the previous year, and followed afterwards by a crop of late Cucumbers for pickles, and the land again sown to Celery in the spring without manure, the plants were not so good as when dung, as well as nitrate, was used.

It is now the aim to dung the land in the autumn, and use nitrate of soda in the spring. In other words, nitrate of soda is not used as a substitute for dung, but as a highly prized and invaluable addition.

NITRATE OF SODA AND DROUGHT.

Celery is a semi-aquatic plant. It delights in an abundant supply of water. But it is found that nitrate of soda is in part a substitute for water, and the same is true of many other plants. In the dry climate of America, Pansies are supposed to require a damp soil or large supplies of water. But it has been found that

nitrate of soda, even on dry, sandy soil will produce a luxuriant growth of plant, and a profusion of the largest and most brilliant flowers. The effect of this manure on the growth of the Convolvulus bine, and the colour of the leaves, and the size and beauty of the flowers, is said to be most remarkable. The effect on Asters is equally satisfactory.

NITRATE OF SODA FOR STRAWBERRIES, CURRANTS, AND RASPBERRIES.

The Strawberry grower knows the value of water. If he will try nitrate of soda he will find it wonderfully efficacious.

The effect of this fertiliser on Strawberries in the dry climate of the United States is very beneficial. It not only doubles or trebles the yield, but the berries are larger and handsomer, and consequently command a much higher price in the market.

No ordinary amount of manure will produce so great an effect, for the reason that the plants grow and form their fruit early in the season. The nitrate furnishes the plants with nitric acid before the nitrogen of ordinary dung can be converted into this essential ingredient of plant food.

A few years ago, Mr. Harris, published a statement in regard to the astonishing effect of a large dressing of nitrate of soda on an old Strawberry bed. The bed had been neglected, and was full of grass and weeds. At that time nitrate of soda had not been tried on Strawberries, and it was not known but that might injure them. But this particular bed was so run out and wortbless, that no anxiety was felt whether the nitrate killed the plants or not.

Two or three heavy dressings were sown broad-cast, early in the spring and a few weeks later. Instead of killing the plants, the nitrate made them grow so vigorously that with a little assistance from a sharp hoe, and by pulling out the large weeds, the Strawberries overpowered nearly all the grass, and remarkably fine crop of fruit was obtained.

Since that date nitrate of soda and superphosphate has been used on all Strawberry plantations, and this dressing is found far more effective and economical than stable dung.

Another instance is given of an old Strawberry bed, in its fifth year of bearing, which was in an exhausted condition and foul with weeds. This was dressed in the spring of 1888 with 300 lb. of nitrate of soda per acre. The effect was amazing, for this bed of 1¼ acre, from which hardly anything was expected, gave fully 7000 quarts of Strawberries. The description was variety Crescent, with fertilising rows of Wilson, Sharpless, and others. The crop was nearly as large as the best the plot had made. This was on moist bottom-land, naturally fertile. Nitrate of soda is, at least, equally as good for Raspberries as for Strawberries. On Currants, with clean cultivation, large crops of fine fruit have been raised for several years, with a top-dressing of nitrate of soda alone, applied on each side of the rows early in the spring.

On poor land it is recommended to apply superphosphate and potash in the autumn, and plough or cultivate them in; and the following spring—and, in fact, every spring—give a top-dressing of nitrate.

NITRATE OF SODA AND WEEDS.

From what has been said about the effect of nitrate on the old grassy Strawberry-bed, it must not be inferred that this substance will kill weeds and nourish wholesome plants. Nitrate of soda, properly used, makes "rich land;" and it is known that weeds, if they have the chance, will grow luxuriantly in rich soil. It is also well known that a light, thin crop, favours the growth of weeds, while a heavy, "smothering crop," will hold them in check. Much depends on whether the crop or the weeds get the start. Hence, it is of vast importance to make the land as clean as possible before sowing the crop, and to keep down the weeds by the frequent use of the cultivator and hoe. If this is done, nitrate of soda will make the crop grow so rapidly that it will smother or check the weeds. On the other, if this is not done, the weeds will prove better fighters than the crop we want to raise, and they will secure the lion's share of the nitrate, and with the nitrate they will also appropriate other plant food and moisture, and thus the nitrate, instead of helping the crop, may actually injure it. There will be a large total growth of vegetation, but it is vegetation of the wrong kind.

NITRATE OF SODA FOR TOMATOS.

Professor Voorhees, of the New Jersey experiment station, made experiments with different fertilisers on Tomatos in 1889. The trials were made on the farm of Mr. C. M. Housell, an intelligent practical gardener, who attended to all the details. The results were as follows:—

Manures used per acre.	Cost of Manures	Value of the crop per acre.
	Dols.	Dols.
Without manure...	...	271·88*
20 tons stable dung	30	291·75
8 tons stable dung and 400 lb. complete fortilizer...	15	317·63
160 lb. nitrate soda alone... ...	4	361·13

The above manures were all applied May 7. On an adjoining plot, 160 lb. of nitrate of soda was sown May 7, and again on June 12, when the Tomatos were beginning to set; another dressing of 160 lb. was sown on the surface around the plants. This plot produced a crop which sold for 369 dols. per acre.

The first dressing of 160 lb. of nitrate yielded a profit of 85·25 dollars per acre; the second dressing of 320 lb. produced a profit of only 3·87 dollars per acre.

It is evident, therefore, that 160 lb. of nitrate of soda per acre was all that the plants needed, or could make use of without a greater supply of phosphoric acid and potash than the soil afforded.

In addition to the above experiments, Professor Voorhees made others that are worthy of consideration. The results may be tabulated as below:—

	Manures per acre and date of sowing.	Cost of Manure.	Value of crop per acre.
		Dols.	Dols.
A.	Without Manure	...	271·88
B.	160 lb. Muriate of Potash 300 lb. Superphospbate	7·2	284·25
C.	Same as B. with 600 lb. Nitrate Soda, May 7	11·2	356·63
D.	Same as C. with 160 lb. additional Nitrate, June 12	15·2	429·38
E.	Same as B. with 320 lb of Nitrate, May 7	15·2	395·25

It will be seen that the addition of phosphates and potash to the 160 lb. of nitrate soda had no effect. The reason for this is, that the soil could furnish enough phosphoric acid and potash for all that the crop produced by the 160 lb. of nitrate required. But when an additional 160 lb. of nitrate was used, then the phosphoric acid and potash came into play, and the crop brought 429·38 dollars per acre.

It will be seen further, that the 320 lb. of nitrate applied May 7 on Plot E., did not have as great an effect as the same amount of nitrate of soda applied at two dressings, on Plot D.

It may surprise many gardeners that 20 tons of good stable manure did not produce as large a crop of Tomatos as 160 lb. of nitrate of soda. The 20 tons of dung contained not less then 160 lb. of nitrogen, while the nitrate of soda contained only 25 lb. And that the great effect produced by the nitrate of soda was due to the nitrogen, there is abundant evidence.

Why then, did not the 160 lb. of nitrogen in the dung do as much good as the 25 lb. in the nitrate? Simply because the nitrogen in the dung has to be converted into nitric acid before the plants can use it. —J. J. WILLIS, Harpenden.—*Gardeners' Chronicle.*

* A dollar is equal to about 4s. 2d.

Correspondence.

To the Editor.

ENEMIES OF COFFEE AND REMEDIES.

London, Oct. 24th.

Dear Sir,—Following my letter to you of last mail on the subject of the application of solution of sulphate of copper to our coffee trees for extermination of the pests by which trees are beset, I now write to enclose copy of a letter I have received from Messrs. W. and A. Gilbey, the large wine merchants here, giving interesting and valuable information concerning the subject in question, and I am yours faithfully,

for THOMAS DICKSON,
W. G. Smith.

Oxford Street, London, W., Oct. 20th.

Thomas Dickson, Esq , Managing-Director, The Scottish Trust and Loan Co. of Ceylon.

Dear Sir,—In reply to your letter of 16th inst. on our estate in the Medoc we use a solution of sulphate of copper for the purpose of destroying the mildew or white fungus which forms on the underside of the leaves of the vines. It is not applied to the roots but solely to the leaves. Other preparations are applied to the roots for the purpose of combating the Phylloxera, which however is an entirely different pest. The method of applying the solution of sulphate of copper was formerly to sprinkle it over the vines by means of a broom, but a more effective way is to use a force pump fitted with a fine rose. A shower of solution is allowed to fall on the *upper* surface of the leaves which gradually spreads over the whole surface of the plant. The solution is prepared in the following manner :—Dissolve 4 lb. sulphate of copper in 3 gallons of warm water. Slake 2 lb. of quick lime, and when cold put the lime into the solution of copper. Add to the whole 20 gallons of water and stir up well. (Pass the lime through sieve to separate gravel, etc., which might choke the syringe used for distributing.) This mixture is called Bouille Bordelaise and is prepared sometimes with cold water, and recently we learn that the addition of 1 lb. of molasses has been found to be an improvement. For vines about 30 gallons per acre are used for the first treatment say, in June, and 40 to 50 gallons for the second treatment 4 or 5 weeks later. Before distributing the liquid should always be well stirred. Sulphate of copper is dangerous to human life and consequently all experiments must be made with care. Applied to the vine in the manner indicated we find that the wine is not affected, but it is quite possible that the coffee berry might retain a percentage of the copper if strong solutions are used. A weak solution only is always applied when the leaves are young and tender. No solution should be applied for two or three weeks before the crop is gathered. If we can give you any further information on the subject we shall be happy to do so on hearing from you, or our friend Mons. Skawinski of Lesparre would no doubt give you full details as to prices of materials, syringes, etc., if you communicate with him. His full address is:—

Mons. Theo. Skawinski,
(Société Medocain)
72, Rue Jean Jacques Rousseau,
Lesparre, France.

—We are, dear sir, yours faithfully,
(Signed) W. & A. Gilbey.

Tea Exports from Japan have this year been very large, amounting (according to native papers), up to the 15th ult., from Kobe and Yokohama to, 6,700,000 catties—the largest total reported in the history of the ports. From Yokohama alone the export exceeded 5,383,000 catties.—*China Mail.*

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, Nov. 15th.

Dear Sirs,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 23rd October 1890.

Exports of Indian Tea From Calcutta.

	1890 lb.	1889 lb.	1888 lb.
Exports to Great Britain in Oct.	15,544,159	14,854,553	12,967,076
Exports to Great Britain from 1st May to 31st Oct.	55,959,410	55,669,073	52,992,558
Exports to Australia and New Zealand in Oct. ...	409,972	149,148	446,731
Exports to Australia and New Zealand from 1st May to 31st Oct. ...	2,703,418	1,956,540	1,791,298
Exports to America in Oct.	10,810	13,200	906
Exports to America from 1st May to 31st Oct. ...	72,882	104,047	64,025
Exports to other places in Oct.	145,456	54,544	40,157
Exports to other places from 1st May to 31st Oct.	671,733	1,116,148	538,587
Total Exports from 1st May to 31st Oct. ...	59,407,442	58,845,808	55,386,463

—Yours faithfully, S. E. J. CLARKE, Secretary.

MR. JOHN HUGHES AND CEYLON TEA ANALYSES.

London, E. C., Nov. 7th.

Gentlemen,—Just a few lines to direct your attention to an interesting lecture on tea by Mr. Richard Bannister published in the Journal of the Society of Arts of October 31st which I believe you regularly receive.

After a review of the rise and progress of the tea industry generally in China, India and Ceylon, there are some practical remarks on tea-making, and tea analyses.

Only two complete analyses however are given, which is a matter of regret, inasmuch as these show considerable difference in the proportions of Tannin and Cellulose (Woody Fibre). Thus a sample of Congou gave 16·40 per cent of Tannin as against 27·14 in a sample of young Hyson—while the Cellulose was 34·00 in the former and only 25·90 per cent in the latter.

There are some 19 samples of Ceylon Tea reported upon by Dr. Paul, who however only examined them as regards the amount of moisture and Theine which they contained, and in which the variation was very small and therefore of little practical importance. The highest Theine was 4·54 per cent in a sample from Nahalma estate, and the lowest 3·22 in some Calsay Pekoe Souchong.

When we consider that Theine is an alcaloid which has very little flavour, though possessing powerful medicinal properties, it will be at once understood that a difference of 1 per cent cannot possibly influence the tea taster in his valuation of different samples for market purposes, and that any attempt to estimate the probable commercial value from the percentage of Theine found by analysis would be quite useless. From the two complete analyses mentioned above, however, there does appear to be a great variation in the proportion of Tannin which from my new experience, I am inclined to regard as the constituent which influences the strength of tea infusions more than any other, while we may regard the *quality* and

quantity of the volatile oil as the chief factors in producing a difference in the flavour and bouquet.

It is in reference to these two constituents I submit that more extended information is still required, and with these few remarks I commend the lecture to the careful perusal of the readers of the *Tropical Agriculturist*.—Yours faithfully,

JOHN HUGHES.

PADDY (RICE) CULTIVATION IN CEYLON

MR. ELLIOTT IN REPLY.

Batticaloa, Nov. 18th.

DEAR SIR,—I have read "A."'s letter on paddy cultivation with pleasure; he is evidently a worker in the same field as I am and a professor of the same belief as I hold, viz., that "paddy does pay" and no mistake. He has most opportunely published a very able resumé of what may be called the circumstantial evidence on the subject. The facts he sets out seem to my mind to be consistent with the conclusion he draws and inconsistent with any other rational conclusion. He thus fulfils the requirements legally required of such evidence, but forgets "there are people who are not ready to lend an academic faith to a narration of facts which do not strictly accord with preconceived opinions, mistaken for knowledge. In all ranks and conditions of life, persons of this stamp abound and the errors to which their habits of distrust expose them are at times ridiculous."

So says an eminent authority, and it is because I have found the circumstantial evidence not generally accepted that I have endeavoured to go a step further and see what direct evidence on the point could be brought forward. But "A." (and others) have misunderstood the scope of my subsequent action and the object I have in view in securing the publication of the results of the experimental cultivation I have had opportunities of undertaking. I therefore address you in my own name to set myself right with the public and, I trust, show that my experiences have a more important bearing on the subject than is recognized by your correspondent.

For years the dictum of Sir Charles Layard had been accepted as almost settling the question that paddy did not pay, and this view was supported by the particulars of the cost of production published in a book by the late Mr. Leopold Ludovici and adopted (if my memory serves me right) by "Speculum" who now in another sphere emphasizes the erroneous views he early adopted on an imperfect investigation of the matter. Over twenty years ago, I had reason to arrive at a very opposite conclusion, and as my enquiries showed the data heretofore made public were defective and misleading I ventured to work up the information I had gradually gathered into the paper I read before the Ceylon Branch of the Asiatic Society in 1885. I have every reason for believing that my paper was the first intimation a large number of the community had received that there was something to be said on the other side and that Paddy Cultivation was not the miserable speculation it had been so long represented.

The results then published were founded on enquiries made from native sources and based on *estimates* of working expenses. Since that I have had opportunities of actually cultivating paddy and have published the results of my experience. I do not say that these are on all fours with native modes of cultivation: on the contrary I have always admitted that *ceteris paribus* the "dry ploughing" system introduced by Mr. Green gives a larger crop than the best ordinary native mode of working, and of course the primary object of the experiments has been to "show the way" to our native cultivators. Here and there we have succeeded in influencing a few, and by hammering away we may induce more imitation in time; at present the excuse is "Oh! we cannot afford to work so expensively as you do," and when we point to the larger return as compensating for the additional outlay, the reply still is "Oh! it will not pay us."

The first fact, therefore, established by my experiments is that I am working far more expensively than does any native in the country including all the so-called extortionate rates of interest (which are not so heavy as they appear on paper I may add). The next point I have established is that working on a ready money basis and paying for all services, an outlay of R16 to R17 is the outside limit of the actual *expenses of cultivation* of an acre of land.

With these two points established, we are able to absolutely deny the correctness of the estimates of the expenses in excess of these figures we see put forward continually: such, for instance, as that given by Mr. Panabokka to the Grain Committee when the cost of cultivating two acres of land at Ratnapura is given at R107·96. Another point on which our experiments throw light is that it is possible with the expenditure stated to secure in irrigated land a profit over working expenses of about R20 an acre, to cover interest on the capital outlay, superior supervision and other expenses attendant on extended cultivation. There is no room to doubt that it is quite possible to cultivate the same land twice a year if the water supply is assured.

Such are the facts which I think the experience I have gained actually establishes; and they are I think useful factors in the discussion of the question whether paddy pays. I am also not without hopes that the information I have given may not be without its influence in encouraging capitalists to seriously undertake the extended cultivation of paddy on a money payment basis. I regret I cannot for their sake add from personal experience the cost of converting jungle land into paddy fields, but I may state that my enquiries go to show that a capital outlay of R40 would be sufficient including the purchase from Government at ordinary upset price.

I could write much more as to my views on Paddy Cultivation, but this lies outside the intention of this letter, and so I shall add no more at present.—Yours faithfully, E. ELLIOTT.

IS FORKING OR DIGGING ABOUT TEA ADVISABLE?

THE RESULTS OF PRACTICAL EXPERIENCE ASKED FOR.

Central Province, Nov. 25th.

SIR,—As perhaps you are aware, there is very great diversity of opinion on the benefit or otherwise of forking or digging tea. It could not but prove very valuable information, if some of the many planters who have forked fields of tea would communicate the results.

My own experience has proved (1) that it is a sure way of checking flush for a good three months, if resorted to when the tea is six to eight months from pruning (*e.g.* in full flush); (2) that there has been no marked improvement at any subsequent period.

Theoretically, forking is a permanent improvement to the soil; but from my own experience of the result, I shall not again have recourse to it except in every other line, say three weeks before pruning (given favourable weather).

Trusting the ventilation of this subject may prove more profitable than my experiments in the ventilation of the soil, I am, sir, your obedient servant,

PERVERT.

[We shall look for an expression of opinion by other practical men who have had experience in "forking."—ED. *T. A.*]

THE WATCH COMPASS.

DEAR SIR,—I think the Yankee who taught us the use of the watch as a compass was a genuine son of his country, and wise as well as 'cute. To dwellers in northern latitudes the sun is always south at noon, hence his selection of the south point. The one thing to be guarded against is—not to hold the watch horizontal, but so that the hour-hand points directly at the sun. In northern countries the sun is never vertical, and therefore *there* the watch could never be "made to point upwards directly towards the sun, and made to revolve round the hand &c., &c." In sub tropical countries, however, this is possible and renders the watch of little value as a compass in March and April, and in September and October or until the sun attains a sufficient north or south declination to throw a shadow of the hour-hand on to the watch face. It is this shadow which guides the observer in holding his watch, and enables him to find approximately all the points of the compass. The watch will thus adjust *itself* to the plane of the sun's daily path. In Ceylon from April to August the hour-hand should be made to point directly *away from the sun* as indicated by its shadow. At least it is but approximate and does not show mean noon, but so far as it goes it is an interesting fact, and may often be useful. The rim of the watch face, when held as directed, is a small circle concentric to the plane of the sun's daily path; or, when laid flat, concentric to the horizon. Hence, when seeking an "explanation," I imagined the offing reduced to the size of the watch, or the watch face enlarged to the size of the offing. But by keeping the hour hand pointing to the sun (as it must be for correct results in all latitudes above 25°N) the sun's motion is seen to be quite regular.

ASTRO.

COFFEE IN THE NEILGHERRIES.—The *Madras Mail* article on coffee planting in these hills remarks that the consumption by the natives of India is increasing, and if it becomes general the local price of coffee must rise considerably. It will appear that the prospects of coffee cultivation in India on good soil are encouraging. The only country in which it seems possible to cultivate coffee more economically than in India is Africa, but competition from that quarter must take time.—*Pioneer.*

AGRICULTURE A "MERCANTILE UNDERTAKING."—In connection with the question of a loan under the Agriculturists' Loans Act, which the Collector of the Nilgiris had granted to a coffee planter, the Board of Revenue recently made the astounding statement that the loan had been illegally granted under the Act because "the land on which coffee is planted does not fall within the designation of arable. Coffee-planting is rather a mercantile undertaking than an agricultural operation, and it is obvious that any measure which would tend to make Government a sleeping partner in such a mercantile undertaking is undesirable." It is satisfactory to note that Government does not share this extraordinary view, and is of the opinion that land on which coffee is planted comes within the designation of arable land contained in the Act in question.—*Madras Mail*, Nov. 20th.

SALE OF TEA COMPANY'S SHARES.—We hear today of the sale of 50 shares in the Yatideria Tea Company for R140—a very fine price considering that this Company is quite a young one and has not yet paid a dividend. The shares are R100 fully paid up, and the price paid shows how confident investers are that the position of the company is a strong one. The first dividend is shortly expected, and it will be a good one we believe.—Local "Times."

STARTLING FIBRE STATISTICS.—The American people are no less profuse in clothing than in food. The country is a favored land in fibre production. More than $300,000,000 is the comfortable sum which represents the present fibre product, in the form of cotton, wool, hemp and flax. There is also experimental production of silk, ramie, sisal, jute and many others suited to the climate, some of which will ultimately become the foundation of industries. More than half of the material for the cotton factories of the world is grown here, and a third of that is manufactured and mostly consumed at home. If 65,000,000 people require one-sixth of the cotton manufactured in Europe and America for the use of nearly 450,000,000 inhabitants of these continents, and of the millions in India, China, Japan and other countries obtaining supplies from the factories of Christendom, the disparity in consumption between this and other countries must be great indeed.—*Agricultural Journal.*

CEYLON EXPORTS AND DISTRIBUTION 1890.

COUNTRIES.	Coffee cwt.			Cinchona	Tea.	Cocoa.	C'moms.	Cinnamon.		Coconut Oil.		Pl'bago.
	Plantation	N'tive	Total.	1890 B'nch & Trunk lb.	1890 lb.	cwt.	lb.	Bales lb.	Chips lb.	1890 cwt.	1889 cwt.	1890 cwt.
To United Kingdom ...	52563	100	52663	7472145	39155893	9588	137566	1020681	237635	85500	103980	144256
" Marseilles	157	...	157	12500	762	80	...	105960	8800	[illegible]	...	...
" Barcelona	...	...	...	...	1150	...	...	35000	...	...	...	...
" Genoa	12	...	12	...	2254	...	...	66425	29424	3422	2678	1134
" Venice	71	232	303	70412	2455	...	...	11100	11200	...	202	...
" Trieste	7830	97	7927	252	3090	...	7393	3900	[illegible]	16477	10239	...
" Odessa	32	...	32	...	275	...	...	...	...	8062	5415	...
" Hamburg	296	...	296	730	38071	814	1131	278900	91972	18777	7665	34844
" Antwerp	17	20	37	217919	1600	...	...	19500	5600	1161	1492	13949
" Bremen	20	...	20	...	15987	151	...	25096	...	...	...	6291
" Havre	...	100	100	...	4761	8	...	10000	...	2007	4578	...
" Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
" Africa	16	...	16	...	38082	...	...	5000	...	8	34	...
" Mauritius and Eastward	277	333	610	...	91350	498	...	28500	...	41265	2508	...
" India	1041	718	1759	...	111595	...	161504	7220	...	78571	42871	256
" Australia & New Zealand	10021	1218	11239	...	2104332	9	40	8474	336	1213	1944	406
" America	1924	...	1924	401893	194158	1653	4956	89228	...	46061	100773	127975
" Stockholm	...	...	...	...	1703	...	...	...	...	...	...	...
" Constantinople ...	...	...	...	...	3122	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 1st Dec. 1890	74280	2818	77098	8197235	41770640	12856	312590	1714984	420615	305534		330727
Do 1889	65829	4388	70336	8726496	30457296	13029	276773	2174798	486320	281943		413970
Do 1888	119207	5499	124706	12131962	20885168	10486	232694	1542480	419530	331557		231987
Do 1887	152691	7781	160720	10998462	11693478	14468	279133	1414301	261672	264006		206531

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis Peat's London Price Current, November, 6th 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	Slightly softish to good Hard bright... ..	£5 10s a £7 10s
Yellow ...	Do, drossy & dark ditto...	95s a 110s
CINCHONA BARK--Crown per lb.	Renewed	3d a 1s
	Medium to fiue Quill ...	4d a 9d
	Spoke shavings	2d a 9d
	Branch	1d a 3d
Red	Renewed	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings	2d a 5d
	Branch	1d a 31
	Twig	1d a 1½d
CARDAMOMS Malabar	Clipped, bold, bright, fine	1s 8d a 3s 6d
and Ceylon	Middling, stalky and lean	10d a 1s 6d
Alleppee	Fair to fine plumpclipped	1s 4d a 3s 4d
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good.& fine, washed, bri	1s 6d a 3d
Long Ceylon	Middling to good... ...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill ...	7½d a 1s 7d
2nds	,, ,, ,, ,, ...	7d a 1s 4d
3rds	,, ,, ,, ,, ...	6d a 1s 2d
4ths	Woody and hard	5½d a 10d
Chips ...	Fair to fine plant... ...	2½d a 7½d
COCOA, Ceylon	Bold to fine bold ...	100s a 110s 6d
...	Medium	90s a 98s
	Triage to ordinary ...	55s a 85s
COFFEE CeylonPlantation	Bold to fine bold colory...	108s a 114s
	Middling to fine mid. ...	105s 6d a 107s 6d
	Low mid. and Low grown	100s a 104s 6d
	Smalls	100s a 106s 6d
Native	Good ordinary	92s a 98s
Liberian ...	Small to bold	85s a 92s
East Indian ...	Bold to fine bold... ...	105s a 115s
	Medium to fiue	100s a 105s
	Small	95s a 100s
Native	Good to fine ordinary ...	92s a 98s
COIR ROPE, Ceylou&Cochin	Mid.coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£15 5s a £28
Stuffing ...	Coarse to fine	£5 a £18
COIR YARN, Ceylon ...	Ordinary to superior ...	£13 a £30
Cochiu ...	Ordinary to fine	£12 a £36
Do	Roping fair to good ...	£12 a £15 10s
COLOMBO ROOT sifted ...	Middling wormy to fine...	18s a 27s 6d
CROTON SEEDS, sifted ...	Fair to fine fresh... ...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold... ...	50s a 65s
,,	Small and medium ...	26s a 39s
Rough	Fair to fine bold	18s a 25s
,, ...	Small	16s a 21s
GUM ARABIC, Madras ...	Dark to fine palo ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	10s a 12s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES, pale ...	Good to fiue picked ...	10s a 10s 9d
	Common to middliug ...	8s 9d a 9s 3d
	Fair Coast...	9s a 9s 6d
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	11-16d a ¾d
LEMON GRASS ...	,, ,, ,, ,, ...	1¾d a 1⅞d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	4⅝d a 4¾d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White ...	,, ,, ,, ...	1s 1½d a 1s 2d
PLUMBAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright ...	5s a 9s
RED WOOD	Fair and fine bold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to fine flavor ...	£30 a £58
Do. chips ...	Inferior to fine	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	7½d a 8¼d
	Fair middling medium...	3d a 6 i
	Commou dark and small	1d a 2½d
TURMERIC, Madras ...	Finger fair to fine bold	16s a 18s
Do. ...	Mixed middling [bright	15s a 16s
Do. ...	Bulbs	10s a 12s 6d
Cochin ...	Finger	11s a 12s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	16s a 23s
2nds	Foxy & reddish 5 a 8 ,,	13s a 18s
3rds	Lean & dry to middling under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
ALOES, Socсotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic ...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	36s a 42s
	Ordinary and middling...	28s a 31s
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright ...	4¼d a 4½d
	Common dull to fair ...	3⅝d a 4⅛d
Stems...	Common to good ...	⅞d a 15-16d
COCULUS INDICUS ...	Fair ...	12s a 13s
GALLS, Bussorah & Turkey ℔ cwt.	Fair to fine dark blue ...	52s 6d a 58s 6d
[cwt.	Good white and green...	40s a 47s 6d
GUM AMMONIACUM per	Blocky to fine clean ...	20s a 80s
ANIMI, washed, ℔ cwt.	Picked fine pale in sorts,	£13 a £15s
	part yellow and mixed	£10 a £13
	Bean & Pea size ditto ...	£5 a £8 10s
	amber and red bold ...	£10 a £12
scraped...	Medium & bold sorts ...	£5 a £8
ARABIC E.I. & Aden ..	Sorts	32s a 90s
per cwt. Ghatti ...	Sorts to fine pale ...	20s a 65s
Amrad cha	Good and fine pale ...	50s a 87s
	Reddish to pale browu ...	25s a 45s
ASSAFŒTIDA, per	Clean fair to fine ...	26s a s 50
cwt.	Slightly stony and foul ...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 30s
MYRRH, picked ,,	Fair to fine pale ...	£5 a £7 10s
Aden sorts	Middling to good ...	62s a 80s
OLIBANUM, drop	Fair to fine white ...	32s a 55s
per cwt. ,,	Reddish to middling ...	22s 6d a 30s
pickings...	Middling to good pale ...	14s a 20s
siftings ...	Slightly foul to fine ...	10s a 11s 6d
INDIARUBBER Mozambique,	red hard ...	2s a 2s 4d
per lb. Ball & Sausage	white softish ...	1s 5d a 2s
	unripe root ...	1s a 1s 8d
	liver ...	1s 3d a 2s

FROM CALCUTTA AND CAPE OF GOOD HOPE.	QUALITY.	QUOTATIONS.
CASTOR OIL, 1sts per lb.	Nearly water white ...	4d a 4¼1
2nds ,, ...	Fair and good pale ...	3¼d a 3⅞d
3rds ,, ...	Brown and brownish ...	3¼d a 3½d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 3d
	Common foul and mixed	9d a 1s 8d
Rangoon ...	Fair to good clean ...	1s 10d a 2s 3d
Madagascar	Good to fine pinky & white	2s 7d a 2s 8d
	Fair to good black ...	1s 9d a 2s 1d
SAFFLOWER ...	Good to fine piuky ...	50s a 60s
	Middling to fair ...	40s a 45s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	9s 6d a 10s 6d
	Stony and inferior ...	4s a 6s

FROM CAPE OF GOOD HOPE.	QUALITY.	QUOTATIONS.
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	22s 6d a 24s
,, Natal ...	Common & middling soft	12s a 21s
...	Fair to fine ..	none here
ARROWROOT Natal per lb	Middling to fine ...	2d a 3d

FROM CHINA, JAPAN & THE EASTERN ISLANDS.	QUALITY.	QUOTATIONS.
CAMPHOR, China, ℔ cwt.	Good, pure, & dry white	152s 6d a 160s
Japan ...	,, ,, pink	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	36s a 6d
	Pressed	Nominal 31s
Block [per lb.	Good ...	22s 9d a 23s
GUTTA PERCHA, genuine	Fine clean Banj & Macasar	3s 6d a 5s
Sumatra...	Barky to fair	2s a 3s 9d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	2s a 3s
	Inferior and barky ...	1s 4d a 2s
NUTMEGS, large, per lb...	64's a 80's, garbled ...	2s 10d a 3s 3d
Medium ...	83's a 95's ...	2s 8d a 2s 9d
Small ...	100's a 160's ...	1s 5½d a 2s 7d
MACE, per lb. ...	Pale reddish to fine pale	2s 6d a 2s 11d
	Ordinary to fair ...	2s 2d a 2s 4d
	Chips and dark ...	1s 11d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 3d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fiue ...	10d a 1s
	Dark, rough & middling...	3d a 7d
SAGO, Pearl, large, ℔ cwt.	Fair to fiue ...	13s 6d a 15s 6d
medium ...	,, ,, ,, ...	12s 6d
small ...	,, ,, ,, ...	10s a 11s
Flour [per lb,	Good pinky to white ...	9s a 9s 6d
TAPIOCA, Penang Flake	Fair to fine ...	1⅞d a 2¼d
Singapore ...	,, ,, ...	1¼d a 2d
Flour ...	,, ,, ...	9d a 15s
Pearl ...	Bullet, per cwt. ...	18s 6d
	Medium ,, ...	15s 6d a 17s 6d
	Seed ,, ...	16s a 16s 6d

THE

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THE CEYLON AND ORIENTAL INVESTMENT CORPORATION, LIMITED.

WE have now received from the Managing Director, Mr. J. Huntley Thring of Alford, Castle Cary, Somerset, and Dimbula, Ceylon, a copy of the prospectus of this newly-formed Association. Mr. Huntley Thring is associated with men of high commercial standing in the City in Mr. Arbuthnot of Messrs. P. Macfadyen & Co., Mr. Hancock of Messrs. Hancock Brothers & Co., Mincing Lane, Mr. Reiss of Messrs. L. Reise Brothers & Co., and Mr. Cyril E. Johnston who was of Messrs. Edward Johnston, Son & Co., the largest exporters of coffee from Rio and who has one brother Deputy Chairman of the London Westminster and another brother Director of the Joint Stock Bank. The capital of the Company is fixed at so large an amount as £250,000 divided into 49,950 ordinary shares of £5 each and 250 Founders' shares of £1 each. The first issue of 9,950 ordinary, and 250 founders' shares, has, we learn, been already taken up. Five hundred shares are reserved for Ceylon and Mr. Huntley Thring, who will arrive here before Christmas, will represent the interests of the Company, along with Mr. E. G. Harding who will probably have the Colombo agency, and Mr. A. J. Denison. The New Oriental Bank will be Bankers. That such a Company should be organised and floated in the face of the commercial crisis London has just passed through, speaks well for the high credit of Ceylon and especially of her tea industry. It is in connection with the latter, of course, that the Corporation will be most concerned, establishing probably an extensive estate agency business; but very large powers are taken by the Directors which would enable them, if advisable, to take up any profitable Ceylon investments, such as Tramways or a short line of Railway, &c. There is at present, no Trust Association on a large scale operating in Ceylon and seeing how our tea industry is really still in its infancy, there should be plenty of scope for the Corporation, in the hands of Directors so sagacious and influential, doing a large and profitable business. That such is the anticipation may be judged from the following extract from the rule laid down for the guidance of the Directors:—

"The Founders' Shares will receive no dividend in any year until the Ordinary Shares have received 8 per cent. dividend for that year. After provision for a Reserve Fund and payment of 8 per cent. dividend on the Ordinary Shares, the Founders' Shares will (subject to the Memorandum and Articles of Association) be entitled to one moiety of the remaining net profits and the Ordinary Shares to the other moiety. Every allottee of 50 Ordinary Shares will be entitled to subscribe for and have allotted to him one Founders' Shares at a premium of £5; such premium to be applied in payment of all the preliminary expenses incidental to the formation of the Corporation."

The Prospectus—which will shortly be advertised in full in our columns—begins by stating that the "Corporation is established to deal mainly with Ceylon and Indian properties and Securities in the same manner and on the same lines as other Financial Companies have successfully dealt with General Securities." It then proceeds to refer to the rapid development of the Tea Industry, quoting Statistics from our "Ceylon Handbook and Directory" which stand out in bold relief, namely,—

Export of Tea.

1879..	95,969 lb.
1889..	34,345,852 „

[And who will venture to deny the probability of 1899—recording even more than 80,000,000 lb.]
We next read in the prospectus:—

The Tea Gardens of Ceylon being for the most part young, and not yet having reached maturity, are daily increasing in value and productiveness. The evenly distributed rainfall combined with the tropical climate causes the Tea bushes to "flush" almost continuously throughout the year, thereby bringing the average cost of production to even less than that of India while owing to the preference given to Ceylon Tea throughout England and the Colonies, the average price obtained is higher. It is not proposed to purchase properties except under special circumstances but to grant loans on the security

of Mortgages of Tea and other Estates and so to secure the consignment of the crops to the Corporation for sale, and it is anticipated that the mortgage interest and the commission on the sale of the produce will enable the Corporation to earn substantial dividends. As evidence of the profitable nature of Tea Growing in Ceylon, it may be mentioned that the Ceylon Tea Plantations Company, Limited, which was incorporated in December, 1886, has, for each of the three years since its formation, declared dividends amounting to 15 per cent. per annum.

There is then reference made to Mr. Huntley Thring's local experience and high character as affording a valuable guarantee for the success of the Corporation, and in every word of praise of the Managing Director we most fully concur; for no one is esteemed more highly among the Ceylon planting community, while he will have experienced and shrewd coadjutors in Messrs. E. G. Harding, A. J. Denison, and C. Murray Robertson. We wish the new Corporation all success.

HILL-COUNTRY PLANTING REPORT.

A VISIT TO THE KOTAGALOYA VALLEY—TEA A SUCCESS ON ABANDONED COFFEE ESTATES—HEDGES OF TEA.

NANUOYA, Nov. 19th.

With reference to my visit to the Kotagaloya valley (the name is derived from the resemblance of the "Duke's Nose" mountain, seen in profile, to a leopard *couchant*), I cannot help repeating my conviction that tea will be here as great a success as coffee was generally a failure, Passing through "Chrystler's Farm" *en route* to the station, we were struck with the splendid jât (indigenous, or as near it as possible) of young tea and its luxuriant growth. A really great work in the shape of a watercourse tapping the distant river was also remarkable. Factories are being erected in all directions, and the larger proportion of abandoned coffee estates are being redeemed. On an estate nearer the station, fine hedges of tea, topped at over 4 feet, which lined both sides of the road, formed striking features in the landscape. I thoroughly believe in the system. The bushes on the lower side of the path get the benefit of the heaped soil, while those on the upper side catch and are benefited by all *débris* of earth, leaves and prunings from above. Yesterday I went up the railway line to the third mile, and found that Mr. Wijenayeke had made considerable progress in blasting away the remarkable bed of rock at that point. He had obtained miners from the plumbago pits of the Kurunegala district, and had sixty at work boring holes and blasting. Ten of these, for the sake of extra pay, which they receive each day in ready cash, do a second task in the evenings of each day. The day-task, averaging 7 feet (one exceptional miner accomplishes 15 feet) is completed about 3 p.m., After refreshment, the evening task, averaging about 5 feet, is performed between 4 and 7 to 8 p.m. The work here takes more time and more dynamite and blasting powder, and is therefore more expensive than would be the case were the rock more granitic than it is. But it is true gneiss, in laminæ of about 2 feet thick, so that the holes bored in each stratum affect only the thickness of that particular layer. Some more or less decomposed matter intervenes between the hard strata. This rock obstacle to progress has its advantages. An enormous depôt of broken stone has been here formed, which, when trollies or trucks are able to run, can be conveyed along the line to where metal for ballasting is scarce. The feeling amongst the contractors is that delay at the lower end of the line is more likely to occur from paucity of metal for ballast than from any other cause. A gentleman who has a contract of two miles of rocky precipices near the Haputale end was much impressed with the almost exclusively earth formations at our end, especially in Mr. A. H. Thomas's great cutting on Abbotsford, which is now fast advancing to completion. The only rock here is in the shape of isolated boulders embedded in the earth. We were present at the undermining and loosening of one of those boulders from a position halfway up the 80 feet slope of ¾ in 1, and we felt real alarm at the recklessness of the coolies. One man *would* stand on the mass (about 3 tons in weight), while several would go under it, to undermine it with their alavangus. It was held in position by a sharp neck which went well into the bank, and which at length broke and released the boulder, enabling it to crash down harmlessly. The only accident on this big work, although operations have gone on in the night hours as well as by day, has been the fracture of the leg of a man who *would* stand on a mass of moving earth and got carried down with it. But of people aggregated in numbers some will die from disease, and one grave after another appears as time advances along the service road. Yesterday morning I saw a newly formed mound near Mr. Wijenayeke's contract, on which a bit of tin with pieces of charcoal had been placed, while marigolds had been planted around it. Such little attentions (although I fear the charcoal meant the conciliation of some god or demon,) shew the best side of human nature. But its weak side is shown by the grave of a little child close to our great cutting. The child died six miles up the line, but the body was brought down for burial by the parents avowedly for the purpose of being placed "where passengers by the railway might see the grave"! It is a curious fact that, no matter what the religious profession of the people, they very generally place a cross over the graves of their dead.

USEFUL TREES—BIRDS IN NUWARA ELIYA.

NANUOYA Nov. 21st.

Populnea Bucklandia (a grand relative of the Suriya tree) promises to be a great acquisition with us. We measured a couple of thick leathory leaves from young specimens which were a foot each way. The point projects from an almost perfect circle. The behaviour of different *Eucalypti* in our climate is curious. Most of our young plants have grown luxuriantly and did not seem to feel the recent south-west monsoon, while others have now practically to renew the whole of their foliage. Those trees grow under such different circumstances of climate in their native *habitats*, that it is only surprising how well most of them do here.

It would seem as if teal had not found their way up to Nuwara Eliya, after all. The specimen I received at Nuwara Eliya I saw only as a plucked bird, and all who spoke to me about the birds which had been so ruthlessly shot, called them teal. But last evening I received the following note from Mr. W. Tringham:—

"I hope the Local Board Ordinance will contain a clause giving the Boards power to pass bylaws for the protection of wild birds. The teal or widgeon are breeding on the lake. A little one was caught last evening the size of a frog, and I have sent it to Mr. LeMesurier this morning. Another nest was discovered, but the eggs were riddled with shot as the bird was killed as it rose from the nest. It is a great pity, but the report that a couple of teal were seen near the lake brings down the sportsmen in flocks." Enclosed came a note from Mr. Le Mesurier to the following effect:—

"This is not a teal or widgeon, but a dabchick or little grebe. I caught one myself on the lake not long ago, while in company with its mother, but let it go again. Teal would breed here, I have no doubt, if let alone."

On turning to Legge's book, I find that the little grebe had found its way up to Nuwara Eliya a good many years ago. He writes:—"The dabchick is widely distributed throughout the lowcountry of Ceylon, besides which it has, I am informed, recently found its way up to the Nuwara Eliya Lake, which has an altitude of 6,200 feet. It is nowhere seen in larger numbers than on the Colombo Lake, where it is a permanent resident; on some occasions I have seen a flock of more than thirty on the larger sheet of water, and, as a general rule, there are a dozen or more in this locality. It is not uncommon in the tank districts from Kurunegala northwards, and I have met with it in small village tanks near Trincomalee. Its having ascended the highest mountains in the island and discovered the newly constructed Lake at Nuwara Eliya is very remarkable, as there is a rise to the plateau, both on its eastern and western side, of more than 2,000 feet, both streams flowing down precipitous and forest-clad gorges; but I am credibly informed by several people, and among them by Mr. Thwaites, of Hakgala, who pays particular attention to the birds of the district, that it *has* been seen there during the cool season." Legge adds that the bird is a most expert diver and that its note is a not unmusical whistle. From the testimony of Messrs. Le Mesurier and Tringham, it appears to have bred in Nuwara Eliya, so that, if properly protected, the Lake would have the attraction of flocks of the little grebe, with other aquatic birds, no doubt, on its bosom. It would be a thousand pities if the unregulated action of sportsmen should exterminate or frighten away these pretty and interesting birds. The amount of meat they yield cannot be a great temptation.

FINE SPECIMENS OF ALBIZZIA MOLUCCANA—THE MERITS AND DEFECTS OF THE ALBIZZIA—JAPANESE TIMBERS FOR TEA CHESTS—AN EXPERIMENTAL GROVE IN UDAPUSSELLAWA—THE "TALLOW WOOD" TREE AND THE KUMBUK FOR RAILWAY SLEEPERS—GUMS, GREVILLEAS, &C.—AFFORESTATION AT AND IMPROVEMENT OF NUWARA ELIYA.

NANUOYA, Nov. 25th.

I recently mentioned the truly noble growth of some specimens of *Albizzia moluccana* here, which are only nine years old. Those in Mr. Neate's garden at Nawalapitiya, which that gentleman kindly asked me, some time ago, to inspect, are, I believe, one, or perhaps two years older? Mr. Neate obtained the seed, probably, through the late Colonel Money. Not having been able to accept Mr. Neate's invitation to see his grand trees near at hand, I was glad to obtain the measurements taken by Mr. Alexander of the Forest Department. There are five trees which vary in girth from 64 to 71 inches, or practically 6 feet in the latter case! The height of the trees is from 90 to 100 feet. Mr. Munton, I am told, has similar trees in the Matale district; and I remember seeing a fine specimen in flower on Rosencath estate near Kandy. The foliage of these trees so closely resembles that of the Madagascar tree, *Poinciana regia*, that the two trees are frequently confounded. But the blossoms differ exceedingly: those of the *poinciana* being grand in size and colouring while the flowers of the *albizzia* are smaller and beautifully snow-white. Athough the spreading roots of this tree often vie in size with its immense trunk and large branches, it seems to do little or no harm to tea when growing amongst fields of that plant. Its great merits as a shade and shelter plant, are qualified by its brittleness, big branches being broken by the wind or falling down occasionally by their own weight. Many specimens, however, either grow unbrageously or shoot up tall and straight and are perfect specimens of grand trees. The timber is, evidently, not suitable for building purposes or fuel, but it would, no doubt, be excellent for tea boxes.

And this reminds me, that, after all, it was of "momi" I wrote recently as giving out no odour, when being planed by the carpenter. It resembles fine spruce deal, some of the pieces showing very beautiful markings, in parallel lines and wavings. I took it to be the wood of *Cryptomeria japonica*, from its close resemblance to that of the specimen of this so-called "cedar," which Mr. Nock recently cut down at Hakgala. That did not strike me as showing any dark heart-wood, but probably it was not old enough to develope a characteristic which is attributed to the mature cryptomeria. Of "Sugi" or the Japanese cedar, I have full details in Von Mueller and Gamble, but nowhere have I been able to find "Momi." From the appearance of the wood, it must be either a cupressus or pine, most probably the latter?

Mr. Alexander had, when he came to have a look at our older trees and our flourishing young plantings, just returned from visiting a Government plantation of Grevilleas, Eucalypts, &c., in Udapussellawa. All the trees in this experimental grove were doing well, but the tree which had grown beyond all compare was *E. microcorys*, one of the "stringy barks" of New South Wales and Queensland, and known by the colonists as "tallow wood." A specimen only 8 years old measured by Mr. Alexander was 64 inches (5 feet 4 inches) in girth and tall in proportion. The Forest Department have, in consequence of such growth and the known qualities of the timber, ordered a large supply of the seed of this tree. Von Mueller describes it as attaining to a great size; barrel up to 100 feet in length and to 7 feet *in diameter*! The wood is yellowish, free from kino particles, easily worked by saw or plane; it is of a very greasy nature, so much so as to be quite slippery when fresh cut. (Hence no doubt its popular name of "tallow wood.") The oily substance prevents the wood from splitting or twisting, though not from shrinking. The timber is hard and durable underground, and *is employed for railway sleepers*, wheelwrights' work, for knees and breast-hooks in ship-building; the *young trees serve for telegraph poles.* [This points to planting pretty closely, thinning for telegraph poles and like purposes, and leaving the finest trees wide apart to grow until suitable for conversion into railway sleepers.] The foliage is remarkably rich in volatile oil. In some parts of India this tree has grown 30 feet in two years, or at the rate of 15 feet per annum, 1¼ foot per mensem, or ½ inch per diem. In British Guiana the growth was still more rapid, up to 18 inches in one year! This tree is likely to be a great acquisition in Ceylon, especially if the railway department accept the timber for sleepers. At present the only hard wood grown in Ceylon which finds ready acceptance for use on the railway is the product of a tree peculiar to Ceylon, the *doon*—the red variety being preferred. *Kumbuk*, which grows to such an enormous size on the banks of streams, is also to be tried in considerable quantity. I will be much surprised if the timber of this grand tree is not favourably reported on, but many of our rivers will suffer in picturesqueness by the denudation which will follow the extended use of the timber. In some of the very aged specimens on the banks of the Arivi-aru in the North-Central Province, there are caves in which human

beings as well as whole families of wild animals might find lodgement. The mode in which fresh bark forms continually on the edges of hollows in the trees is most remarkable. The blossom of these fine, waterloving trees, with their thick bark, rich in lime, is beautiful and sweet-scented.

I remember well the time, not more than 15 or 16 years ago, when poor George Smith planted *Eucalypts*, *Grevilleas*, *Araucarias* and *Cupressus torulosa* around the then newly-built bungalow of Dessford. Last evening I was able to compare, or rather to contrast, the gigantic height and the corresponding girth of the trees with their size when planted. Some of the tall, straight, clean, columnar "gums" are over 100 feet high and stout of stem in proportion. Others are magnificently umbrageous. The Grevilleas are only second to the Eucalypts (one of which seems to be *E. amaygdalina*, the tallest tree in the world) in upward growth. The soil on the comparative flat is good, the elevation under 5,000 feet, and the position is largely sheltered, so that all the conditions are favourable. Mr. Rosling's experience of blue gum timber (unseasoned) was similar to our own: it warped. It ought not, really, to be used for buildings, until six months after felling. But we were greatly interested in a large stable door, composed of fine plants of a Grevillea tree, certainly not more than 16 years old (if that), which had been cut down and converted into timber. Made into the door, when freshly sawn, this valuable wood had subsequently seasoned without in the least warping. Such being his experience, we were not surprised to learn that Mr. Rosling intended to cut down some of the older Grevilleas which can be spared from the large number on Lorne, to be converted into floor boards. *Grevillea robusta* is certainly, for beauty of foliage, for tenacity of vitality (it scarcely ever fails in planting), for fair rapidity of growth and value of timber at a comparatively early age, one of the most valuable gifts which Australia has bestowed on Ceylon. It flourishes from sea-level to 6,000 feet, and we do not wonder at its great popularity and wide diffusion. If a *casuarina* or a *frenela* is allowed to grow somewhat big in the nursery, it almost infallibly dies when planted out, while the Grevillea flourishes equally as a seedling, a well-grown plant, or as a "stump." Prizing as we do our beautiful Norfolk Island pines, with their whorls of horizontal branches surmounted by a cross (one of them has here attained over 40 feet in 10 years), we were sorry to hear from the forest officer, that they were dying in several places. By the way, my surmise was correct that the planting baskets we saw being carried from Nanuoya to Nuwara Eliya, were intended for the use of the Forest Department.

Of the attempts at afforestation near the Sanatorium, Mr. P. C. MacMahon, in a letter to a contemporary of yours, does not speak so favourably as he does of a large scheme of improvement for our Mountain Health Resort, which he thus formulates:—

For the purpose of taxation and the working of rules relating to thatched buildings, etc, "Abram Saibo's bridge" is taken as the centre of Nuwara Eliya. All properties—including *forest land* from there to the top of the Rambodde Pass, Black Pool bridge, Mrs. Baker's gate, and the Hewa Eliya bazaars—have to pay assessment, all those points being, in a straight line, over two miles from the bridge. Now, on the North side, Government have conveniently for themselves drawn the Local Board boundary immediately below the whole of their forest, the nearest point of which is not more than a ½ mile from the bridge, while fully 500 acres are within the radius of 1½ miles; consequently, they get off without paying tax, though one of the principal public duties of the town Aratchi and the Nuwara Eliya police is its protection! What I propose is that Government hand over to the town the whole of the forest from the top of the Rambodde Pass to Pedru, and from there to the Lover's Leap falls as their forest reserve and future park, and that the Board gradually improve it by cutting new roads, planting suitable trees, foreign ferns, orchards, &c. In this way Pedru would become, as it should be "part and parcel" of the town, and its noble stretch of forest saved from the systems of "forestry" which one sees along the Nanuoya road, and which is much more calculated than the planting of the tea bush to diminish the attractions of Nuwara Eliya. The road, too, to Pedru could be widened and kept in proper repair—which cannot be done now by the Board as it runs for the greater part of the way through Government forest—and seats placed along it at the principal points of vista where, the weary climber may rest here or his tired limbs and admire the scenery round. Lastly, close to the top of Pedru, a Kandyan pavilion should be built where ladies could hold picnics and shelter be found from the sun and rain. I do not agree with that part of the Report which states that the attractions of Nuwara Eliya are diminishing. Ten years ago the old Resthouse was sufficient to accommodate all the visitors and planters coming to the place; now we have two large Hotels and a Club—all doing fairly well; and, if returns were collected from these, I have no doubt that the flow of visitors is increasing 10 per cent yearly at least. As regards the block which Government failed to get at their price, I think I may state that the "attractions" of Nuwara Eliya will lose nothing by their failing to secure it, and that in the march of progress of the place it will keep pace with those which they have lately purchased—not a very difficult matter, judging by what has been done to and around of Government bungalows here for the last ten years.

In propounding his large scheme of extending the boundaries of the Local Board of Nuwara Eliya so as to include the forested slope and cloud-piercing summit of the loftiest mountain in Ceylon, the Celtic "son-of-a-bear" (for such is the translation of his patronymic) might have been magnanimous enough to have acknowledged that Mr. Armitage's success at the base of Pidurutalagala has been as conspicuous as his failures towards Nanuoya have been regrettably great. But we can all of us imitate Beau Brummel, when speaking of his cravats, in saying, "These are our failures." Let us hope that the dredging operations and water supply works at Nuwara Eliya may be unqualified successes.

Nov. 26th.

I wrote yesterday of an atmosphere surcharged with moisture and of the north-east wind blowing strongly. The result was the commencement of a rain-storm about 1 o'clock, which continued until nightfall. The rain-gauge record is 1·47 inch. This morning rises fine, but with masses of cloud on the eastern horizon.

NO SUCH THING AS WATER POWER—VARIOUS METHODS OF UTILIZING WATER—TURBINES—MOISTURE IN THE AIR—DIFFERENCES OF RAINFALL—WELLS—WATER SUPPLY—A CHANGE TO FINE WEATHER—THE LOFTIEST MOUNTAINS IN CEYLON—MR. NOCK'S EXPERIMENTS WITH POTATOES—GRUB—REMEDY FOR GREEN BUG.

NANUOYA, Nov. 25th.

With reference to possible aid in regard to the Nuwara Eliya Water Supply Works, Mr. W. Tringham has asked me to return a book he was good enough to lend me, and which I have read with very great interest. It is a special volume of the proceedings of the Institute of Civil Engineers, containing papers on the Theory and Practice of Hydro-Mechanics, and dealing with Physiography, Water Supply, Water Motors, Inland Navigation in Europe, Tide and Coast Works, and Forms of Ships. What struck me specially was the proposition, so startling to the popular mind, by the author of the paper on water-motors, that there is, strictly speaking, no such thing as water-power. What we are in the habit of attributing to the impact and weight of descending fluid on waterwheels is due entirely to gravity! However startling such a statement may seem, I suppose the scientific principle is beyond doubt. But les

I should have misapprehended or misstated its effect, I quote the paragraph from Professor Unwin's paper:—"The term water-power is convenient but inaccurate. Strictly speaking there is no such thing as water-power. Whether the water descends on a water-wheel, or actuates a pressure engine in connection with Mr. Ellington's pressure mains, the water is a mere agent of transmission. In the one case the water-wheel is driven by the energy of gravitation, in the other by the energy developed in a steam engine; the water merely transmits the pull of gravity, or the push of the steam engine. In neither case is the water itself the source of the power utilized. As we speak of a steam engine as a heat-motor, so we might speak of most water-motors as gravity-motors," Another principle is thus stated:—"The ordinary source of water-power is a supply of water raised by the sun's heat to a convenient elevation, and falling through natural channels back to the sea," and then follow mathematical proofs. It is fortunate for us in Ceylon, that, in the absence of coal and the increasing scarcity of wood fuel in convenient situations, water thus returning to the sea is so generally present in a form easy of utilization, especially in our hill regions. Professor Unwin states even of Britain, that "No great increase of the price of coal is needed to make water power of much more value than at present. On the other hand if the electrical engineer will make the transmission of energy easier, the importance of water-power would also increase, for one of its greatest defects is that it exists in the localities where nature has placed it, and not in the places where it can be most conveniently used." The author believes that the electrical transmission of water-power would be common, if a diminution of the cost of electrical apparatus took place. On the Continent of Europe and especially in America, water-power is very largely utilized, and at Holyoke, below the rapids of the Connecticut river, water power is supplied to mills at the rate of 20 shillings per horse-power, per annum,—the cheapest manufacturing power in the world. While I believe in *good* turbines where considerable power is required, and skill and intelligence are readily available, we have always had much faith in the common and simple overshot-wheel for ordinary purposes. Two such wheels, equal to 8 or 9 horse-power are sufficient for most tea factories. I again quote Professor Unwin:—"By a bucket water-wheel we can recover the energy corresponding to an unexpended part of the fall; by a pressure engine we can get the energy due to the pressure, and by a turbine we can get the energy due to the velocity. First then there are bucket or cell wheels, in which the water fills the buckets near the top of the fall and descends in contact with the wheel without acceleration. About this class of motors I have time to say very little. They are simple in principle and have a fairly high efficiency. But they are somewhat cumbrous and antiquated machines. On falls above 70 feet they cannot be used. On falls of 20 to 60 feet a turbine is cheaper, and yields an equal efficiency. [Does the world 'cheaper' apply in Ceylon?] On a low fall, if a turbine costs as much, it has, *if well constructed*, a higher efficiency. Still, in one respect a good overshot or high breast wheel is superior to most modern water motors. *Its efficiency is nearly the same with a reduced supply of water as with the full supply.* In this respect many turbines, otherwise excellent, compare very unfavourably with the water-wheel." Compared with steam, water is 500 times heavier, and its incompressibility and inertia are disadvantages. Of an undershot wheel it is remarked, that apart from the losses by the friction and leakage, it utilized less than half the energy of the fall. The Professor does not believe in more than 80 per cent efficiency in turbines and does not regard the American turbines as better than the British. The description of the various classes of turbines sounds like scientific gibberish:—"There are, therefore, outward flow, inward flow, and axial or parallel flow turbines." But Professor Unwin looks on the hope of turbines with greater normal efficiency than 80 per cent as equivalent to the search for the philosopher's stone.—I have noticed Professor Unwin's paper first because of the impression made on me by his denial of the existence of innate power in water, but the first of the series is a very able paper, by Mr. John Evans on Physiography, in which the laws of our atmosphere are analyzed in the spirit of that wonderful passage in the sacred record:—"All the rivers run into the sea, yet the sea is not full; unto the place whence the rivers come, thither they return again." Beyond this alternative movement of moisture from the sea via the atmosphere to the hills and thence back to the sea science has not progressed. Practically the atmosphere is never free of moisture, but neither diffused moisture nor steam is visible until condensed by cold into small particles of water. "The quantity of moisture present in the air varies considerably in different countries and at different seasons. Here in England it is said that the average proportion of water present in the air is about $1\frac{1}{2}$ per cent. When the air at an ordinary temperature is nearly saturated, a slight reduction of heat suffices to make the moisture visible. How often do we not see a mist rising, as it is called, towards sunset, after a bright warm day; and how often have we not seen the morning's mist, and even the clouds at a higher level, gradually disappear under the genial influence of the sun's rays." Evaporation is often almost equivalent to rainfall. At Madras it has amounted to 90 per cent annually; and the hot winds of the equatorial regions get surcharged with moisture, which they deposit mainly at 4,500 feet altitude on mountain sides in India, and Ceylon, the level of greatest deposit in England being at 1,500 feet. "Mountain ranges indeed are the great condensers of atmospheric moisture, and the amount of rainfall in any country is in the main dependent on the position of these ranges, and the prevailing direction of the winds." Whatever local effects forests may have, in modifying climate and preventing floods, my experience is that it neither increases nor diminishes rain, where warm clouds come laden with moisture and there are mountains, no matter how bare, to condense the moisture. "At Sethwaite in Cumberland, the average rainfall is 140 inches.*" At Hunstanton in Norfolk and elsewhere it is little more than 20 inches; so that on an average there is seven times as much rain in one part of England as there is in another. In India the disparity is still greater, between 500 to 600 inches at Cherapunji and 4 or less in places in Sind. Some of your readers may be interested to learn that 1 foot of undrifted snow is the rough equivalent of one inch of rain. There is much of interest about the capacity of different soils to absorb and retain moisture and about subterranean water and its temperature, rising 1 deg. with every 50 feet or so of depth. "It cannot be too often insisted that, in the case of water supply derived from porous soils, it is in the highest degree illusive to depend on averages. The minimum, or, at the best, the lowest average of three

* At Stye, in Cumberland, in 1883, no less than 190 inches fell

successive years, is the utmost on which we can rely." Mr. Evans also denounced the idea that the supply of water in wells was illimitable; it depends on the amount of rainfall absorbed by the soil in which wells are dug. These are only a few points in an elaborate paper. Still more elaborate is that of Dr. Pole, F.R.S., on "Water Supply," in regard to which his experience was extensive. He reminded his brother civil engineers that they owed their origin and also their name, as contradistinguished from architects, to hydraulics,—in the shape of measures to improve the condition of the rivers of North Italy. He characterized water as the most important natural substance known, and the most indispensible for maintaining the present order of things in organic life. He recollected in his boyhood water sold in cans as milk is now. He referred to the Roman aqueduct, and to the first house supply in London in 1582. The New River supply came in 1613, so that the two systems of pumping and gravitation were in force. Then came filtration in 1829. The effects of filtration and oxidizing were described. Moderately hard water like that of London was good, but for washing and manufacturing purposes soft water was required. The lime in hard water can be precipitated by adding more lime, which, seizing the free carbonic acid, forms a carbonate. For ordinary purposes 10 gallons per head water supply ought to suffice, and 5 to 10 more for extraordinary purposes, such as watering gardens &c., would be ample if there were no waste, but say, to meet all demands, 25 gallons per head per diem. *And provision ought always to be made for increased population.* Ordinary reservoirs and irrigation tanks are fully described. The responsibility of engineers was illustrated by the terribly fatal consequences of the bursting of the Dale Dyke reservoir above Sheffield in 1864, when the water rushing with a noise like "hissing thunder" drowned 250 persons. "Gathering grounds" and their yield of water and *occasional failure in years of drought* were described. All the rain that falls cannot be stored. "Part of the water will be restored to the heavens by evaporation; another portion will be absorbed by the vegetation growing on the land; and another portion will percolate through pores and fissures of the earth." Out of a fall of 44 inches, only 30 will be available Interesting accounts are given of the utilization of Loch Katrine and other lakes as suppliers of water to great cities in Britain. The writer, while dwelling on the oxygenizing power of the air on contaminated rivers, pleads powerfully for the direct application of town sewage to the land: as both sanitary and profitable. In some cases, as at Oxford, the water of a river is taken from its saturated bed and not direct from the stream. These notes give but an imperfect idea of the scope and value of Dr. Pole's most able paper.—— Those on the Inland Navigation of Europe, by Sir Chas. A. Hartley; on Tides and Coast Works, by T. Stevenson, and on Forms of Ships, by Sir E. J. Reid, although all very interesting, I must, in view of the length of this communication, refrain from noticing. The volume is well worthy of being read and studied by others than professional men.

NANUOYA, Nov. 27th

The rainstorm of the 25th seems, for the time, to have emptied the lower atmosphere of suspended moisture, for yesterday remained fine, and today commences crisply cold and beautifully bright, with only the ghost of a breeze. Kabaragala which rises over Nawalapitiya shows its characteristic spots distinctly through the Kotmale Gap; and but for masses of haze in the north-east the whole circumference of the horizon would be clear. Of course the north-east monsoon would say:

> "Ye have not seen the last of my rainstorms, or me,"

but the dry intervals, which are quite appreciable, are very enjoyable.

Our position here, midway between the valleys of the Nanu and Dimbuldanda oyas, on a spur of the Katupillamana range, the head of which faces Hakgala,

> "Like cliffs which have been rent asunder,"

we are as nearly as possible in the centre of a circle formed by the loftiest mountain peaks and ranges of Ceylon. Nearly due north of us is Pidurutalagala, 8,296 feet above sea-level. But for the "trig point" on its summit, the observer would find it difficult to realize that it was higher than its flanking ranges. But there can be no mistake about Kirigalpotta, the second mountain in Ceylon, 7,831 feet altitude, which faces the monarch almost due south. Its white rock face renders Kirigalpotta ever conspicuous; but yesterday, in the clear but not glaring sunlight, after the rain, we saw the sheet rock in a new aspect, reminding us all of one of the minor glaciers we had seen from the summit of the Rigi in Switzerland. The rock was no doubt saturated with moisture, from the heavy rainfall of the previous day, and it positively glittered as it reflected the concentrated rays of the midday sun. Those who have ascended the mountain have stated that the white colour of the rock is due to lichen which covers the surface of the gneiss. But seen with a good glass, which brought out its every precipice and jutting point and ravine, it looked to us like brilliantly white, crystalline quartz scored vertically with strips of dark colour, apparently due to earthy matter carried down by the torrential rains. In any case we are not likely soon to forget the grandeur of this rock glacier, as the sun looked on it so lovingly and with such brilliantly reflected effect, yesterday. Most markedly different in aspect is the mass of of Totapalakanda (7,746 feet) which guards the entrance to the great tableland of Horton Plains, and the sharp point, like a bird's beak, of Kuduhugala (7,607 feet) which stands midway between the two. The pyramidal top of Adam's Peak (7,352 feet) rises, from our point of view, over the keel of the upturned-ship mountain Talankanda (6,137 feet), while our own special mountain, Great Western (7,264 feet), rises close to us, from the Dimbula Valley, over which it presides in massive grandeur. Our circle includes also the Bopatalawa mountains and patanas, Elbedda, Kotagala, Rilagala; and beyond and through gaps, in these we see the more distant ranges of Bogawantalawa, Dikoya, Maskeliya, Dolosbage and the Kelani Valley. In Scotland we are proud of the altitude of Ben Nevis, over 4,400 feet above sea-level. But the bungalow in which I write and look out on no fewer than fifty mountains 5,000 feet to over 8,000 is itself situated 1,400 feet higher up in "the lift" than Scotland's (and Britain's) loftiest mountain.

To descend to Potatoes: Mr. Nock's account of his experiment is most interesting, but he seems to have been exceptionally lucky in not being troubled with black (or brown) grubs. Here they caused us to abandon attempts to grow the prince of edible tubers.—As to getting rid of green bug on coffee, I believe the effectual remedy with all scale insects is an application which will smother mother and offspring; say any coarse flour and any coarse gum or viscid substance mixed with water and laid on so as to cover the insects and stick. But I will write fully the result of large reading on this subject.

SOIL INGREDIENTS.

Iron.—I know of no soil whose contents of ferric oxide would not be more than ample to supply all the needs of vegetation, so far as direct absorption is concerned. Its ascertained percentage rarely falls below 1 per cent. and more commonly ranges from 2 to 5 per cent. A curious fact amply illustrated by analysis is that soils of high ferruginous color do not always contain unusal amounts of the ferric hydrate, the color apparently depending more upon the mode of distribution than on the quantity. This is obvious enough in soil, containing bog ore in visible grains; but in many cases it appears to be a semi-crystalline aggrogation of the substance around particles of soil and sand that hides the tint. The almost universal preference accorded to "red" soils as against gray or whitish lands in the same soil region, has given rise to the proposition to render the latter classes equal to the first by the addition of iron in some form, even to the use of magnetite sand and iron scraps. It need hardly be said that the true cause of the preference given to red lands is chiefly that the presence of this color indicates good drainage, whereas in the corresponding "white" lands the iron as usually accumulated in the subsoil in the form of bog ore in consequence of stagnation of water, forming a subsoil in which the process of reduction may recur at any time, and in which (as analysis has shown and as might have been anticipated) a large proportion of the phosphoric acid of the soil has been accumulated and locked up. A red soil is a "safe" one and is usually freed from the need of artificial under-drainage. That the color imparted by ferric hydrate favors the absorption of heat is another recommendation of red soils; they are "earlier" than those of white or gray tints. Moreover, as direct determinations show, well-diffused ferric hydrate is powerfully hygroscopic, and adds materially to tho retentiveness of soils for moisture; hence crops on such soils are less liable to suffer from extreme heat than those on less, retentive land. My former determinations of this factor in the soils of Mississippi amply illustrate this point, and California as well as Hawaiian soils [some of the latter contain as much as 39·2 per cent of ferric hydrate, corresponding to 27·4 per cent of metallic iron] confirm the conclusion. A point of practical importance is that doubtless in consequence of reductive processes, soils very rich in ferric hydrate suffer more promptly and severely from lack of drainage than similar soils of low iron percentage.

Phosphoric Acid.—The couvicition that has gradually established itself that the practical values of the several calcic phosphates are not nearly as different as was as first assumed, has materially increased the interest of phosphoric acid determination in soils, particularly when these are strongly calcareous, and, therefore, according to the well-known play of affinities, most of the phosphoric acid present will be in the form of a tri-calcic phosphate. There is a good reason why less phosphoric acid in a soil will suffice in soils rich in lime, than in those in which there is no base ready to dispute tho possession as the acid with ferric oxide and alumina which render it relatively insoluble and inert. The very minute amount of phosphates present in the best of soils will render the search of the roots for them very laborious, unless it can be conveyed to them in solution, independently of the acids the roots may exclude. From the discussion of the upland loam soils of the South-western States, I have been led to consider ·05 per cent of P2 O5 as the least amount that can be considered adequate for profitable production in their case, and that tho percentage should rise to ·10 per cent to be satisfactory. But in calcareous, and also in very sandy soils of great depth, less seems a good supply even there, and in California (where nearly all soils are calcareous) the percentage does not very often exceed 10 per cent, even in soils of great present productiveness and durability.

Humus.—Tho determination of humus by Grandeau's method is of the highest interest, as against the extraction with potassic or sodic hydrates, still sometimes recommended. As the latter solvents do not discriminate between the crude, unhumified vegetable matter and the active humus, it misses the main point of interest. What degree of uniformity can be predicted of the composition of humus in virgin soils, I have not had time to determine. Even the physical propertios of tho ammoniacal solution obtained vary greatly yet, as in any case humus must be considered tho repository and store-house of the soils, nitrogen supply, its proportion is of high interest. In the loam (oak) uplands of the cotton States the percentage of humus seems to range usually between ·70 and ·80 per cent in the poorer sandy pine soils, ·40 to ·50 per cent in the black calcareous prairie soils from 1·20 to 2·80 per cent. The determinations made there are not, perhaps, sufficiently numerous to give fair averages. In California and in the arid region generally the humus percentages as might be foreseen average somewhat lower; lowest in light loam soils of the high *mesas* of Southern California, where ·30 per cent and even less has been found; yet these soils produce well at first, when irrigated. Percentages of ·45 to ·60 of humus are common in good upland loam soils that are neither very calcareous nor highly ferruginous. The "prairie," or black adobe soils usually range from 1·20 to 1·80 per cent, a very few as high as 3·00. On the whole, the highly ferruginous soils are remarkable for large amounts of humus; as in the red soils of foot hills and of the Coast Range. In these latter cases, however, the ammoniacal solution is usually quite light-colored, and only becomes dark on evaporation, doubtless by oxidation. It is pointedly claimed in some of the fruit-growing regions of this State that a too clean cultivation, entirely suppressing the growth of weeds, and thus affording no annual addition of vegetable matter save from the fall of the leaves, tends to injure the production of the orchards. It is readily conceivable that the long, dry and hot season would tend to cause a very rapid oxidation of the humus in the soil well tilled amounting to deprivation when only a very little is originally present. From experience had in green-manuring, it seems that half of 1 per cent (·50) is the minimum of humus desirable in California, and that when less is originally present an increase should be brought about as soon possible. In Western Oregon and on Puget Sound, where tho summer rainfall is very heavy, humus percentages ranging from 3 to 6 per cent are quite common.—*Farmer's Review.*

CEYLON COCOA.

By Dr. A. J. H. Crespi.

One of the most curious features of modern commercial activity is that Nature is, as it were, compelled to improve on her own earlier efforts. Supposing that some much-prized plant is found to do well in a particular region with a climate of given warmth and under certain recognised conditions: the next thing is to find out a region where these conditions are still better, and to introduce tho plant there. This seems to have been done with the cacao tree in Ceylon, and cocoa of superlative excellence has for many years been manufactured from cacao beans imported from that beautiful island. Some brands of Ceylon cocoa have been recently commanding very high prices; this shows what a magnificent field exists in Ceylon for cocoa culture, and that the quality of the cocoa from that island is far above the average of West Indian varieties. The principal peculiarity of the Ceylon brand is its delicate flavour and rich aroma; although when prepared for use its price is not very high, and quite within reach of most incomes. We confidently predict that as it becomes more generally known it will be sold in still larger quantities, and so open up a fresh and most important branch of trade to British enterprise.

Messrs. J. S. Fry and sons, the well-known makers, whose house was founded in 1728, were not slow to recognise the peculiarly delicious flavour of Ceylon cocoa, and they have accordingly added another luxury to our household beverages in the form of Ceylon chocolate, a speciality that is being much appreciated by connoisseurs.

While on the subject of Ceylon cocoa, we have just been favoured with some of the most recent statistics relating to the consumption of cocoa in England. Although a great authority gives the average consumption as five ounces, per head, it is now ascertained to amount to eight, or, to be more precise, in 1889 it reached 18,464,164 pounds. This is not a large total after all, but marks progress. In 1820, duty was only paid on 267,000 pounds; in 1875, on 9,900,000 pounds. In other words, the consumption has doubled in fourteen years, and should the present rate of progress continue another fourteen or fifteen years, the trade will reach, for the first time, very respectable dimensions.

Considering its fragrance and nutritive properties (for all preparations of cocoa are a true food, and valuable as tissue restorers and force producers), perhaps the small consumption is surprising. For our part, we prefer well-prepared cocoa to all other beverages, while indigestion, which is so frequently caused, or, at any rate, aggravated by the too liberal use of hot tea, does not follow cocoa. The cocoa trade is in a healthy and active state, and the wants of the general public are not likely to be neglected as long as so many leading English firms are busily engaged ministering to the national needs.

One of the best uses to which Ceylon chocolate can be put is to eat it when on tricycling or pedestrian excursions. We have it most convenient, and we believe that cyclists, who are often at a great loss for a portable and palatable food which they can eat without dismounting, will more and more trust to chocolate as their sheet-anchor. Long before our attention had been directed to the subject by a circular we were reading the other day, we had found out the value of dry and satisfying food when many miles from home and pressed for time.—*Hardwicke's Science-Gossip.*

THE SORT OF TEA WE DRINK.—£1 10s 6d, 6s 3d, 3s 8d, and 2s 8¾d—these were the prices per pound, as sold in Mincing-lane, without duty, &c., of the teas that a "Star" man was drinking yesterday. It was in the London establishment of Messrs. Forster, Green, and Co. the big Dublin teamen, that this extravagant spree on tea took place. The primary object of our man's visit was to sample the £1 10s 6d tea, which was sold for £2 to a Leicester tea dealer, who is now retailing it at £3 3s. Some of it was sold in 1oz. packets at 5s per oz. There were only 15lb of this tea in the world, and there may never be such tea again. Previous to this no tea was ever sold in modern times in Mincing-lane at more than 10s or 12s a pound. This £1 10s 6d tea, therefore, has fairly eclipsed everything. It came from the Heathersett estate, Ceylon; and though this and other estates might supply us with such tea regularly, they are not likely to do so, as the cost is too great. In the first place it destroys the tea plants, the leaves being gathered just when they are beginning to sprout, and in the next place every one of these very tiny leaves is gathered by hand. As for the appearance of the tea, it is like very fine cut tobacco of a light colour. To an ordinary observer it doesn't look like tea at all. And as for the taste—well, to the amateur, it is disappointing at first, but after you taste another—say 6s 3d per pound—tea and then go back you begin to think there is something in it, after all. A good many points about the liquor and the leaves and the clouds the milk formed when added were explained by Mr. Holloway, Forster Green's London man, to our representative, who, however, was unable to follow him into the subtle distinctions he drew. One point of public interest he gathered, viz., that in London teatasters infuse the tea exactly six minutes; in Dublin, owing to the difference in the water, the time is eight minutes.—*Home Paper.*

MARIAWATTE AGAIN.—We learn that the yield of the now famous 100 acres of Mariawatta estate, which has given year after year 1,000 lb. or more of made tea per acre, has been, up to the end of last month, 1,100 lb per acre for the current year. This highly satisfactory record presents a hopeful outlook for tea on suitable land, while it is also proof of what high cultivation can do. True, Mariawatte's are not to be got for the asking; but the evidence of the fruits of liberal cultivation should not be lost on proprietors, the majority of whom seem content to believe in the hardiness of the tea plant and to get what they could from it, without giving it back some of the profits, in the hope of a still larger income. We congratulate the proprietors and the superintendent on the continued prosperity of Mariawatte —*Cor.*, local "Examiner."

DISAPPEARING CINCHONAS.—At the sitting of November 5th of the Paris Society, of Pharmacy M. Landrin, the great dealer in barks, and a good authority on cinchonas, presented a number of specimens from South America. One was a cultivated Bolivia Calisaya in very large pieces containing 3 per cent of quinine. It seems in some countries like Greece and other parts of Southern Europe they will pay 10f. a kilo. for bark in long slices, and offer only 4f. for smaller ones, which are just as rich in alkaloids. M. Landrin also had Guayaquil uncultivated red bark, containing 95 per cent of alkaloids; quills from South America veined like a serpent's skin; and other rare specimens. He added that cinchonas are now becoming scarce in their native country; some sorts will no doubt soon disappear altogether. So, while they are still to be had, it is well to present specimens to the college collections for the benefit of pharmacy students, for which kind attention M. Planchon thanked the donor in the name of the college.—*Chemist and Druggist*, Nov. 8th.

PREPARING FOR THE WINTER MOTH.—Mr. J. Masters writes to the *Evesham Standard* as follows:—"As the season of the year is approaching when the winter moth will be making its appearance, a few hints, by way of reminder to fruit growers, may not be out of place:—

"1. The wingless female moth will be soon making its ascent of the tree, to deposit its eggs for the future brood of caterpillars.

"2. The best proved method of intercepting the moth is to band the trees with cart grease. Buy none unless guaranteed as free from tar. Numbers of young trees have been killed by injurious compounds sold as grease.

"3. Do not use oil in the grease to make it thin. If the daub is stiff, it will last the longer. It is important to have it sticky, and look after it and keep it so, otherwise the moth will creep over it.

"4. If trees are young and the bark is smooth and tender, some grease-proof paper should be tied next to the bark of the tree, and the daub placed on the paper. If trees are matured and the bark is rough, good grease will not injure the tree.

"5. Trees where grease-proof paper is used will not require so much grease, as the paper prevents the bark from absorbing it. If all the trees were banded with paper, it is probable that the saving of the cost of grease would be an equivalent for the cost of paper banding.

"6. Grease may be applied with the hand, or a thin flat piece of wood, or a small brush; in either case put on a thick layer of the grease.

"7. Grease banding should not be delayed after the second week in October, and will require attention until the end of November.

"8. The appearance of the moth may be known by taking out a light in the dusk of the evening when the male moth, if any are present, may be seen. If no male moths are seen, you need not trouble to grease-band the trees.

"9. Do not be discouraged if, after all your pains, some caterpillars are found; when numerous they are not to be exterminated in one season."—*Gardeners' Chronicle.*

CEYLON UPCOUNTRY PLANTING REPORT.

Nutmeg—Weather and Coolies.

Nov. 18th.

The present concern in the culture of *Nutmegs* gives an interest in their past history. It is like a stale joke referring to the order which came out from home, when mace was at a very high figure, that more mace was to be grown and less nutmeg. But is it history? Was such an order ever given, and is it not more likely that it was made in the East and fathered on the west? To be sure it is like the mistake of a smart man at home,—these fellows who know everything, and are prepared to advise the world: but this of course would only give it all the morepoint.

That the nutmeg does flourish in history, is undoubted, for I lighted on a reference to it while reading Leckey's "History of England," the other day. It is instanced in illustration of the extreme multiplicity and complexity of duties which obtained in England before Pitt took the matter in hand and brought order out of confusion. "It was noticed," says Leckey, "by one of Pitt's best officials that so trifling an article as a pound of nutmegs paid, or ought to have paid, nine different duties." Growers of nutmegs may rejoice that in these days all this is changed.

Our present weather is just perfection for tea flush, and most estates are strained to keep up with it: everything else too is ripening, and these months are certainly the big harvest of the year, and when a place cultivates more than one product, it is kept busy.

Coolies on the whole are about enough for the ordinary wants—a little pressure does no one any harm, keeping us from going to sleep, and waking into life faculties which otherwise might be rusting.

The rain however is still very short of want it should be, to be made up, no doubt, later on.

Peppercorn.

THEFT OF CACAO (AND POSSESSION OF SAME BY A PRIEST) FROM THE WARIAPOLA ESTATE.

In the Police Court of Matale.

No. 5,611, October 27th.

Robert S. Fraser of the Wariapola estate *vs* Piyadessa Unnanse of Tibbotumulla.

A Cacao Planter's Experience.

A. G. K. Borron sworn, stated: That he has been a planter for twenty-eight years, eight of which he had a good deal of experience in cacao. He stated that the accused begged that Court to proceed to the pansala garden, when the Magistrate promised to visit the spot the next morning, which he did on the 31st ult. with Mr. Faulkner of the Suduganga estate. This gentleman also spoke of the difference of the seeds of the different varieties and of the trees on the Wariapola estate and the pansala garden.—The following is the

Judgment.

There can be no manner of doubt that the cacao seeds found in the possession of the accused were seeds of the Forestero variety of cacao. That has been established upon evidence that is unexceptionable and satisfactory. Mr. Fraser's evidence and that of Mr. Borron place this question beyond all doubt, and it is further proved that the seeds found in the possession of the accused were all immature and unripe. That these were taken from pods stolen from Wariapola estate there can be no doubt, upon the evidence in this case and upon what I myself saw on visiting that portion of the estate which adjoins the accused's pansala garden. Not that this item of proof is necessary under the provisions of section 2 of the Ordinance No. 22 of 1886, which constitute the bare possession of unripe fruit of the cacao an offence, but it is always most satisfactory to find that the marks of recent stripping on the trees from which fruit have been stolen make it all the more clear, that the unaccounted for possession of the seeds is an indication that the seeds have come from pods stolen from the stripped trees. The prompt action taken by Mr. Fraser and his men led to the discovery of unripe seeds in the possession of the accused, for which possession the account given by the accused is utterly untrue. He stated explicitly that these pods had been gathered from his own trees that very morning.—Mr. Fraser very properly asked him to show the trees from which they had been gathered, and he showed to Mr. Fraser what he showed me when I visited the garden at his request,—trees of the criollo variety which under no circumstances could have yielded seeds of the Forestero variety. I have had the advantage of seeing the pansala garden, and it is only too obvious that the seeds found in the accused's possession could not have been the produce of those trees. I carefully examined the trees in that gardenand except three or four plants which had borne no fruit, and two of which were only just beginning to bear, there were no other Forestero trees from which fruit could possibly have been gathered that morning. The clumsy attempt of the little stripling priest to show me a fruit alleged by him to have been taken from a tree which five minutes before I had examined in his absence, and on which I found no such fruit or anything worthy the name of fruit, was soon traced to what was obviously a theft committed by him from one of Mr. Fraser's trees, while we were walking about the pansala garden,—on the other side of which were Mr. Fraser's trees separated from our view by a lantana hedge and other trees. This only indicates the facility with which thefts are committed of fruit belonging to Mr. Fraser's estate.

It has been urged for the defence that others may have committed the theft. It is not necessary to entertain the thought of such a contingency, because the priest has not put that forward, but has stated that the seeds found in his possession were the produce of fruit picked by him from his own trees. That he stated to Mr. Fraser and the same statement he made to me. It was further urged that he was a blind old decrepit man. That he was old and somewhat feeble, I could see easily, but he certainly was not blind, nor anything like decrepit. I daresay he has put on the semblance of decrepitude to avoid the consequence of his guilt. No doubt his age entitles him to some consideration, and in meting out the punishment due to his case, I have taken that into consideration. Had he been a younger man I should have given him rigorous imprisonment as a substantive punishment.

The enormous ravages there are being committed by natives in the neigbourhood of coffee and cacao estates indicate well organized and systematic robbery of produce. Not only are the fruits stolen from the trees, but the bearing capabilities of the trees are sensibly diminshed by the ruthless stripping of the fruits and the tearing away of the fruiting eyes of the trees.

I find the accused guilty and sentence him to pay a fine of fifty rupees and in default of payment to be kept at rigorous imprisonment for a term of three months.

(Signed) J. H. Eaton, P.M.

Timber Trees.—Mr. A. Mendis Senanayake, Arachchi (he ought long ago to have been made Muhandiram) of Moratuwa, has been carrying on the list of the Principal Timber Trees in Ceylon, first drawn up by his father, Mudaliyar Mendis. The copy that has been sent us is very nicely printed with 156 separate trees with Sinhalese and botanical names (in some cases Tamil also) and a variety of information such as uses, average size of log, &c. Planters in need of such a list can, in a few days, secure copies on application to the *Observer* bookstore. It behoves Government Agent Dawson to look out worthy industrious Sinhalese men such as Mr. A. Mendis Senanayake—the respected son of a worthy father—for higher honours.

REVISED ESTIMATE OF INDIAN TEA CROP—CURRENT SEASON.

The Indian Tea Association has favored us (Messrs. Wm. Moran & Co.) with the following, giving the revised estimate for the current season:—

"In their circular of the 28th April last the General Committee gave an estimate of the out-turn of the present season's crop of Indian Tea based upon the following figures which they had been able to collect:—

Original Estimate of Crop of 1890.

	lb.
Assam	48,295,344
Cachar and Sylhet	33,385,680
Darjeeling, Terai and Dooars ..	22,817,270
Chittagong and Chota-Nagpore ..	1,514,800
Dehra Dun, Kumaon and Kangra ..	4,500,000
Private and Native gardens	4,500,000
	115,013,094

"From the figures which have since been obtained a revised estimate has been prepard, based upon actual results to the 30th Sept., as follows:—

	Manufactured to 30th Sept. 1889. lbs.	Manufactured to 30th Sept. 1890. lbs.
Assam	31,680,136	32,923,787
Cachar and Sylhet ..	20,736,051	23,815,670
Darjeeling, Terai and Dooars	1 62,384,91	15,291,811
Chittagong and Chota-Nagpore	1,049,419	1,221,080
	69,700,497	73,252,348

Revised Estimate of Crop of 1890.

Assam	45,001,072
Cachar and Sylhet	34,477,770
Darjeeling, Terai and Dooars ..	21,070,453
Chittagong and Chota-Nagpore ..	1,768,716
Dehra Dun, Kumaon and Kangra ..	4,500,000
Private and Native gardens.. ..	4,000,000
	110,818,011

"The exports to Australia, America and other places for the past season amounted to 5,388,560 lb., and if this quantity, plus 10 per cent, together with the requirements of Northern India now calculated at 500,000 lb. be deducted from the revised estimate, there will remain about 104½ million lb. for shipment to Great Britain during the season of 1890-91 against 98 million lb. shipped there in 1889-90."

CINNAMON AND COCONUTS: PLANTING REPORT.

KADIRANA, 24th Nov.—From the 26th October to the 15th inst., 19·87 inches of rain have fallen in this district, so that wells and springs are replenished, and all outward appearances of the late drought have disappeared, though its consequences will be felt for more than a year to come. This rain, and the fine weather we have had for over a week past, have matured the "bud" there was on the bushes, and no doubt those who intend cutting for the "punchi mosama" will soon begin work. All Mr. Tudor Rajapakse's cinnamon estates in this district are to be leased, and as in the conditions there is no clause binding the lessee to carry out the arrangement not to scrape chips, a large quantity of these will be thrown upon the market which, in conjunction with the distrust and suspicion of bad faith already abroad, will probably lead to the cancelling of the agreement upon honour, which has still a year to run.

"LYSOL" is a new disinfectant which is prepared by emulsifying carbolic acid with ordinary fat or resin soap, and the tar acid is incorporated with the soap at the moment of saponification. It is said to be more active than carbolic acid by itself.—*Globe.*

POTATO CULTIVATION IN THE HILL COUNTRY OF CEYLON.

Mr. Nock of Hakgala Gardens is good enough to give us the following account of his recent experience—just to show that potatoes can be profitably grown on the hills of Ceylon, if good sorts and good seed tubers are used:—

"On 22nd of Aug. last I planted, in good friable soil, 48 tubers of each of the three kinds named below, and I lifted them yesterday with the following results:—

"CHESWICK FAVOURITE.—From 48 sets the produce was 482 tubers weighing 85 pounds. The twelve largest weighed 7 pounds and the largest single tuber 11½ ounces.

"IMPERATOR.—From 48 sets, 357 tubers were produced weighing 75 pounds. The twelve largest weighed 8 pounds and the largest single tuber 12 ounces.

"ADIRONDACK.—48 sets produced 457 tubers weighing 65 pounds. The 12 largest tubers weighed 6 pounds and the largest tuber 11 ounces.

"Every tuber of Cheswick Favourite and Imperator were quite sound. There were about 12 or 15 tubers of Adirondack that were diseased, but these were from a few roots at the bottom of the row where the soil was a little damper.

"A more even lot of tubers I never lifted and I attribute this evenness chiefly to the way the sets were prepared for planting, but in some measure it may be due to the very favourable weather during the time of growth.

"Every set was a whole tuber, and the average weight used was about 2 ounces; these tubers had been previously laid out in a room, exposed to the light, and occasionally turned—which had caused the eyes to send out very sturdy sprouts and when these were about one inch long they were planted in rows 2 feet apart, the sets being 1 foot apart in the rows. The manure used was a little bone dust, and wood ashes with a sprinkling of lime. The only other attention they received was to keep them free from weeds and to earth them up well.

"They were in the ground only 84 days and during that time 12·70 inches of rain was registered. This fell on 47 days, but on only 10 days did ·50 or more fall, On 27 days the fall was ·15 or less, so that this sort of weather just suited them.

"This is the fourth crop from a few tubers I brought on with me from Worcestershire, exactly two years ago, and I think this proves that with careful selection and preparation of "seed" tubers, that the potato improves in this locality, instead of deteriorating as I believe is generally supposed.

"Our rainfall for this month to date is only ·50."

THE CEYLON AMERICAN TEA COMPANY.

The following is an extract from a letter from Mr. Stretch of Messrs. Darley, Butler & Co., dated London, 13th Nov.:—

In writing last week about the new Ceylon Planters' Tea Co. I had hardly got hold of my facts. Since then I have copy of the prospectus and full details of the proposed arrangements. The point which shareholders, or intending shareholders will require to be informed upon is how a dividend is to be paid on $1,000.000 with a working capital of only only $200,000. The shares are divided as follows:

Working capital	10,000	shares at	$20	$200,000
To old Co.	12,000	do	do	240,000
To Promoters	28,000	do	do	560,000
	50,000	shares at	$20	$1,000,000

I suppose when the Company is in full working order the working capital may be turned over 3 times a year so that the turnover would be $600,000. It will require 10 per cent profit on that to pay 6 per cent on the total capital. What are the prospects of earning such a profit? I hear that the tea sold in the States is rarely sold under $1 per lb

which of course would give a much larger profit, but in order to sell the quantity required they must reduce the price, I imagine. If it is possible to get agents in all the towns that it is desired to be represented in, a very small quantity sold annually by each agent will do it.

November 24th.—The more I look at the scheme of this Company the less objectionable it seems. I got so far as that it required to earn 10 per cent on its turnover to pay 6 per cent on its total capital when I last wrote to you I think. I have now got a step further, viz: that inasmuch as a man gets 2 shares for *one*, 6 per cent will be equal to 12 per cent to him and therefore 5 per cent on the turnover will yield equal to 6 per cent making a very feasible and workable thing of it. I have no doubt the thing is in the hands of respectable people and will with push and energy prove success." We hear from Messrs. Wattson & Farr this morning that they are successful in getting some good Agents and think the co-operative scheme will work very well.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)
London, Nov. 6th.

CINCHONA.—At the periodical auctions held on Tuesday a moderate quantity of bark was offered, the catalogues comprising:—

	Packages		Packages	
Ceylon bark	1,675	of which	1,432	were sold
East Indian bark	.. 322	do	268	do
Java bark	 42	do	42	do
S. American bark	 354	do	196	do
Total	2,393	do	1,938	do

It will, therefore, be seen that of the Eastern barks offered over 85 per cent were disposed of, while the proportion of bark sold to the total offered was about 1 per cent. The auctions opened with fairly steady competition, but gradually the demand slackened, and holders occasionally accepted a slight decline on the previous rates for manufacturing barks. The tone of the market was barely steady, and the unit cannot be quoted higher than from 1⅛d to 1⅜d per lb. Druggists' barks, however, particularly red shavings, were very well competed for and brought full prices. The assortment of bark was a poor one, especially that of Ceylon bark, ordinary Succirubra chips and root making up the bulk of the supply. But there were several parcels of good strong Crown bark imported from Bombay.

The prices were evidently considered low enough by some speculators to tempt them to secure a small quantity, and about 9 tons were thus bought through a firm of brokers. It should be well understood that the mere weight of bark purchased affords no guide whatever to the quinine yield represented by it, firms who by a small quantity of bark by weight frequently taking the richest lots and *vice versa*.

QUININE.—The point reached this week is the lowest which has been known for some months. At the close of last week about 20,000 oz of German bulk in the second-hand sold at 1s per oz., and the week opened with further sellers at that figure. Another parcel of 20,000 oz subsequently sold at 11⅞d per oz while for 10,000 February and April delivery 12½d was accepted; since then, however, the market has somewhat improved, and t closes today with buyers at 1s per oz., but no sellers at that figure. The result of the Amsterdam bark sales may, however, affect the position of the article again. We hear of a sale of 5,000 oz second-hand German today at 12½d per oz for February.

THE ARTIFICIAL PRODUCTION OF SUGARS.

Barely have sixty-two years elapsed since the great German chemist Wöhler prepared urea artificially. Up to that date the opinion was generally held that all chemical compounds which are found in the bodies of animals or plants could not be made artificially. They, it was said, are the results of vital action, and the endeavour to prepare them in the laboratory was considered as impossible, and almost as wicked as to try to manufacture an homunculus. Wöhler's discovery at once dissipated that false notion and since his time the labours of chemists have resulted in the manufacture of hundreds of compounds formerly only obtainable by natural processes carried on in living organisms. The latest and perhaps the most remarkable of these triumphs of synthetic chemistry has just been made known to us. The group of bodies termed by chemists the carbo-hydrates—because they are composed of carbon united with oxygen and hydrogen in the proportion in which those two elements combine to form water—contain the well-known series of sugars, gums, and starches. The chemical composition of these bodies has long been known, but a knowledge of their constitution—that is, the mode in which their several constituent parts are put together—has only recently been acquired. It is clear that until we know what is the structure of a complicated arrangement of atoms, it is useless to attempt to build up that arrangement. We must have a plan of the house before we can build it. Such a plan of the structure of the sugars is now in our possession, and their artificial production has therefore become a possibility, and in the hands of a distinguished German chemist, Professor Emil Fischer, of Würzburg, that possibility has just been converted into a reality. The various steps by which this great result has been accomplished can only be explained and appreciated by those familiar with the intricacies of modern organic chemistry. But the importance of the discovery is patent to all. The group of carbo-hydrates (sugar and starch) are, next to the albuminoids (eggs and flesh), the most important material needed to support animal life. Indeed, the vegetarians would, and perhaps rightly, place them first. Can we look forward to a time when the chemist will manufacture our sugar, when the sugar-cane and the beet-root will cease to be planted, because their products can be more cheaply manufactured from coal or wood? Results apparently as improbable have happened. Who could have foreseen that the thousands of acres upon which the madder-plant grew in France and Turkey would now yield corn and hay, because it was found that the dye formerly obtained from that plant can be more cheaply made from coal-tar? So, too, indigo has been artificially obtained, and who can tell that a recent new process for its manufacture may not prove fatal to the indigo planter? That the process of making sugar artificially is now too expensive to compete with Nature is, therefore, no proof that cheaper processes will not be discovered; indeed, that this will happen may be taken for granted. So that, looking back to the enormous strides which chemistry has made during the last half-century, and seeing what has already been accomplished, he would be a bold man who should dare to define the limits of her power, or to declare that our grandchildren may not use artificial sugar to sweeten their tea, and that Jamaica may know the sugar-cane no more. From a biological point of view, too, this discovery is of deep interest and importance. We know nothing, or as good as nothing, of the processes by which sugar is produced in the plant, nor how this sugar is transformed into starch, fat, and woody fibre. Are these results due to a special vital force, or does this expression merely serve as a cloak for our ignorance, and will careful investigation show that these substances are built up in the plant by methods similar to those which are now successfully employed in our laboratories? That this latter is the true view is the belief of the chemist, and nearer towards that end the discovery of Fischer has undoubtedly brought us.

An interested physiological question now presents itself. Supposing that these artificial sugars were to become articles of common diet, what will be their effect on the animal economy? That two chemical compounds may possess the same composition, and even the same chemical arrangement of their parts, and yet act differently from a physiological point of view, is well-known. And still more likely will this be if the artificial sugar differs in composition from the natural one. The blood and tissue which are formed from the artificial carbo-hydrates may differ from those which are the results of the assimilation of the natural sugars. If the pig and the goose were fattened on an artificial diet, their fat might differ from that which

they now form; and the bee fed on manufactured sugar might yield another kind of wax.

But we may go one step further. We know that plants not only convert sugar into fat, starch, and woody fibre, but that in presence of certain minute organisms they form nitrogenous or albuminoid compounds such as the gluten of wheat. Supposing it were possible to feed plants or these minute organisms on artificial sugar, differing in their properties from their ordinary food, it might force the plant to manufacture a new kind of albumen. And then what new structures might not be expected to start up from the use of the new building material?

Chemistry would then, for the first time, bring her potent influence to bear upon the structure of organised beings, and the changes of form which would result might prove to be of the strangest and most unexpected kind—changes far more remarkable than all those, singular and far-reaching though they be, caused by processes of artificial selection or of cross-breeding. The revelations of science have already outstripped the marvellous. What yet remains concealed in her bosom defies the wit of man to foretell. H. E. ROSCOE.

—*The Speaker.*

SEWAGE AND SUGAR.

Under this heading the *Pall Mall* has a paragraph which ought to promote a "fierce boom" as the writer says in Ceylon tea:—

Dr. Richardson told a horrid story on Saturday night in his lecture on the progress of sanitary science. Years ago, he said, the sewage of London, or part of it, used to be taken to Jamaica in barrels to manure the sugar gardens. The exporters of sewage thought it would be a pity to waste their barrels, or to bring them back empty; so the self same barrels were filled with a return cargo of raw sugar. The story needs no comment, but it suggests two queries; first, whether we get rid of our sewage in a very much better way now, by turning it wholesale into the river; and, secondly, whether there may not be today many products of origin as tainted as was that of Jamaica sugar. Travellers for the interior of China tell very nasty tales about the personal habits of the coolies who tread the tea intended for the use of the "foreign devils." Doubtless boiling water removes a multitude of evils, but it does not kill imagination; and if the confiding British citizen could see the feet beneath which his Chinese half-pound had passed, there would be a fierce booms in "Indias" and "Ceylons."

A NEW CEYLON PROJECT.

Under the title of the Ceylon and Oriental Investment Corporation, Limited, a company has been registered, with a capital of £250,000, in 49,950 ordinary shares of £5 and 250 founders' shares of £1 each. Its object is to acquire, by purchase or otherwise, and to lend or invest money at interest upon the security of lands of freehold, leasehold, or other tenure, stock, crops, plantations, tea gardens, buildings, mills, machinery and plants, mines, mining claims and rights, and mineral lands generally; documents of title, warrants merchandise, and other property in Ceylon India or elsewhere; to carry on business as planters of tea, coffee, rice, cinchona, tobacco, or other produce. The subscribers who take one share each are:—G. G. Arbuthnot, 144, Winchester House, E C.; H. C. Smith, Hay's Wharf, S.E.; C. E. Johnston, 59, Cadogan Square, S. W.; J. H. Thring, Alford Castle, Carey, Somerset; H. A. Hancock, 28 Mincing Lane; A. Zimmern, 51, Lime Street, E.C.; S. H. Goodhart, 22 and 23, Great Tower Street, E.C. There shall not be less than three nor more than eight directors. The first are George G. Arbuthnot, Hamilton A. Hancock, Cyril E. Johnston, Charles A. Reiss, and J. Huntley Thring. Qualification, £500. Remuneration, £1,000, divisible.—*H. and C. Mail.*

CEYLON AND ITS PRODUCTS.

TROPICAL AGRICULTURE.

I have more than once, before now, favourably noticed the very admirably compiled "Handbook of Ceylon," periodically issued from the Colombo Press, by Messrs. A. M. and J. Ferguson; and the volume now before me for 1890 91 is in wealth of matter, arrangement, and general get-up, superior to any of its predecessors.

There are few colonies so fortunate in their chronicler. Certainly no tropical colony in the world is so well furnished with a complete directory, probably because no other colony has been furnished with such a Ferguson. For full 30 years the work has made its appearance at stated periods. At first (in 1859) a tiny booklet of 100 leaves modestly apologising for its "thickness"! Now, without a blush, its red and gold covers firmly clasp over 1,400 pages of closely-printed matter. And such matter! The carefully accumulated cream of 30 years' brain-work. The agricultural, financial, and statistical experience of a lifetime; all pertaining to the most successful of our Crown colonies, and contributing by its accurate information, not a little to the continued prosperity of this our leading Crown colony. Every public library, and every individual in any way connected with the Spicy isle, ought to possess a copy of this comprehensive work.

But of even more interest to the general reader will be the complete volume for 1889-90 of the "Tropical Agriculturist," a copy of which has also reached me from the same press. This is, as far as I am aware, an entirely unique work. For while in Europe our press teems with "Farmer's Journals" and works on the agriculture and horticulture of our temperate regions, this is the only periodical devoted exclusively to Tropical products; a field at once so absorbing, interesting, and extensive, that the marvel is that its special advocate and chronicle has been so long in coming. Perhaps no man so admirably fitted for the work of editing such a periodical had before taken root in the Tropics. His keen observation, restless energy, and facility for extracting the essence of all that is known of every conceivable tropical product, gave John Ferguson a peculiar fitness for the post—a fitness which he labours so assiduously to improve.

Here will be found from time to time all that is interesting to planters, and all that pertains to the rich and varied products of tropical and semi-tropical lands, their cultivation and preparation for the market, where and how to sell or buy, and how best to use at home. From New Guinea to Peru every important scrap of information is gathered and husbanded, while the East and West Indies, Africa and Brazil, are ransacked for new, or suitable soil, in which to grow the old luxuries or necessaries of modern life. Not many years ago the preparation of so common an article as tea was enveloped in mystery—now China itself has been turned inside out. A dozen years ago the cultivation of such precious plants as coco, cacao, cinchona, cubebs, cardamoms, &c., was little known; the varied preparations from the palm tree were little heard of, and the magnificent flora of these warm humid regions sealed up from the general reader. Now all is here treated in a manner at once attractive to the million, useful to the man of business, and deeply interesting to the scientist. Ceylon, indeed, is now coming to be recognised as the experimental garden, or model from *par excellence* for the tropics; and its lot may be to bring about many marvellous changes as to the source of our supplies. Twelve years ago, for instance, not an ounce of chocolate had ever been shipped from the East. True, our good old friend, Mr. R. B. Tytler, had for years his pet little chocolate field, which he liked to show to his special friends, and joke over the possible fortune of the future. And many a fair castle have I heard him build as the fragrant smoke rose like incense from his lips! But it was not till the collapse of coffee that he thought seriously of extending the cultivation of cacao and acquiring the necessary knowledge of its preparation. R. B. T. did nothing by halves. "I'm off to Trinidad to see how it's done,"

he wrote to me on 30th November, 1879, and three months later I find him writing—"Back again, full of acquired valuable information; damages, £200; well worth it. My next move will be to the East, to show them how to do it. It is important to give the new product a correct start on entering the market, and getting a good name from the first. *Lanka will owe me not a little, I assure you.*" Two years more, and my friend writes his last from Ceylon. "O for a crack with you! The coffee is played out, but the chocolate is magnificent, 800 acres planted on Palli, first planted bearing 8 cwts. per acre—115s 6d in London! (Trinidad only realising at same sale 90s.) Clear profit, 100s per cwt."

Mr. Tytler's estates continued to prosper, and are now among the best cocoa estates in the world; realising probaly from £7,000 to £8,000 clear profit a year; but the full tide of prosperity came, alas! too late for my good old familiar friend. "Oh for the dream-days back again" he was wont to exclaim—"*They* were glorious *realities*—now it is the dregs, the apples of Sodom. Foggy neeps!

The annual export of cocoa from Ceylon has now reached 2,000,000 lb., paying the producer handsomely; but a new generation of planters has arisen who know not their benefactor. Meanwhile, it is curious to note that our friends in the West Indies are about to send a commissioner all the way to Ceylon to see "how the thing is done." Still more curious and startling is the case of tea, the export of which has now risen to over 40,000,000 lb., and in a few years more is estimated to reach 70,000,000; while it is positively painful to read the lamentations of Chinamen over their decaying industry. Albeit, John has, as usual, had but scant justice in this tea business, handicapped as he is with a heavy export duty—a duty, by the way, for years collected by British officials to pay for our uninvited visit to Pekin. In other words, the Chinese have paid their so-called indemnities in tea. Is it any wonder, under the circumstances, that the China leaf does not improve in quality or cleanliness.

COLONIENSIS.

—*Aberdeen Free Press*, Oct. 11th.

OUR TEA CROPS AND ESTIMATES.

It is well to put on record once more in an unmistakable way, how the figures stand in reference to our Tea Crops, or rather Shipments, and Estimates.—For the old Commercial Year 1889-90 (1st Oct. 1889 to 30th Sept. 1890) Messrs. Rutherford and Scovell estimated total shipments

equal to	43,000,000 lb.
The *Ceylon Observer* estimated ...	42,000,000 „
Actual result	42,994,000 „

For the current Commercial Year (1890-91 estimates are as follows:—

Ceylon Observer's ...	51,000,000 lb.
Mr. A. E. Scovell's ...	52,000,000 lb.

For the Calendar Year 1891,—

Mr. H. K. Rutherford estimates:—52,750,000 lb.

This will, we believe, prove if anything below the mark, and our own inclination will be to estimate for 1891's shipments, at a million more,—

Ceylon Observer for 1891,—53,750,000

But we shall be better able to judge at the end of the present year. If, as we expect, the total shipments for 1890 will not be less than 45,000,000 or an increase of close on 11 million lb. on 1889, we should expect a rise of not less than 9 millions lb. in 1891.

But of more interest to our home readers is it to mention that the total shipments of Ceylon Tea to the United Kingdom in 1890 are likely to be about 42½ million lb. against 104½ million lb. from India in season 1890-91. In 1891, Ceylon will probably send close on 50 million lb. to the United Kingdom, unless a big trade direct between Colombo and New York, Colombo and Odessa set in, as well as a steady increase in the export to Australasia. In that case we may have less than 50 million lb. to send to London.

NOTES FROM CALIFORNIA.

Our readers will find much that is interesting in the following letter from a former Ceylon planter who has now settled down to cultivate "bean land" in far-off California:—

Rancho Santa Katrina, Saticoy,
Ventura County, California, Sept. 9th.

It is a long cry from here to Ceylon, but I have no doubt the Postal Union is capable of carrying my good wishes for yourself and family and for the "Old Rag," for a perusal of which my soul panteth sometimes, to read of old friends and old familiar doings.

You will have doubtless heard of my moving here. I arrived at New York on the 18th June, and making Sacramento on the 25th of that month I made a stay of a few days in Northern California in the lovely valley of Loomis of the Citrus Colony, which by-the-bye is largely made up of English gentlemen. I was greatly pressed to stay, and was very much tempted to do so, as much for the proximity to the railway, the capital town, and fertility of soil as the social attractions but did not; I was afraid that though handsome returns could be expected I was hardly strong enough for the labour required.

The colony being the youngest in California, hired labour was hard to get and very expensive. What do you say to strawberries paying there at the rate of $1,800 per acre! A man could only cultivate a few acres at a time, as you may suppose, the ground requiring constant cultivation and irrigation.

A truly lovely country nature-planted with immense live oaks and waving with natural grasses and wild oats self-sown. I had of course to rough it, sleeping double and washing outside, sharing the basin with half-a-dozen rough quarry-men, who slept in the grounds outside the express office (my hotel) in a tent. Having enough of that I took ticket for this country, and was staying some time with an old Ceylon friend, before moving into my own quarters, and an old acquaintance of yours of the name of J. G. Morrison who is married and settled here. The address heading of my letter is my own ranch of 40 acres of bean land. This land lies above the mouth of the Santa Clara river facing the grand Pacific, with the barrier islands of Auacapa (see map) and Santa Cruz on the right and the Guadalasca range across the river to the left—with Red Hill mountain standing grand and bold in the clear soft blue of the sky.

My attention at present is largely engaged in the erection of a house and windmill,* having just completed the boring of a 264 feet well. All details of daily life have to be done by oneself,—cooking, grooming of the horses, washing, dusting &c.; monotonous, continous work but not too hard. The out-door work all can be done by one not too strong and who like myself has never done hard manual work before, with perhaps the one exception of ploughing—the original ploughing of the land. But the neighbouring farmers will do at a day's pay—generally from $1·50 to $2·00. I like the life, the country and the people (now that I know something of them) greatly and would not exchange with anyone. It has a glorious climate and room for 30,000,000 of people where there is not but 1¼ million. I say, come one, come all. There is no need of American naturalization, one can stick to the old flag and yet take part in Brother Jonathan's dollars—pronounced *darl*-lers.

There is much to interest in this, one of the oldest historical spots on American soil. It was here Padre Junipero first landed for the conversion of the Indians, and finding a quiet sea, a fair harbour, and a populous, gentle, kindly people to welcome him, called it Buena Ventura—"good venture"—and here he erected the quaint old adobe (sun-dried brick) church which still stands in the main street of the town of Ventura (five miles for Santa Katrina)—enshrining (surrounded as it is with modern wooden buildings of every conceivable American bad-taste) in its somewhat gloomy interior

*Windmill power ought surely to be largely utilized in Ceylon.—ED. *T. A.*

a life-sized figure of the Saviour, too realistic in its gory details but with an old-world pathetic beauty yet about it. The audience consists entirely of the Spanish-Portuguese-Italian community, and comprising a number of half-breeds. The Indians pure have long been extinct. The Padre is a curiosity in himself, has been many years here, and wears a beautiful beard down to his waist. He is said to be the only R. C. minister permitted to do so in America and required the Pope's dispensation. The old gentleman used to suffer from severe catarrh, and something warm about his throat was the only cure. There is lying all about me a fund of interesting information and gossip for half a hundred letters and which I shall be pleased to repeat, from time to time, to the readers of the *Ceylon Observer*.

REPORT ON THE PROGRESS AND CONDITION OF THE BOTANIC GARDEN, ADELAIDE, SOUTH AUSTRAIA, DURING THE YEAR 1889.

By R. SCHOMBURGK, DR. PHIL., DIRECTOR.

Dr. Schomburgk, although verging on fourscore, is still at his post in charge of the beautiful gardens at Adelaide, and has issued his report for last year. From this document we quote as follows:—

The rainfall in and about Adelaide during 1889 was the most copious on record, as may be seen from the tables of the Government Astronomer, an extract from which is subjoined. The largest quantities of rain fell in the months of April, May, June, August. and September.*

The atmospheric conditions which prevailed during the summer months were abnormal, and this was the case during January and February also. Indeed, during these two months some of the most trying weather ever known was experienced. There were few hot winds, and the thermometer ranged between 90° and 106° Fahr. in the shade and from 150° to 160° in the sun. The quantity of moisture in the air was unusually great, and it rendered the climate for the time being as uncomfortable and as distressing as it is in Brisbane, and, at times, in Sydney. The beneficial effects of the season have extended over the whole colony, and have greatly tended to promote the progress of agricultural and pastoral enterprises, but more especially of the former, which sorely needed some stimulus after the bad effects of several previous dry seasons. The wheat crops in some districts would have reached 15 and 20 bushels per acre, or in many cases even more, but for the appearance of that scourge "red rust," which, in many places, destroyed whole crops, and in consequence the average wheat yield was only 7 bushels per acre.

The fruit crop was a fair average one, and the fruit itself generally of fair size and good flavour. The produce of the vineyards has also been satisfactory, both as to quantity and quality. In the Botanic Gardens the flower parterres, borders, and carpet beds have desplayed a wonderful variety of colors, produced by the different flowers which flourished during the summer months, such as Amaranths, Zinnias, Portulacas, Tagetes, &c. Their appearance generally has been superior to anything previously seen in the garden, and has elicited the warmest expressions of admiration from the visitors to the garden. The roses, however, suffered greatly from the rain, and from the scorching sun in November and December, which destroyed the small flower buds, so that last year was not a favourable one for the development of the large collection of roses.

New Fodder Plant.—The wood lathyrus—*Lathyrus sylvestris*, Linn.—No forage plant has ever created so much surprise amongst agriculturists in Germany as the wood lathyrus. Although indigenous in both England and Germany, its valuable properties—long unknown—have only recently been discovered. The *Register* newspaper was the first to call attention to the plant by reproducing and extract from the *North British Agriculturist*, which had been forwarded by Mr. J. Christison, of Clare, who expressed the opinion that it merited the attention of South Australian farmers. The *Register* truly observes—"That farmers may be pardoned for hearing with a feeling of caution, merging with distrust, of some wonderful new fodder plant, which will grow enormous and most profitable crops on even the poorest soils, and which seems able to grow luxuriantly in any climate. But the facts that have just come to hand should go far to convince even the most sceptical that a most valuable plant is now being placed at the service of Agriculturists." It is further said that—"The plant belongs to the order of *Leguminosæ*, and, as such, is able to forage for itself in regard to nitrogen, of which it obtains abundant supplies either from the lower strata of soil or from the aboundless atmospheric stores. Even in the poorest soils it grows a crop which will yield at least 4 tons of hay per acre. The nutritious value of the crop, as determined by chemical analysis, is about twice that of clover hay. The Prussian Minister of Agriculture has been so deeply impressed with the great value of this plant that a Government order has just been issued granting to every Prussian landholder who cultivates the plant on his waste land a subsidy of 30s. per hectare, a hectare being equal to two and a half English acres. As a consequence of this recognition of the plant all the avilable seed of the cultivated plant has been brought up at famine prices."

Having read this glowing account of this lathyrus, I made it my duty to obtain some seed from Germany. It reached my hands in January, and, in order to test its vitality, a few seeds were sown in in a flowerpot. They came up well, and the plants have, up to the present time, grown luxuriantly. The plants have been well taken care of, so that their healthy growth can hardly, as yet, be taken as proof that they will thrive equally well in open ground. We must, therefore, wait the result of the experiments which have been made in this way. With the seed I received an official report, made by the director of the well-known agricultural college in Germany, at Poppelsdorf, near Bonn, upon the plant, which says—"The wood lathyrus, or flat pea, is found growing wild in the forests here and there, especially on basaltic formations. The stalks trail along the ground often to the length of 15ft. The creeping roots also spread to an unusual length, and in consequence absorb from the poorest soil the most minute particles of nutritive matter contained in it for a great distance around the plant. It does not need any manure, and it resists drought. The wood lathyrus obtains a great age, and a specimen of a congener, the *Lathyrus latifolius*, has grown for no less than seventy-five years on the one spot.

The wood lathyrus has been experimented on and improved for several years by two gentlemen—Messrs. Wagner and Kühnemann—with the most satisfactory results. Even in the poorest soils the plants have considerably improved. For the first two years they grow slowly. During this period their rapidly spreading roots absorb the nourishing matter necessary for the development of the plants. After the time mentioned the growth is most remarkable, the crops yielding from 4 to 5 tons of hay per acre. The plant is also remarkable for its richness in proteine contained in the straw, which has been found to range from 21 to 24 per cent. Plants cultivated in sandy soil, and in heavy clay, possessed from 24 to 26 per cent., and in some samples of the straw of the lathyrus as much as 29 per cent. has been found."

The straw is richer in nutritious properties than any other; with, perhaps, the exception of lentil straw. A chemical analysis of some of the straw gave the following results:—

Proteine	13·97
Fatty matter	3·43
Woody fibre	37·98
Non-nitrogenous substances	39·00
Mineral matter...	5·62
	100·00

* The exceptionally high rainfall was only 30·872 inches not equal to that of our driest station in Ceylon. —ED. T. A.

The other day, on planting out the seedlings of the wood lathyrus in the open ground, I was agreeably surprised to note the wonderful development of the roots. Some of them were 18in. long, and some as much as 2ft., with a thickness equal to that of an ordinary writing quill. This fact confirms the statement of the director of the Agricultural College, that the roots develop and spread to an unusual length and depth.

The seed, as I mentioned, was sown at the end of January, and the plants were planted out in the commencement of June. The roots during that time had attained an extraordinary length and thickness. I do not think that there are many plants the roots of which in so short a period attain such a remarkable development. I believe that I have at length succeeded in introducing a useful forage plant, which, having regard to its unusual root system, is likely to suit our dry climate in an eminent degree.

I cannot avoid again calling attention to the well-known Cocksfoot or Orchard Grass (*Dactylis glomerata*, Linn.), and once more recommend it for more extensive cultivation than it receives. It is one of the most valuable of the grasses for permanent pasture that have been introduced into the colony. It is of vigorous growth, does well in almost any soil, and is much relished by cattle and sheep. It stands both feeding down and cutting down, and grows again with great rapidity. It is one of the most prolific grasses and possesses considerable nutritious properties, and is valuable for fattening purposes.

Museum of Economic Botany.—This popular institution loses none of its attractiveness, indeed, it is always made a favorite place of resort by the visitors to the garden. The large and valuable collection of exhibits contained in the building has been still further extended during the past year.

The continuous increases of objects in the museum makes it evident that we shall soon be much pressed for space in which the donations which are constantly coming in can be advantageously displayed. It is most gratifying to find that the collection forms one of the most attractive features of the garden. Visitors appear to be much impressed with the interesting features of the objects themselves, as well as with their simple and practical arrangement.

The Library has kept pace with the general extension of the objects for which our institution was established. A large addition has been made to the number of standard works, both botanical and horticultural, which are now available for reference. The latest issues of the reports of the Smithsonian Institue, and the reports of the Geological and Natural History Survey of Canada, possess the highest scientific value. The pamphlets issued by the different botanic gardens in botany, especially those issued from the Imperial Botanic Gardens at St. Petersburg, merit particular notice and attention.

THE COCO-DE-MER IN CULTIVATION.

With only one exception, the palms of the Seychelles have long since proved amenable to cultivation in our tropical plant houses. The genera *Stevensonia*, *Verschaffeltia*, *Roscheria*, *Latania*, *Dictyosperma*, *Acanthophœnix*, *Hyophorbe*, and *Chrysalidocarpus*, which are peculiar to this small group of islands, and which rank amongst the noblest of a noble family, are all well known in European collections of palms, their cultivation presenting no more difficulty than that of tropical plants generally. The coco-de-mer or double coco nut (*Lodoicea seychellarum*) has, however, so far proved unmanageable under artificial treatment, notwithstanding that many attempts have been made to establish it at Kew and elsewhere. So long ago as the year 1827, Sir William Hooker publish a series of figures and a description of the coco-de-mer in the *Botanical Magazine*, and recorded the arrival of living nuts of it at Kew, where, he says, "we cannot doubt of soon seeing them flourishing in our stoves." But they failed to grow, and although dozens of nuts have since been tried at Kew, not one ever got beyond the first stage of germination.

The absence from our collections of living examples of this most remarable palm is most disappointing to all students of the order. At Kew we have lately been successful in establishing living plants of the Ita (*Mauritia flexuosa*) and Bussu (*Manicaria saccifera*) palms of the Demerara swamps, and the Doum (*Hyphœne thebaica*) and Palmyra (*Borassus flabelliformis*) palms of Africa. These successes stimulated the desire once more to obtain a living plant of the coco-de-mer.

Application was therefore made in January last year, through the Secretary of State for the Colonies, for a supply of fresh nuts from the Seychelles, and at the same time directions for packing and forwarding the nuts were sent to Mr. C. Button, the Conservator of Forests at those islands. The Administrator, Mr. T. Risely Griffith, took a warm interest in the matter, and through his kind exertions several consignments of nuts were received, of which four germinated. Two of these are probably too weak to live, but the other two are in a most promising condition. The strongest has a radicle 3 feet 8 inches long, and 12 inches in circumference at the end where the plumule is developed. This is now a foot long, and is pushing a perfect leaf.

In a note by the late General Gordon on the germination of the double coco-nut, it is stated that the nut is planted horizontally, without the husk, when it sends out a sprout some 12 feet long, which pushes up the young plant at a distance of 12 feet from the nut. The longest "sprout" we have had at Kew has not exceeded 4 feet. Nor can it be made to grow horizontally, the point turning down perpendicularly however often its position may be altered. At Kew the nuts were planted in a bed of coconut fibre, and kept at a temperature of 80°-85° F. They were planted in June 1889.

Mr. Button had kindly undertaken to plant a nut in a Wardian case, and treat it according to our instructions until it had germinated and developed the plumule before despatching it to Kew. A nut thus treated arrived in July last in the most promising condition. The radicle is 1 foot 10 inches long, and the plumule is 7 inches in circumference at the base. It has a stout sheath-leaf, and a normal leaf 3 feet 2 inches long, 3 feet wide, with thirty-six folds. The midrib is curved, and the blade at present folded double. The texture is exceptionally firm, and the colour a deep green.

Full-sized trees of the coco-de-mer attain as much as 150 feet in height, with a smooth trunk about a foot in diameter. The leaves form an immense crown on the top, and each leaf is 20 feet long and 10 or 12 feet wide. The male and female flowers are on separate plants: the male inflolescence is shapped like a huge willow catkin, its length being 5 to 6 feet by 4 inches in diameter; the female is from 2 to 4 feet long, and it bears from six to ten fruits, each of which weighs from 25 to 30 pounds. They take seven years to mature and sometimes hang two years on the tree after they are ripe. The process of germination extends over about two years. According to General Gordon, the trees begin to fruit when about forty years old, and attain maturity in 120 years.

Royal Gardens, Kew. WILLIAM WATSON.

[The coco-de-mer is at present confined to Praslin and Curieuse, two of the islands of the northern group of the Seychelles Archipelago. It undoubtedly runs some risk of extinction from the long period which the nuts take to germinate, and from the fact that, the trees being of different sexes, isolated females may easily escape fertilization. Its cultivation in the Botanic Gardens of the tropics is therefore of considerable importance.

Plants have long flourished in the Royal Botanic Gardens at Peradeniya, and the following extract from a letter from the Director, Dr. Trimen, F. R. S., to Kew, records the interesting circumstance of a male plant having flowered:—

"Peradeniya, August 12, 1890.

"You will be interested to hear that one of our Lodoicea palms put out a ♂ inflorescence last month. The tree is thirty-nine years old. To my great dis-

gust, when the spike was about 6 inches long, some visitor cut it off with a blunt knife, and I found it on the ground. The flowers were all formed, and the structure exactly as described by Sir W. Hooker in the *Botanical Magazine*. I hope my other tree will prove ♀, but that is much younger."

Sir John Kirk also succeeded in establishing the palm in his garden at Zanzibar.

The Government of the Seychelles has long watched with care the preservation of the existing groves of the palm, and pains are now taken to fertilize the female plants artificially, and to plant the seeds.—W. T. T. D.] —*Nature.*

MR. E. ELLIOTT ON THE COST OF PADDY GROWING.

Mr. Elliot writes in answer to enquiries from the local "Times":—

"You and others, I find, misunderstand the scope and intention of my experimental cultivation and the publication of the results. The primary object is of course to show those amongst whom we are working that, by using the ploughs and incurring some little additional outlay quite within their means, much better crops can be secured. At the same time I have endeavoured to discover the *cost of growing paddy*, working on a ready money basis. I have necessarily had to work rather expensively with native assistants, on whose outlay I have a very imperfect check and who do not stint the cultivation. In spite of this my Galle experiment worked to R16 per acre (exclusive of taxes), and at Nintavur it worked out to R17·50. The information thus acquired is, I think, valuable, for it refutes the absurd *estimates* of the cost of cultivation advanced by many, such for instance as that given by Mr. Panabokke for Saffragam to the Grain Tax Committee.

"I have also given the return I got at Ninvtaur and shown that I went into a village, hired at current rates a parcel of land, cultivated it, and made a profit of R694 on an *outlay* of R612 in under six months (rent and taxes were paid after crop as customary and so entailed no outlay.) This was done in an unfavorable year, but in an irrigated district. This is the broad fact I wish to make known. Everybody can utilize my figures and see how they would be affected by the surroundings under which he can, or does, undertake paddy cultivation—for instance the district in which he hires the land; if he can or will or is obliged to do without irrigation; if he has his own money and cattle to work with, or must burrow and if so at what rate.

"These differ in each case and in every district, and everybody must work them out for himself, I consequently made no allowance for cost of land, interest &c; and as for contingencies the crop was a moderate one. For machinery I had only 5 iron ploughs and 4 native ploughs costing altogether about R40, on which I have charged R10·75 for depreciation and repairs; they are available for future operations.

"I added particulars of my other experiments to be perfectly above board and also to shew that, even in an unprecedented year of failure, there bad been secured a profit (exclusive of rent, but after providing for taxes) of R819 on an outlay of R1,441 from 84 acres of land.

"A man can and does in this district cultivate 7 to 10 acres at one time, so that if the cultivators had been also the owners of the lands each would have had R70 to R100 to go with; but if the cultivators were not the landowners they would have probably had to pay about this for rent and had nothing beyond their wages for the time they were employed.

"I have my own views regarding paddy cultivation as carried on by natives, but cannot enter fully into them here except to say that, the more I look into it, the more am I convinced 'it pays' and if carried out on a proper basis it is probably the best paying produce ever grown in Ceylon. Just as with tea, coffee &c., there are places and circumstances under which paddy growing will *not* pay, and where it ought not to be tried; but this does not affect the real question. Still another branch of the question is whom does it pay as carried on by natives. This is a very difficult matter to say between non-resident landlords, money-lenders, and untrustworthy tenants; but because one cannot answer that question do not jump to the conclusion that 'paddy does not pay'. Again, in discussing the resources of these engaged in this branch of agriculture remember even in Ceylon "man does not live by paddy alone"—or by *one* cultivation per year. It is only *one* of his occupations in Ceylon.

Pray do not mix up my experiments with these considerations. My figures I think place beyond doubt that paddy can be made to pay handsomely. Others who have gone into the question and worked on a proper basis will tell you the same. Mr. Julian Dias told me recently it pays him 25 per cent. on the selling price of his field, and that no paddy land in the Western Province is worth less than R150 per acre—here R50 is a very good average price. The Kegalle Mudaliyar's experience also supports my views. If therefore any class allege paddy does not pay there are collateral reasons which must be searched for and examined, and the whole industry should not be decried wholesale, as is done in some quarters, because the expectations of any class interested are at times not realized."

THE BAMBOO.

There are countries where it seems to supply almost every human requirement, and where the feathery masses of its foliage, drooping, like the weeping willow over road and river and village, bespeak an ideal of life beyond the reach of less primitive communities. Here man is unspoiled by artificial wants, untouched by the march of thought or of science, and nature unsolicited supplies with lavish hand his simple needs. It is an ideal which it seems almost sacrilege to disturb, and in presence of which the highest aim of the foreign intruder should be to preserve its primary conditions intact. No better example can be cited of the land of the Bamboo than one of those Indo-Chinese provinces, of which Burmah is the best known to Europeans.

Like the fir in northen climates, it is the bamboo which here gives an unmistakable stamp to the rural landscape, while it is literally the framework and foundation of nearly every work of man. It is no exaggeration to say that the same jungles which give cover to wild animal life of every form and tribe, exert a beneficent influence also on every step of life of their human inhabitants.

The Burmese child plays with bamboo toys in a house of which roof and walls and floors are for the most part made from the same generous plant. Through boyhood and manhood and old age this helpful comrade is ever by his side. On land or water, in peace or war, in the homes of rich and poor, in art and manufacture, in the market and the field, at feast and funeral, this is the substance of all that man most needs and values for ornament or use.

Town and villages are built from its stems and leaves; the fisherman'e rod, and float, and raft; the hunter's snare; it bridges the torrent, bears water from the well, and irrigates the fields. It is food and medicine for cattle, and even for men; and there is music, too, not only in the rustle of its leaves, but in its woody heart, from which more than one musical instrument is made.—*Blackwood's Magazine.*

THE PLANTING INDUSTRY IN JAVA.—Sugar crops in the native principalities of Java have all been gathered in with unsatisfactory results, owing to the prevalence of canker among the cane. Sugar planters have taken to planting larger stretches of ground with cane to make good the smaller yields. The tobacco yield shows a falling off, and prices have so gone from bad to worse that leaf from the island has become almost unsaleable at Amsterdam. Coffee on the other hand, promises well for next year, —*Pinang Gazette*, Nov. 7th.

COLONIAL CAREERS FOR YOUNG MEN *VS.* FARMING IN ENGLAND, IN A NEW LIGHT:

WHY NOT "ROUGH IT" IN RECLAIMING DERELICT HOME FARMS IN THE OLD COUNTRY?

The writer in the *Spectator* of "A Commentary in an Easy-Chair" has the following deliverance in reference to young men looking out for a career in tropical plantations, Australian farms, American ranches, &c.:—

"There appear in our magazines and papers periodically accounts of the doings of the young men who go out to the Colonies, who work in ranches, and settle in the backwoods, generally reported by proud and happy fathers whose glory in their hard-working boys is too touching in its vicarious vanity to be lightly disturbed. And yet the life which is described to us with so many virtuous flourishes is the hardest life that can well be imagined,—a life without comfort, without solace, a hard struggle at first for the barest living, which slowly grows into rude plenty, and perhaps in the end to prosperity in the ordinary sense of the word, but at the sacrifice of almost all that is beautiful, and much that is good in life. Hard weather and hard work, the endless, ever-recurring routine of primitive life, the conflict with all the elements, and rudiments of existence,—still more the abandonment of everything that is above or beyond the common day: these are the conditions of that life, which in so many cases seems the only resort for the boys nurtured amid every sweetness and comfort, lodged and served and fed, and even educated, as well as Princes are and much in the same way. To arrive at independence and a primitive wealth at the end may be a satisfactory thing to think of; but the sacrifices that are made to secure this are overwhelming. I have often asked myself whether these youths might not do as well if they settled, say, on a derelict farm in England, where unhappily there are many, and worked it as they do their Colonial patch of land, or bit of primeval forest. Supposing they had the courage to make themselves cowboys at home? not only to scorn delights and live laborious days, but to scorn appearances as they would do on the other side of the Atlantic, and use their faculties here as they do there? Could this be done with the possibility of a home behind them, in which to take refuge for a Christmas, for a holiday now and then, which would keep them within touch of the life to which they were born, might not their native fields be as practicable as Manitoba, and the primitive living be secured, and the primitive advantages, without so tremendous a sacrifice? I do not pretend to have sufficient knowledge to answer this question; but it is one that seems worth asking at least. I remember the time when spade-husbandry and the reclaiming of waste lands were considered to be a new gospel with an answer to all social problems in it. Times change, and all the panaceas change. Miss Martineau, in her series of tales on Political Economy—tales which it would be so strange to read nowadays, though they had the greatest effect in their time—has one (at least) to prove the sinfulness and waste of village greens and commons, which were so much land lost to the commonwealth. Nowadays we cling to our commons, and think land never so well bestowed as when it is made into recreation-grounds and parks for the people. But even now, though I am told that corn does not pay the growing, there is something in the sight (or even hearing) of fields lying untilled and desert which gives an ache to the heart. Could not the primitive life of labour be accomplished on them as well as in Manitoba? No doubt there would be difficulties. There are difficulties in everything: but are they invincible? I am unable to answer the question, but it seems one that is worth the asking, practically, as well as in words.

I have heard at least of one kind of farm upon which an experiment has been tried with remarkable success, and which no doubt has preserved at least one (there may be many) young Englishmen from Manitoba or California. This is a pheasant farm established on a bit of moorland by a quick-witted and practical-minded member of the class aforesaid, in which between birds, made ready to stock the coverts and furnish forth the battues of the sportsman, as well as the homelier necessities of the poulterer—necessities not unthought of, it is said, in the most aristocratic circles—and eggs, that make the birds, a few paternal acres (not at all adapted for corn-growing) have been made to produce a very comfortable income, with greater and greater possibilities for the future. This is one of the accidental possibilities which men occasionally strike out, when they have the instinct and spirit of success in them. And I think it very possible that Mr. Gladstone's suggestions about poultry and jam, though they have not been operative in changing the views of the farmer class, might equally answer in the hands of the youths predestined to be cow boys, if nothing better should turn up. There are, no doubt, many who would rather rear chickens at home and help to take away the reproach of England in the matter of fresh eggs, than herd the cattle in a ranch, or keep sheep on the Australian wilds, or pig in a log hut in Canada or California, through the most beautiful period of their lives. The jam might be trying if it required personal superintendence. One asks oneself whether one is justified in suggesting any such expedient in the face of the fact that there will not be standing-room in the British Islands within a few hundred years, according to the best calculations? This, however, scarcely matters so much when we reflect that, according to the same authority, a few hundred years more will see the same condition of affairs throughout the world, and there will be standing-ground nowhere,—in which case it does not matter very much, evidently, what we say. There will be peace in our day; and the world, so often threatened with all manner of catastrophes, has the chapter of accidents in its favour, and may go lumbering on for more centuries than any statistician would imagine. But in the meantime—why could not a ranch be tried in Essex, for instance, where I hear there is much unemployed land? If the boys are to be cowboys and farm-labourers upon whom we have spent so much care and love, why should they not buckle to, gird up their loins, and try it at home? It may be impossible; but, again, it might not be impossible. Of course the experiment would have to be conducted in the same way in which it would be conducted in Manitoba,—no gentleman-farmering, but hard work according to the Colonial or backwoods type, in which places gentleman-farmering certainly would not pay.

OUTLYING PORTIONS OF THE STRAITS SETTLEMENTS: PLANTING RESERVES.

We have received copy of a Sessional Paper embodying "Notes of Visits made by Sir J. Frederick Dickson, K.C.M.G., to the Settlements of Penang and Malacca and to the Native States of the Malay Peninsula during the period April-September 1890, while Administering the Government to the Straits Settlement," from which a few quotations will be of interest to Ceylon readers:—

April 13th, 1890.—Left Singapore in the "Sea Belle" at 1 p.m. with Lady Dickson, Captain Massy, R.A., A.D.C., and Mr. C. O. Blagden, Private Secretary, bound for Klang in Selangor.

April 15th.—The first thing in the morning visited the Botanical Gardens in company with Mr. A. R. Venning, who has laid them out with much taste and success.

May 14th.—Left Penang Hill at 6 a.m. On reaching the road at the bottom found the Resident Councillor (Mr. A. M. Skinner) and other gentlemen waiting to accompany me round the Waterfall Gardens. They are making great progress; the collection of foliage plants is becoming one of large and varied interest, and the grounds are being admirably developed by Mr. Curtis, the Assistant Superintendent of Forests in charge of the Gardens.

June 21st.—Left Singapore in the "Sea Belle" for Tanjong Kling.

June 29th.—Accompanied by the Resident, Mr. Berrington and Mr. Pieroe, Acting Superintendent of Works, I rode up to Terachi in the morning. The road passes through a beautiful and highly cultivated country, village after village in well-cared-for compounds or orchards lying in the valleys up which the track runs. Ayer Sejuk in Terachi I was met by the Penghulu of Terachi and the neighbouring Chiefs, who had created a *basie*, adorned with flowers and palms, in which breakfast was served.

The difficulties of traversing the Bukit Putus range by railway trace have been overcome, and I was able here to see how easy the trace will be down the Terachi and Muar valleys to Kuala Pilah, and how much the country, thickly populated as it is by a permanent Malay agricultural population, will benefit from the construction of a railway, which will reach Kuala Pilah in less than 22½ miles from Seremban, with a tunnel of 330 yards at Bukit Putus, where the line reaches its highest elevation of 713 feet above sea level (h. w. spring tides).

July 2nd.—Left Tanjong Kling in the "Sea Belle" and, after visiting the light-house on Pulau Undan, steamed on to the mouth of the Muar, where a launch was in readiness to take us up the river. At Bandar Maharanee I was received by the Acting Resident, Tunku Othman, and by Messrs Garland and Faithful, who have been engaged on extensive waterworks for the supply of the town, and also on a narrow gauge line running at present 8¼ miles along the coast to Parit Jawa.

The line is on a 2-foot 6-inch gauge, and though not yet ballasted, is open for regular traffic, and is earning, in addition to its working expenses, something under 5 per cent on an expenditure of $75,000. It is proposed to extend it about 17 miles to Batu Pahat. The areca-nut groves through which it passes extend along the sea shore about 30 miles and have an average breadth of 5 miles. After a drive round the town I went up the line as far as Parit Makar, about 4½ miles from Bandar Maharanee, and then returned to Malacca for the night.

July 19th.—Arrived off Kuala Pahang about 11 a.m. Found the "Porpoise" there, and was met by the British Resident, Mr. Rodger, in the launch "Ethel," which took us over the bar and up the river some 7 or 8 miles to the Pekan, where the river banks and the landing stage had been prettily decorated by the inhabitants, a beautiful arch erected by the Sinhalese residents forming the centre of the decorations. Later in the day walked round the town. The Gaol in particular is noticeable for the clever manner in which the simplest and cheapest materials have been used to make a secure prison. The palisade is made of pointed palm trunks which are fixed side by side in the ground and held together by transverse bars of timber, not nailed on to the uprights, but running through holes pierced in the palms and threading them together into a fence very difficult to scale.

July 22nd.—Found the "Porpoise" anchored off Tringganu about 2 miles from the shore, and took up a berth just inside her after passing a very numerous fleet of fishing boats putting out from the mouth of the river. We climbed up to the old fort which commands the Kuala. This looks more like an observatory than a fort, guns of obsolete patterns are mounted at all sorts of angles on slender wooden pillars and pointed to the sky like telescopes, but it commands a fine view. The town is of considerable size, and the large fishing fleet seen in the distance bears witness to considerable enterprise on the part of the inhabitants. The country inland and along the coast is densely covered with coconut palms, but it was evident that the beetle which has done so much harm in the Colony is in possession also at Tringganu, and a great many trees along the coast have been destroyed by it.

July 26th.—Reached Singora at 7 a.m. A Siamese dagoba on a conical hill makes a prominent landmark near the mouth of the river; groves of coconut palms and casuarinas (Malay *rhu*) were seen here along the shore, as at most of the places we visited in these parts, and as usual, too, the coconut palms near the shore had suffered considerably from the beetle. The natives say, however, that its ravages are limited to a narrow strip of land next the sea. The Governor, whose great-grandfather was a Chinaman, is a very intelligent man, and shewed me several photographs of his own taking, and a good lathe with several very creditable productions of his own from it.

Retired from the busy part of the town is a well kept enclosure containing several Siamese Buddhist temples, some of them most elaborately decorated and extremely curious, and, in some of the details, beautiful.

Sept. 2nd.—Arrived at Penang at 8 a.m.

Sept. 3rd.—An interesting case of *latah*, or imitative madness, in some respects like "echo" insanity, was brought on board for Dr. Ellis to see. Saw the Superintendent of Police, Mr. Bell, in reference to the action taken in Executive Council yesterday, and after despatching letters to Singapore, weighed anchor at 11 a.m., leaving Mr. H. Trotter in charge during the absence of Mr. A. M. Skinner, whom I added to our party as Consul for the Siamese ports of the West Coast of the Malay Peninsula, with Mr. F. T. Thorold of the Perak Service as my Interpreter.

We left Captain Cameron in Penang to meet Mr. Kelly, late of the Indian Survey Department, who is going to carry out the Penang Survey on the system recommended by Colonel Barron, B.S.C. (*see* Sessional Papers, 1887, Appendix No. 11), and Mr. Bostock, who comes out from England to obtain particulars to enable Sir John Coode to report on the best system of wharves for improving the Port of Penang.

Sept. 8th.—Had an interview with Mr. John H. Bostock, who has come out from England to report on the best means of giving Penang Harbour such wharf and warehouse accommodation as the trade requires. Also with Mr. F. W. Kelly, late of the Indian Survey Department, who has taken service here to carry out the cadastral survey recommended by Colonel Barron, B.S.C.

September 10th.—Up at 5 a.m., and at an early hour we bade adieu to our kindly host, and sailed some two hours later than we had intended at 7 a.m. for Goh Mak, a low alluvial island formed at the mouth of the Punga River. Up the river we passed close under these perpendicular cliffs, which rise abrupt from the water's edge to a height of some 1,200 feet, clothed from foot to summit with small trees of great variety. Had a day amidst natural scenery which it would be difficult to find equalled anywhere in a ten hours' sail. Punga is a small State with some tin mines, and a population of Siamese, Chinese and (a few) Malays. The Raja is a veritable "Lord of the Isles," but the right to collect the edible birds' nests which are found here is in the hands of the Malay Raja of Kedah, not, as has been supposed, a survival of the Malay supremacy by sea of former days, but as a farmer of this part of the Revenues of Siam!

It was fortunately one of the days for the market held here twice a week, and the whole length of the main street was lined with stalls kept by Chinese men and by Siamese women, in which vegetables and fruits, fish dried and fresh, and various kinds of country produce in abundance were displayed for sale. Close to Tap Tian we had passed through extensive fields of splendid pepper vines—the finest grown in the Peninsula—owned chiefly by British subjects—Penang-born Chinese. The pepper here is grown climbing on living dadap, on the Sumatra system, instead of on dead sticks like hop-poles. The soil is deep red laterite thoroughly disintegrated. Trang is closely connected with Ligor on the East coast, there being between the two places one of the routes across the Peninsula; and it was by this route that Antonio de Miranda de Azevedo, the second Envoy sent by d'Albuquerque to Ayuthia—the then capital of Siam—made his journey, going from Malacca by sea to "Taranque" and thence by land with horses and draught oxen. The roads in the early part of the 16th century must have been better than now, as they are not good even for elephants and would be absolutely impassable for draught oxen. The population is Siamese, Chinese

and Malays, and here, besides the languages of these three races, there is spoken the patois known as Samsam, peculiar to the Siamese who have become Muhammadan.* The term "Samsam" is said on the spot to be a corruption of "Siam-Islam."

September 18th.—Went up the river to visit the graves of Mr. Birch and the soldiers who are buried with him at Bandar Bharu, and the monument erected to the former at Pasir Salak. Mr. Wray had kindly made excellent arrangements for the journey, and we left the "Sea Belle" at 6 a. m. and drove across the narrow neck of land behind Teluk Anson to Durian Sabatang, saving thereby five miles of river, and met there two of the Perak launches which had been sent round earlier with the servants and provisions. After an hour upstream in the steam-launches, we transhipped into three house-boats at Bandar, where the river shoals considerably, and, poling upstream, arrived at 8·30 at Bandar Bharu, seventeen miles above Teluk Anson. Here we were met by the Penghulu and headmen, and walked up to the enclosure containing the graves, which is about three hundred yards from the river, and is approached a well kept path bordered with flowering shrubs. The enclosure itself looks very nice and well-cared for. It is surrounded by an iron railing, and in the middle of a grass plot is an ornamental railing enclosing five graves with crosses of polished granite. They cover the remains of Corporal Fay, of the 10th Regiment, killed at Kuala Biah on the 7th November, 1875; of Captain William Innes, R. E., killed at the same time and place; of James Wheeler Woodford Birch, British Resident, Perak, assassinated at Pasir Salak, 2nd November, 1875, aged 49; of Gunner R. Hardy, R. A., died in Perak, 17th December, 1875, aged 32; and of Private W. Smith, 3rd Regiment "The Buffs," died in Perak, February, 1876. There are also three unknown graves in the enclosure. On rejoining the boats, we went 7 miles higher up the river to Pasir Salak, arriving there at noon, and finding that preparations had been made for our visit. Raja Musa, the younger brother of the Sultan Abdullah under whose suspices the murder was committed, and who was himself exculpated when the murderers were brought to justice, met us with a large number of the natives at the landing place just opposite the monument. This stands about 30 yards from the river bank in a small enclosure and is an obelisk of unpolished granite bearing an inscription in Malay and English on a slab of white marble. The English words are:—

"This, the site of the Fort of the Marajah Lelah, and near the spot where the British Resident, J. W. W. Birch, was treacherously murdered on the 2nd of Nov. 1875, is ordered by the Government of Perak to be for ever kept desolate and uncultivated."

RUSSIA AS AN OUTLET FOR INDIAN TEA.

To the Editor of the *Home and Colonial Mail.*

SIR,—I think a brief account of a visit which I recently made to the country of the Czars may not be without interest to many of your readers. The principal object of my journey was to endeavour to ascertain *on the spot* what were the prospects of introducing Indian taes into that country, and to this end I was greatly assisted by the kindness of friends, through whom I was furnished with several good mercantile and other introductions.

At Petersburg, whither I first directed my steps, I had an opportunity of discussing *tea* with several persons connected with the *trade* as well as with other commercial people, whose acquaintance I made on the *Bourse*. I was strongly advised, however, to proceed to Moscow, which is the chief centre of the wholesale trade. I accordingly went on to that city, and was sufficiently encouraged by what I saw and heard to remain there for eight days.

Here I had the advantage of the assistance, as well as the benefit of the experience, of Mr. Rogivne, the representative of the Ceylon planters, who had been at work, first for five or six weeks in Petersburg, and latterly in Moscow, introducing his Ceylon teas to the notice of the wholesale trade as well as to the large retail houses, such as Popoff, Kousnisoff, &c., &c. We visited (either separately or together) the principal tea merchants, and tasted with them samples of both Indian and Ceylon teas. By most of these firms I was very kindly received, more particularly by the firm of Wogau, by Bergmann Bros (who represent Fred. Huth & Co.'s house), and by the representatives of the Koenigsberg Commercial Association; also, both in Petersburg and in Moscow, by gentlemen who were formerly the tea specialists in the powerful house of Knoop, when that firm made tea one of its specialties.

As was, of course, to be expected, most of the "*trade*" expressed the opinion (just as was done in England formerly) that it would take a long time to *change the Russian taste*. All, however, complained of the great deterioration which was taking place in the quality of China teas, while the Russian taste demanded, *no* worse, but *better* teas. Most of the firms appear to be kept well supplied with samples, both of Indian and Ceylon teas, by their London agents; but great expense and delay attends the introduction of Musters, while, owing chiefly to the delay, business in them is usually very difficult to carry through. The teas apparently which seem, most nearly, to approach the requirements of the are *medium* or *good Pekoes-Leaf teas without dust or broken*, either Ceylons or Darjeeling and Dooars teas; but there were also Assam and Cachar teas among the samples which appeared suitable.

Coarse Indians (*i.e.*, Souchong grades and lower); *pungent* teas, and teas with a *high fired* flavour, appear to meet with *least* favour; *tippy* teas, too are to be avoided. *Dark liquoring* teas are needed, because, although Russians drink their tea light in colour, this is effected by filling up a small quantity of strong extract with a large quantity of hot water from the Samovar. Everything appears at present to be favourable to the introduction of Indian and Ceylon teas. The duty of course, is high, about 1s 9d per pound; but the Government, while augmenting the duties on all other imports, has left *tea* alone. The exchange is favourable to importation and the gold premium (duty being paid in gold) is also comparatively favourable to importation. The Russians, both high class and low class, are, more or less *connoisseurs* of tea and their method of drinking it (without the addition of milk) is most in favour of teas possessing some pretentions to *quality*. The overland trade appears to be much on the wane, so that the prejudices of Russians against ocean-borne teas is being rapidly dissipated. The Government is, moreover, giving great encouragement to the importation of tea by way of Odessa, with the view of providing a return freight for the subventioned line of steamers (the Volunteer Cruiser Fleet) trading between that port and Vladivostock—the eastern outlet of Siberia and the Russian Central Asian possessions. These vessels, moreover, pass Colombo, and moderate inducement would no doubt lead to their touching also at Calcutta, or other Indian ports.

I leave the subject here, as this letter is already too long, but with your permission I may venture again next week to return to it, and make some further suggestions.—I am, &c.,

GEO. SETON.

14, St. Mary Axe, E. C.,

London, Oct. 22nd, 1890.

*The mixed Malayo-Samese people, commonly known as Samsams, form the bulk of the population in the lower parts of Ligor and Sengora and in the north of Kedah. Although entirely assimilated to the Siamese in speech, customs and religiou these Samsams appear to be allied physically much more to the Malay than to the Tai stock. Yet their national sympathies seem to be altogether with the dominant race, and the people, especially of Ligor, have during the present century zealously co-operated with the Siamese in their persistent efforts to subdue the Malays of the neighbouring States.—*Encyclopædia Brittannica*—Article "Malay Peninsula."

THE CUSTOMS' REPORT ON THE TEA TRADE.

The annual report of the Commissioners of H M. Customs for the financial year, ending March 31st last will be interesting reading to those who are interested in the growth and development of the tea trade of India and Ceylon. From this report it appears that the gross amount of duty received upon tea was £4,490,695, a decrease of £139,621 upon that received in 1888-89. Tho report says:—

It had been so generally anticipated in the first quarter of the present calendar year, which corresponds with the last quarter of the financial year 1889 90, that a reduction would be made in the tea duty, that merchants and dealers became very cautious in effecting their clearances for Home consumption. The effect of this caution has been very apparent on the yield of this head of duty, and the decrease shown is more than accounted for by the difference in the amount of tea cleared in the quarter ended March 31st, 1890, as compared with the same quarter of the preceding year. This difference amounts to 6,000,000 lbs., equal to £150,000 in yield of duty. It thus appears that had it not been for the surplus of revenue which it was evident before the close of the financial year 1889-90 would be at the disposal of the Chancellor of the Exchequer, and upon which the anticipation referred to was founded, the receipt from the tea duty in 1889-90 would probably have only exceeded the actual receipt of 1888-89 by rather more than £10,000. This result cannot be said to be satisfactory from a revenue point of view, especially having regard to the importance of the tea duty as one of the principal sources of receipt, on account of the Revenue, under our charge. It is no doubt, however, to be traced to the displacement of Chinese by Indian and Ceylon teas, to which we have in recent years called the attention of your lordships in our annual reports, which has continued in an increased degree in the year 1889. It is not possible to trace with *absolute* accuracy the rate at which consumption of the various kinds of tea has proceeded in this country, because the official accounts have not hitherto been kept with a view of affording information on this point, but the following table shows the proportion contributed by China, India, Ceylon, and other countries, respectively towards each 100 lb. of tea imported into this country during the last twenty-five years. It must be borne in mind in examining this table as bearing upon actual consumption, that Chinese tea imported into this country is to a large extent exported again, whilst the bulk of the Indian tea imported is consumed in the United Kingdom.

OF EACH 100 LB. IMPORTED.

	China contributed. Per cent.	India contributed. Per cent.	Ceylon contributed. Per cent.	Other countries contribute Per cent.
1864...	92·55	2·34	...	4 61
1865...	93	2·50	...	4·50
1866...	93·74	3·88	...	2·38
1867...	91·81	6 07	...	2·12
1868...	91·77	5·89	...	2·34
1869...	90·86	8·07	...	1 08
1870 ..	89·06	9·17	...	1·77
1871...	88·25	8·91	...	1·84
1872...	86·80	8·89	...	4·31
1873...	83·81	11·28	...	4 91
1874...	81·98	10·12	0·30	6·90
1875...	86 31	12 87	0·08	0·74
1876...	84·03	14 99	o·05	0 93
1877...	82 65	16·50	...	0·85
1878...	80·88	17·29	...	1·83
1879...	76·94	20·76	0·07	2·23
1880...	76·43	21·81	0·08	1·68
1881...	77·33	21·66	0·08	0 93
1882...	72·83	25·43	0·24	1·45
1883...	70.27	26·66	0·90	2·17
1884...	67·22	29·55	1·03	2·20
1885...	65·84	30·35	2·00	1·81
1886...	62·99	31·85	3·10	2·06
1887...	54·00	38·15	5·89	1·96
1888...	47·43	40·34	10·10	2·10
1889...	39·88	42·93	14·70	2·49

The year 1864, with which the preceding table commences was the last year of the old rate of duty of 1s per lb., and in that year the total importation of tea was 124,359,243 lb. In 1865 the duty was reduced to 6 per lb., and in 1866 the total importation of tea rose to 139,610,044 lb. In this increased importation India fully maintained her position. The importation from that dependency rising from 3,534,509 lb. in 1864 to 5,413,583 lb. in 1866, has continued to progress with rapid strides until, in the year 1889, she contributed nearly 43 per cent of the total importation of tea into this country. But the growth of the culture of tea in Ceylon has progressed in a manner even still more remarkable. It is only within the last ten years that this culture has been carried on to an extent appreciable in the export trade of the colony, and it was not until as recently as 1884 that she contributed 1 per cent of the tea importation into the United Kingdom. In that year the contribution of Ceylon amounted to 2,210,983 lb. and it has since mounted up year by year by "leaps and bounds" as shown by the accompanying details:—

		lb.
1885	...	4,242,244
1886	...	7,144,313
1887	...	13.062,040
1888	...	22,509,564
1889	...	32,673,294

We may also point out that this advance both in Indian and Ceylon teas has been arrived at in face of the fact that the average price of these teas is considerably higher than the average price of Chinese teas. In 1889 the great bulk of the tea imported from China was Congou at an average price of 7½d per lb., whilst Indian tea averaged 10½d and Ceylon 11d per lb. Whilst, however, the displacement of Chinese by Indian and Ceylon teas has acted injuriously upon the Revenue, owing to the greater strength inherent in those grown in the latter countries, it would be incorrect to assume that tea beverage is decreasing in popular favour. The following figures show the consumption per head of tea leaf by the population for each of the last ten years:—

1880	...	4·57	1885	...	5·02
1881	...	4·58	1886	...	4·87
1882	...	4·67	1887	...	4·95
1883	...	4·80	1888	...	4 95
1884	...	4·87	1889	...	4·91

The figures for the calendar year year 1889, which were not disturbed by anticipation of the Budget to which reference has been already made, appear to indicate a fall in consumption of leaf, and to bear out our anticipations on the subject last year; but inasmuch as it requires a smaller amount of Indian or Ceylon tea-leaf than of China leaf to produce a given measure of tea beverage, and as the demand for Indian and Ceylon leaf is increasing, there is no reason to suppose that less tea beverage is, or it likely to be consumed.

BOGUS TEA.

The Commissioners of Customs have often had their attention called to the sale of tea at prices so low that it is manifest that the tea could not legitimately have passed through the hands of their officers; and in tracing out the history of such tea it has been ascertained, on fairly trustworthy evidence, that it has been obtained from the sweepings of warehouses, and sifted on the premises of the remover. This sifting is a somewhat laborious work, but, nevertheless, it is done by very cheap labour, and the sale of the tea, though at a very low price, yields a fair profit. So far as the Customs regulations go, no such tea in any quantity ought to leave the warehouse, because all spilt or damaged tea discernible is collected and thrown into what is called "the damage hole," for destruction. It is, however, necessary for the merchants and warehouse-keepers to clear the warehouses of wood, paper, nails, lead, and other refuse, and this is done by sale to carting contractors. In moving this refuse it is difficult, if not impossible, to prevent a quantity of tea from being taken up at the same time; and, in spite of all the care which the Customs officers may exercise, there is no doubt that a considerable quantity of tea in the course of the year does so leave the warehouse, and, of course, leaves without any duty being paid. In one or two cases where it was found that this tea was being largely trafficked in, the Board of Customs directed its seizure, and expressed a desire that the person sifting and selling it might be prosecuted; but, on the whole, it was thought

that, although the tea could not be said manifestly to have paid duty, yet that as it had not been removed furtively, and to a certain extent had even been taken with the consent of the Customs officers, it might be difficult to contend that it constituted "uncustomed goods," or that selling the tea could be sustained so as "a dealing with uncustomed goods," so as to involve a penalty. At the same time, it was manifestly injurious to the revenue that such a practice should be allowed to continue; and, also, there was no moral reason for it, because the removing contractor pays only for refuse and is not supposed to convert any of that refuse into an article by the sale of which in the market he would presumably displace an equivalent amount of the same article which would otherwise pay duty. It has consequently been enacted by the recent Act, that when any goods of a kind or description liable to a duty of Customs have been taken from a warehouse either with or without the permission of an officer of Customs, as unfit for consumption by reason of the mixture therewith of any other matter, the separation of such goods shall be deemed to be dealing with them with intent to defraud Her Majesty, and shall involve penalties accordingly.—*H. & C. Mail.*

PATENT LEGISLATION FOR A CENTURY.

The present century has been the time, and the United States the place, in which invention has made its greatest strides.

The growth of the patent system in the century which has elapsed since the first patent law was passed in 1790 has been enormous. Only three patents were granted the first year, and only fifty-five were granted under it before its repeal in 1793. The whole number of patents granted before 1800 was 256, a little more than one-half the number now issued weekly. The number issued in the last ten years from 1880 to 1890 was 195,454, or more than 800 times the number issued during the first ten years of the patent law. During the forty-six years prior to the passage of the act of 1836 the number of patents granted, exclusive of reissues, was 9,957, a number now exceeded in a period of six months. The number of patents issued by the office in 1836, after the date of the act establishing it, was 109, and the number for the fully year 1837 was 436. The whole number of patents issued in 1889 was 24,083. The whole number of patents granted since 1836 was 431,541. According to Mr. Smith's calculation, in fifty-four years the number of patents increased more than fifty-five fold, the receipts more than forty fold, the expenses more than thirty-two fold and the number of persons employed seventy fold. This increase has been truly wonderful. It speaks volumes for the growth of invention and the application of science to industry in the last century, and more particularly in the last half century.—*Bradstreet's*, Oct. 25th.

COTTON AND TEA.

We notice that some of our contemporaries have a length sounded the note of alarm respecting the inevitable effect that the recent rise in exchange will have upon many of the tea gardens. It must be manifest to the merest tyro that should the rupee rise to par or even remain at its present value those gardens that have kept afloat simply by selling in London to obtain the benefit of the exchange, must close, for it is not to be expected that either banks or agency houses will continue to advance funds to bolster up concerns whose prospects are hopeless. Such companies who possess flat or undulating land, not liable to wash, with good soil, favourable site with regard to communications and a superior *jat* of plants will no doubt, continue to hold their own, but a glance at the dividend list is sufficient to shew that most of the older gardens, especially those planted on steep sandy *teelahs* are doomed, and in fact several are now in liquidation, while others, unless they can raise money for opening fresh planting on favorable sites, must in due course follow suit; but as we have written above, the probability of such concerns being able to obtain pecuniary assistance is highly problematical. When the falling off in yield and quality is due to exhaustion of the soil and they *lay* of the plantation is moderately flat, we would reiterate the advice given some seventeen years back, viz. to dig well into the root finely pulverised lime stone, at the same time making either trenches of renovating pits between the rows of plants, which should be filled with bheel soil, if available, mixed with vegetable refuse and also a due proportion of lime stone. But best of all the coolies should be induced to stall their cattle for the night in one or more sheds, down the centre of which a drain should be carried so as to secure the urine in a tub, tank or other reservoir, and this, added to the other matters we have enumerated, well worked into a compost would go far towards stimulating the flagging vitality of the exhausted plants. Annually cutting back a certain area until the whole plantation has been thus treated, adopted in conjunction with high manuring, has proved beneficial, though, of course, diminished return would have to be submitted to until the cut back portion had re-grown sufficiently to bear plucking. All this, of course, means the raising of fresh capital and, probably, many shareholders would demur to what they, no doubt, would consider as throwing good money after bad, but unless they make up their minds to adopt some method of endeavouring to retrieve matters—and we venture on one or two suggestions—the alternative is bankruptcy, for that in the case of tea properties under the present out-look, is the true interpretation of the more euphonious term liquidation. Upon those plantations were the plant is exhausted but the soil still retains a moderate amount of vigor, we would recommend the cutting back of the entire planting and the sowing between the rows in well manured pits, which could be easily and rapidly excavated by means of small sludges such as are used in ascertaining the character of the soil in river beds, with the best cotton seed available; for if it pays to grow cotton in the southern states of the U. S. A. with wages equivalent to R24 per month, it would surely do so in Cachar, at less than half that rate. Of course, some arrangement would have to be come to with the steamer companies for conveying the bales to a sea port at a reasonable rate, or if the companies declined to entertain any proposition for reduction in freight it would be necessary to raise funds for the purchase and equipment of one or more steamers and flats, on the co-operative principle. It is no use people arguing that cotton will not pay, as every cold weather an enterprising foreign firm locates its employés with gins and presses at Goalpara in Assam, purchasing cotton from the Garrows with highly profitable results.

It must be recollected that the difference in price between cotton and tea is, under the present state of the tea market, not so very great and, when it is considered that cotton needs but packing in gunny (costing but some 6 annas per bale) and that tea requires lead-lined chests, solder clamps, etc., the difference in laying down the two commodities is reduced to a minimum. Reverting to the question of cultivation it must be borne in mind that tea gives no appreciable yield till its fourth year, while cotton, being an annual, furnishes returns in nine months; though among the hill tribes who know nothing of manuring the *jhooms*, cultivated by them, are abandoned after three years—the soil being by that time considered exhausted. Were the system of cultivation adopted in the cotton states, followed out in Cachar, Sylhet and Assam, the same fields would turn out steady even crops for twenty years and even should signs of deterioration become apparent, most of the non-paying tea concerns have sufficiently large tracts of forest to fall back upon, so that no anxiety on the score of want of area need be entertained.—*Indian Agriculturist*, Oct. 25th.

A RUSSIAN BUYER OF CHINA TEAS AND THE PROSPECTS OF CEYLON TEA IN RUSSIA.

I have had some talk with a Russian buyer of Ceylon teas, who is also taking a trip home in the "Irawaddy." His knowledge of English is unfortunately some-what limited, and his French, like that of most Englishmen, is also rather "rusty," but I learnt that he had had three or four years' experience as a tea buyer in Hankow and Foochow, and he was herefore likely to be able to express an opinion about the China tea market, and the prospects of Ceylon tea in Russia. Perhaps his ideas are a little biassed, but it is well to hear both sides. While the exports of China tea to Great Britain have diminished so tremendously, and the quantity of tea sent down from the gardens had considerably decreased, he did not appear to think that there was an appreciable falling-off in the quantity sent to Russia, but if I understood him correctly he thought that in ten years English buyers would entirely give up buying China teas and would buy only from Ceylon and India. Many of the China growers, he said, are now rooting out their tea, and planting potatoes instead. But he does not think that the Russians will take kindly to Ceylon teas for several years, as our teas have not that peculiar aroma to which they are accustomed in the China teas, and of which they are so fond. We tried a few cups of Ceylon tea on board one afternoon, and he thought it was decidedly strong—too strong for the Russian taste. But that may have been the fault of tea we tried, or the fault of the brewing.

A. T. B.

RUBBER IN BRAZIL.

PARA.—Messrs. Singlehurst, Brocklehurst & Co. write under date of the 5th inst.:—RUBBER.—Since our last advices has been almost constantly in active and general demand, causing our market to assume a most animated and strong position, in harmony with the stimulating features, which, in consequence of greatly reduced stocks, prevail for the time being at the American and European consuming centres. Buyers meeting the market liberally, all arrivals were immediately taken up by them, and frequently bespoken before the rubber had made its appearance, with the result that prices have advanced to 3$300 per kilo. for fine and 2$300 for coarse Islands rubber, while last sales of Up-river have been made at 3$500—2$500 for fine and coarse respectively. As there are no stocks available and arrivals have been small during the past few days prices are well maintained. Just now, however, buyers seem to have satisfied their immediate wants, and may resume larger operations on less spirited lines. An interesting census has been recently taken in the Purús river district, one of the most important regions for the extraction of rubber, which reveals a shocking result. Basing the estimate on the number of immigrants, chiefly from the neighbouring states who have gone to that district during recent years, it appears to have been considered that its population consisted of rather more than 40,000 souls. It has, however, been reported, on what is said to be reliable authority, that the number existing—including children—is only 16,000 souls. The mortality always considerable, and the most lamentable feature in connection with the production of rubber, is described as having been stupendous last year, especially on the Acre river, where the banks are plentifully sprinkled with crosses, marking the ravages of fever and disease. If this has been the fate of native immigration, what may be expected for Europeans should they ever venture to these parts?—*Rio News.*

SCHOOL OF AGRICULTURE, COLOMBO:

PRIZE DAY.

Yesterday (Nov. 29th) afternoon took place another of those pleasant gatherings which recur annually at the School of Agriculture in the Cinnamon Gardens. The entrance to the building was tastefully decorated and the school-room had much artistic labour bestowed on its decorations. The Hon. the Colonial Secretary presided, and amongst others present were the Hon. J. J. Grinlinton, Hon. W. W. Mitchell, Hon. Dr. Anthonisz, Hon. M. C. Abdul Rahiman, Messrs. H. W. Green, J. B. Cull, T. E. De Sampayo, Mrs. and the Misses Keith, Mr. James De Saram, Dr. H. M. Fernando, the Maha Mudaliyar, Mr. C. Dreberg, Mr. and Mrs. Joseph, Messrs. C. Thomasz Walter Pereira, R. P. Jayawardena, Mrs. and the Misses Beven, Mr. and Mrs. Schrader, Mr. C. M. Fernando, Mr. and Mrs. Jeronis Peiris, Advocate Senathi Rajah, Miss Frédoux, Mr. Ranesinghe, Mr. J. S. Drieberg, Mrs. and the Misses Attygalle, Miss Lindsay, Miss Drieberg, Mrs. and the Misses Grenier, Mrs. C. Drieberg, Rev. S. Lindsay, Mrs. A. de Saram, Dr. and Mrs. Asreappa, Mr. and Mrs. F. Dornhorst, Rev. T. C. Hillard, Dr. Bowles Daly, &c.

The proceedings commenced by the President calling upon the Principal (Mr. C. DRIEBERG, B.A.) to read his Report.

Report was of a very encouraging nature, and its reading was punctuated with frequent marks of applause from the audience. It alluded in terms of praise to the late Governor Sir Arthur Gordon, who had by his encouragement and patronage in previous years shown his interest in the work, of the School. His Excellency Sir Arthur Havelock was prevented from presiding owing to pressure of work, but be had already shown his appreciation of the work carried on in the School by visiting it. The presence of Sir Edward Walker was an indication of the interest he evinced on behalf of the school. The report next proceeded to state the results of the operations carried on in the various provinces by the students who had been sent forth from the School. One of their men had been appointed as an agricultural instructor in the fever-stricken district of Walapane—the condition of which district the energetic Assistant Government Agent of Nuwara Eliya was endeavouring to ameliorate. That appointment made up a total of twelve students who had been employed as agricultural instructors—seven of whom were paid by Government and five privately. It was a matter for congratulation that the Government officials rendered valuable assistance to the cause of agriculture, notably the Government Agent of the Eastern Province, the Government Agent of the Sabaragamuwa Province, and the Assistant Government Agents of Matara and Kegalla. Another batch of students was leaving College on completion of their studies to engage in agricultural pursuits. It included some excellent young men, among whom was Mr. J. J. Koddipilly, who has had a brilliant career at the School. One feature of interest was the publication of a Monthly Magazine devoted to the interests of Agriculture; and this literary effort is appreciated by those for whom it was was intended. The School Museum is growing in size, the Agricultural Discussion Society is well supported by both students and outsiders. A dairy has also been set on foot by the headmaster, Mr. Jayawardena, and experiments have so far been attended with success, and it is satisfactory to note that a long felt want has been supplied. Through the knowledge imparted in this branch of agriculture the students could gain a knowledge of the proper housing, feeding, and general treatment of cattle in health and disease. Another feature of interest in the report was the fact that a large variety of crops had been grown on the School grounds with the view of demonstrating the most approved methods. The report next referred to the willing help and ready assistance of Mr. De Silva, the second assistant, not only by teaching in the School but by his writings. Another student of last year's batch has been employed as a conductor on an up-country estate; and it was satisfactory for the Principal

to note that the advantages of employing such men consisted not merely in having an intelligent manager but also a disciplined and honest employee. The report concluded by speaking of the loss of their old Director, Mr. Green, to whom the School owed its existence and success, but they had also to welcome the presence of Mr. Cull, whose established reputation as an educationalist insured the successful direction of the Department of Public Instruction.

Mr. J. B. CULL, M. A., the new Director of Public Instruction, then rose and said:—Sir Edward Walker, Mr. Principal and ladies and gentlemen,—I congratulate myself in the fact that my predecessor, Mr. Green, has come amongst us this evening prepared with a speech. The School is pre-eminently a poem of his own composition; and the fact that I am so completely new to the use of the plough makes it impossible for me to comment on the nature or the results of the School in any way as adequately as I would wish. I congratulate you, Mr. Principal, on the record you have been able to present for the year. I learn that that there are 26 students on the roll, and the report of those students who have been sent forth to work in the various districts is entirely satisfactory. (Applause.) I leave it to my predecessor to comment upon the various modes of agriculture that are carried on in the island with unvarying success in the various provinces. As regards the School itself I note with great pleasure that it embodies one of the most noble feelings, and, what is best, it teaches the dignity of labour. (Applause.) Passing the compound the other day I was struck by seeing the boys engaged in mammottying and other kinds of operations, and in a country like this, such kind of work is eminently satisfactory. It has been wisely remarked that a man who makes a blade of grass to grow in a place where there was no grass at all is a benefactor to the country, and this is the great object of the Agricultural School—multiplication of the fruits of the earth; making nature yield more abundantly and tending to eliminate as far as human agency can eliminate the ill-effects arising from untoward climatic conditions in the island. (Applause.) Reading in connection with this subject a poem written many centuries ago, entitled, "Georgis de Virgil," I was struck with the rule laid down regarding ploughing in which the author recommends that as a preparation for ploughing one should take his coat off, and put his shoulder to the plough, and it is universally true that a man who cannot take his coat off and put his backbone into his plough is a very incomplete agriculturist. (Applause.) I will not occupy your time any longer in view of the speeches which are to follow, save to express my great gratification at being present here this evening and to express the interest I have always taken on behalf of the School of Agriculture. (Loud applause.)

Mr. H. W. GREEN next rose, and said that the students of the Agricultural School, unlike other ordinary educational establishments, were limited to a certain number. They had a great many applications for boys, but their number was limited to 23 in his time and now he saw it was 26. They only wanted a select number of boys, who had the interests of agriculture at heart. He read in the newspapers that one of the boys had been sent from the School to the clerical examination, but he hoped that the Principal would never allow this to occur again, for the one object with which the boys entered the School of Agriculture was to qualify themselves in agricultural knowledge and to go forth and spread forth that knowledge. When he first thought of an Agricultural School, he had many discouragements to contend with, but he was now glad to find that he had successfully broken the ice. There were eleven agricultural instructors, seven of whom were paid by Government and five private'y, so that all their old students were not simply employed under Government. The improved plough had done a great deal to foster agriculture, and from the reports to hand, he found that the crops had more than doubled their usual yield by the use of the plough. They had sent out their young men to work with the improved ploughs and they had all done good work. The other day he sent out a hard-working man to work in a place some 19 or 20 miles from Trincomalee. The people there were not inclined to work at first, but the speaker himself spoke to the people and told them that if they did work they could share the profits equally and so ward off starvation. At last they did set to work and they got a good return and shared the profits. He moved the instructor on to the next station, and the result was so eminently gratifying that here were several applications for the ploughs. Their object was to disseminate a knowledge of agriculture so that others might follow the example; for he found the Sinhalese people always ready to take advantage of opportunities offered to them. They wanted the young men to work. A good many had already taken advantage of employment on estates, and he was quite sure that the education received here would not be thrown away in vain. In conclusion he wished all success to the institution and wished the pupils good-bye. (Applause.)

The distribution of awards then took place accorde ing to the following list, each recipient as he came up to receive his gift being heartily cheered by hi comrades:—

SENIORS.—Agriculture, Chemistry, Botany, Zoology, Entomology, English, History and Geography, Mathematics, and Practical Chemistry (the late Mr. de Soysa's prize) all gained by J. A. Kodippily; Veterinary Science was won by A. Drieberg; and Practical Agriculture by J. P. Ranasinghe.

JUNIORS.—Agriculture and Geology by P. V. Cooray, and Chemistry, Botany, English, History and Geography, Mathematics, and Field Surveying (the Grenier prize) all by E. M. Johannes.

THE PRESIDENT'S SPEECH.

The prize-giving over, Sir E. WALKER said:—Mr. Principal and ladies and gentlemen:—It gives me great pleasure to come here today and to make the acquaintance of the School of Agriculture and to join with you by your presence in the expression of encouragement to the masters who have been engaged in teaching the boys during the past year and congratulating the boys themselves on their course of study. (Applause.) I trust that those who have received prizes today will find in them an encouragement to persevere in after life and to exercise that industry which have enabled them to attain certificates. I am not altogether a stranger to the School of Agriculture. The deservedly high terms in which Mr. Green has spoken of the institution I am well aware of, as it has been my good fortune to have been much associated with Mr. Green, and from him I have from time to time heard a great deal of the School and have been much impressed with the zeal and the interest he has taken in it. (Applause.) I think the Principal in his Report has very rightly expressed regret at his loss, but it is not a very real loss after all, for you have in his successor a gentleman who has the interests of practical education at heart. and I feel sure that he would use his best efforts in furthering the work of agriculture. (Applause) And you have Mr. Green in a position to help you at the Governor's elbow and as my principal colleague and assistant. As regards the work of the School I have heard of several accounts disparaging and discouraging the work and utility of the education given in this institution. Of course it would be difficult by statistics to show how valuable the School was, but I am of opinion from all the information I have gathered, that those boys who have been sent forth from this School into the various provinces of the island are doing good work in agriculture. (Applause.) I put the question to Mr. Drieberg when I came into the room whether during his travels about the country he had seen good work being carried on in agriculture as the result of the money spent on it, and he unhesitatingly answered in the affirmative, and I think we may take his opinion as one of considerable value. His opinion is, moreover, of an independent character, because he belongs to this country and it is not as if he were speaking of the results of his own labours, but of those who have gone before him. Some people have tried to

throw cold water over the school: but if the boys only worked quietly and persistently their labours would bear much fruit. (Applause.) The Principal has referred to a pupil who had gone to the district of Walapane. Well I know of no one who is likely to do more good to that unfortunate part of the district than one who would instil into the poor people there some knowledge of agriculture, and if he did that he would certainly accomplish more than what Government officials and Colonial Secretaries had yet been able to achieve. In conclusion I have only to express the great pleasure it has given me today in taking part in the prize-giving this year. (Loud applause.)

The Hon. Mr. J. J. GRINLINTON followed, and in the course of a spirited address urged on the School the desirability of experimenting upon the system of transplanting paddy. In some parts of the country this system was a success, while in other parts it was a failure, chiefly because in many cases transplanting took place at the wrong time and the plants died. He hoped that the matter would occupy the attention of the Principal and his pupils, for transplanting was carried on on an extensive scale with various other products, and he saw no reason why they should not carry out experiments in transplanting paddy. With regard to the remarks which fell from the President and Mr. Green that cold water was being thrown on what they did by some people, he believed that these people were everywhere in the world, and the very men who had not lifted a finger to help them and had done all they could to discourage them would whenever they heard that success did attend their efforts, say "We told you so." (Laughter and applause.) He counselled the young men not to trouble themselves about the criticisms levelled against them, but simply to work on steadily and success would assuredly follow. He was sorry to find that the Sinhalese nation were not giving that attention to cultivation which they did in the ancient days. In those days their one ambition was to possess and cultivate the land, but now the majority of the young men only tried to get educated and seek employment under Government on the smallest pittance. This, the speaker said, was what ought to be discouraged; and he thought the best thing for our young men to do was to put their shoulders to the plough and to give their attention to agriculture. (Applause). In addition to agricultural knowledge a knowledge in mercantile matters was also indispensable. He would instance the case of those gentlemen in England who were trained to agricultural pursuits in preference to a berth under Government, and he maintained that if the young men only considered the advantages to be gained from a knowledge of agriculture, they were bound to succeed in life. In conclusion the speaker proceeded to advocate technical training. The School was only in its infancy and they had heard of the success which had attended their efforts; and if success had attended efforts where difficulties had to be surmounted before, he had no doubt that a school for technical education would also meet with success. (Applause.) Without technical education the School could not prosper, and he would be very glad if technical education was brought to the very doors of the natives. (Loud applause.)

Mr. H. W. GREEN referring to Mr. Grinlinton's remarks regarding the system of transplanting said that that was the first thing he started with, as it was the system which brought out the best returns. In China and Japan this system of transplanting brought enormous folds, and even transplanting in the sandy soil at the back of the room resulted in a yield of 539-fold. Another great advantage in favour of transplanting was that 10 measures sufficed to plant out an acre of land whereas the people usually used two or two and a half or three bushels an acre. The system too could also be carried by means of a nursery in one corner of the field, and during a period of drought the cultivator would be able to water this small piece of ground from his chatty and thereby to tide over the period of drought without being starved (Applause).

The PRESIDENT said that in bringing the proceedings to a close he wished all the pupils a successful career. He might mention that in connection with the eleven students who had left the institution for the various provinces, the fact that five had been employed by private parties indicated that they had shown an independent appreciation of the worth of the School. (Applause.)

Three ahearty cheers having been given to Sir E. Noel Wlker for presiding on the occasion, followede by rounds of cheering for the Principal and the visitors the gathering adjourned to the green, where litht refreshments were partaken of: the Band of the C. L. I. V. treating the people to some excellent music.

A GIGANTIC AFRICAN COMPANY.—We believe (says Saturday's Liverpool *Journal of Commerce*) it is intended to float a very large company for the purpose of developing the resources of West Africa. The capital is to be placed at ten millions sterling, and amongst the likely promoters are the Duke of Westminster and Mr. Stanley.—*A. F. Press.*

HOW TO SELECT BANANAS.—A fruit-buyer said to me the other day—"Very few buyers know how to select bananas when purchasing them by the bunch. It's a very simple thing. Look at the thick end of the branch on which the bananas hang. If it is green the bananas will ripen slowly and lusciously and will be of good flavor. If the end of the branch is black the bananas themselves will blacken after a day or two and will ripen too fast and rot. Even if they are plucked the day after they are bought, and eaten, they will be mushy and the flavor will not be good."—*Jamaica Gleaner.*

BUG ON COFFEE.—Mr. Jas. D. Watson will not find Ceylon planters to agree with him in making light of green bug. He write as follows to a Rangoon paper:—

The coffee pests are only two in number and they are termed in plain language—"Black Bug" and "Green Bug." But they have never been looked upon as great enemies to the coffee trees, and planters know well that wet seasons had to do with their production more than anything else. But I have never found a good handful of quicklime, thrown on the trees early in the morning, to fail, and the bug left the trees as they came. Of course, the quicklime or "*caustic lime*" must be applied when the dew is on the trees, and this could always be carried on up to 8 a.m., and 300 or 400 coolies get over a good acreage in the course of that time.

KIFDERED SARKASTIC.—The *Fouchow Echo*, referring to the poisoning of a tea party in England, the poisoning being traced to corrosive deposits in the urn, says:—"Worse and worse. We never did think well of Indian tea, but little did we suspect that there was actually poison in the cup. Here is a case where, owing to the accumulated deposits in the urn used for the purpose of making the tea, one hundred persons were poisoned by it! It is too shocking. That the tea used by the benevolent lady could not have been of China growth is amply proved by the fact that the Chinese never clean out their teapots, be they metal or earthenware, for the reason that a long-used teapot, never cleaned, is known by experience to add sweetness to the brew. Such a misfortune as the above would never have occurred had China tea been used. Its purity is a guarantee against such mishaps. Any deposit left is well known to be perfectly free from deleterious matter. No doubt the benevolent Miss White and the British public at large will run away with the idea that the deposits of all tea are poisonous. Poor China! it is a fresh case of the innocent suffering with the guilty."

INSECT AND OTHER PESTS: WHY THEY EXIST.

IMMUNITY OF TEA IN CEYLON FROM ENEMIES—POOR COFFEE—CURE FOR GREEN BUG—PUBLICATIONS OF THE AGRICULTURAL DEPARTMENT OF NEW SOUTH WALES—REMEDIES FOR NOXIOUS INSECTS—RUST ON WHEAT AND FRUIT TREES—LADYBIRDS AS ENEMIES TO BUGS—LOCAL APPLICATIONS.

NANUOYA, Nov. 27th.

In Miss Ormerod's works, in similar books published in America, in Dr. Maskel's book on scale insects in New Zealand, in a multitude of books of the same nature, and in the agricultural and horticultural papers and scientific reports which reach us from all parts of the world, but especially those from India, Australia and the United States, I have read carefully and noted information about insects injurious to cultivated plants and insecticides, including in the latter category insects which prey upon predaceous insects, such as "the ladybird"—

("Little fleas have lesser fleas to bite 'em");—

so much indeed as to cause me to consider the mystery of such pests in nature as phylloxera and bugs, helopeltis and red spider, and hemileia and red rust, as a mystery only second to the existence of snakes vested with venom. I suppose the mystery is to be solved only by reference to the moral revolution which called forth the declaration:—"Thorns and briers shall the earth bring forth, and in the sweat of thy face shalt thou eat bread." If there were no difficulties to encounter or overcome, men would either sink into the slough of indolence, or imitate the pride of him who said, "Behold great Babylon which I have built." At any rate, we have to fight the adverse circumstances of our natural surroundings, as well as to enjoy their favourable characteristics. As yet at least, we in Ceylon have reason to be thankful that our new staple production, tea, should enjoy so much of immunity from insect or fungoid enemies. But "the enemies of the coffee tree" seem bent on pursuing their victim to extinction. The latest and worst foe is "green bug"; and in answer to the demand for a remedy, I feel bound to repeat, as the outcome of my reading, experience and reflection, that applications should be used specially calculated to *smother* the insects to death. No doubt powerful chemical agents, especially poisons, have their use, but danger to human life as well as vegetable vitality is involved in their application, and it really seems a question whether they cannot be dispensed with. Is it not a fact that the value of a mixture of grease and sulphur as a cure for the itch-insect consists in the smothering effect of the grease and but little in the actively destructive power of the sulphur? I have just been reading with great interest some valuable publications issued by the newly created Agricultural Department of New South Wales, of which the Hon. Sydney Smith, M.P., is Minister, and Mr. H. C. L. Anderson, Director. Both have gone to work with great energy and intelligence to collect and diffuse information, summoning for this purpose the leading agriculturists and horticulturists of the colony to a conference, at which valuable papers were read and discussed, differing views and experiences compared and conclusions arrived at. Remedies for noxious insects received much attention, and I have been much struck with the simplicity as well as the alleged efficacy of some of the suggestions offered as the following out of experience obtained. One practical orchardist stated that he kept his orange and other trees clear of scale insects by an application of nothing more potent than diluted starch: diluted but of such a consistency as to form a crust over the insects and which remained over their bodies long enough to secure their death from suffocation. It would seem as if something more potent than starch or flour paste would be required to penetrate the body of the parent scale so as to reach the thousands of insects of several generations beneath, but the testimony was the starch sufficed, and, therefore, I advise a trial of rice flour, either alone or mixed with common gum (dammer?) or some viscid substance, the mixture to be sprayed or diffused by coir brushes or brooms, on to coffee bushes, and orange or other trees affected by bug, brown or green. In the case of coffee bushes, when not in fruit of course such arsenical poisons as London purple and Paris green can be applied, with much more safety to human life at least, than would be the case with orange trees bearing fruit, edible vegetables or tea leaves. Another simple recommendation was the use, as an application, of a decoction of gum (eucalypt) leaves; and an orchardist asserted that he had kept his trees free of "scale," by mulching them with gum leaves, which, when decayed were dug into the ground at the roots of the tree with good fertilizing as well as bug-resisting effects. The Australian eucalypts, especially blue gums, are now so common in Ceylon, that a decoction of the leaves and the leaves themselves as a mulch, that is as a covering for the surface around coffee, orange or other trees, can easily be tried.* If by such simple means success is not attained, then the more potent remedies (generally poisons) can be resorted to. A large proportion of such remedies were discussed at the Sydney Conference, in the light of local and general experience in Australia, as well as the large experience obtained and the comprehensive information collected in the United States, especially in Florida and California. The Codling Moth (*Carpocapsa pomonella*) so destructive to apples and pears especially formed the subject of the first elaborate paper published by the Department to which we have referred. Another apple pest, *Cacœcia postvittana*, was also noticed, the larvæ of which have been found on several native plants, including *Grevillea robusta*. Birds, lizards and frogs are enemies of these moths, and with trap bands of canvas, the spraying of Paris green or London purple is recommended, in the proportion of 1 lb. of the poison to 100 gallons of water. The application of the arsenical solution is, of course, made when the fruits are quite small. What applies to apple trees applies to coffee, only that it is the leaves and twigs of the latter which are chiefly attacked. In a paper on rust in wheat, it is stated that last year the loss of farmers in Australia from this pest, so like *Hemileia vastatrix* in general appearance, was equal to £2,500,000 sterling. No such cereal as rust-proof wheat has been discovered, but some kinds are constitutionally able to resist the pest, and it was recommended that wheat should follow other crops, such as maize, sorghum, &c. Of course no such remedies apply to plants perennially in the soil. For peach rust, the washing of the trees with ferrous sulphate (green vitriol or copperas,) 1 lb. to 4 gallons water is recommended; also the dressing of the *soil* with the same substance, ½ lb. for a tree, finely powdered, or dissolved in 2 gallons water. This poison can be applied to coffee trees,—with caution, of course. For the maize moth and the cotton worm, *pyrethrum*

* It is quite possible that a decoction of our coarse hill lemon grass, mana, might be efficacious as well as a mulching of the grass. In the old days of black bug, I remember wisps of mana grass being tied on the coffee stems.

extract, diluted in water, one to thirty, was found somewhat useful. A paper on microscopic nematode worms (Tylenchus and root gall) is perfectly appalling. The remedies for this pest are also good remedies for other plant diseases,—lime, and muriates and sulphates of potash and ammonium. In California, the threatened destruction of the orchards by the cottony cushion scale (*Icerya Purchasi*) the worst of all the bug tribe, was averted by the importation from Australia and the breeding and spread of "ladybirds" (*Vedalia cardinalis*). This scale-feeding insect might be tried as a remedy for green bug on coffee? There is a native "ladybird," but we do not know if it is identical with the Australian species which the Californian orchardists have found so great a benefactor. The losses caused in the United States by insects which ravage crops have been reckoned at £60,000,000 to £80,000,000 per annum! No wonder, therefore, if much capital, science and experiment have been devoted to the study of the life habits of the insects and the best means of extirpating them and of lessening their ravages, where extirpation is impossible. From an able paper by Professor Olliff, the New South Wales entomologist, I extract some valuable and suggestive passages :—

When man came to till and to cultivate, many insects which naturally fed upon the plants he grew found abundance of food, and multiplied accordingly. It has thus come about that the cultivation in large areas of one particular kind of plant has resulted in an increase of particular pests. To illustrate my meaning it is only necessary to instance the Cottony Cushion Scale (*Icerya Purchasi*, Mask,) of the orange, and the Hessian Fly (*Cecidomyia destructor*, Say) of the wheat, species which have caused immense havoc in America and in South Africa, where they have found abundance of food brought together by the orchardist and farmer. Apart from this inevitable increase of native or indigenous species, many others have been imported with plants and cuttings, and also in the ordinary course of commerce, from one country to another; for it is well known that some of the most destructive insect pests of Australia have been introduced accidentally from Europe and America and similarly some English pests came from the East, and some American pests from Europe. In these matters, indeed, a fair exchange may be said to take place, for we are responsible for sending a very troublesome creature in the shape of the Cottony Cushion Scale (*Icerya Purchasi*, Mask.) to our American cousins and to our brother colonists in South Africa. If we take only a casual glance at the destruction which occurs every year to our crops we shall perceive that if these ravages could be brought under control, by lessening the number of the injurious kinds whenever they appear in excess, the benefit would exceed anything of which we have any conception.

Of the many substances and compounds used as insect destroyers, the following are the best known :—Lime, sulphur, soot, salt, wood-ashes, corrosive sublimate, naphtha, naphthaline, turpentine, alum, carbolic acid, phenyl, cyanide of potassium, green vitriol, ammonia, alkalies, benzine, vinegar, sulphuric acid, blue vitriol (sulphate of copper), hot water, &c. Most of these may be successfully used for specific purposes either dry, in liquid, or in vapour; but the three most useful insecticides of general application in use during the early days of economic entomology in America and up to within a few years, were undoubtedly tobacco, white hellebore, and soap. Tobacco water and tobacco smoke have long been employed against Aphides and other delicate insects, and are most useful. A quite recent advance in its use is by vaporising. The vapour of nicotine is most effectual in destroying insects wherever it can be confined, as in greenhouses. Thus the boiling of tobacco in such a greenhouse is as effectual as and less injurious to the plants than the older methods of syringing or of fumigation by burning. The vapour gradually arising from tobacco stems strewn on the ground and regularly moistened is likewise effectual.

White hellebore, either in dry or in liquid, has long been one of the most satisfactory insecticides against Saw-fly larvæ, otherwise known as false caterpillars; while syringing with soap-suds will kill some soft-bodied plant-destroyers, and when used as a paint on the trunks of trees is an excellent repellent against the parents of different borers.

More important, however, than any of these insecticides are the three now most commonly used. They are—(1) arsenical compounds, (2) petroleum, and (3) pyrethrum. The first act through the stomach, and are effectual chiefly against mandibular insects, *i. e.*, those insects with biting mouths; the second and third act by contact, and are therefore of more general application, affecting both those insects with mandibular or biting mouths and those with sucking or haustellate mouths.

The use of arsenic as an insecticide in the field dates from the year 1871. At the rate of 50 grains of arseniate of soda and 200 grains of dextrine dissolved in a gallon of water and this diluted at the rate of about an ounce to ten gallons of water, it furnishes one of the cheapest of insecticides at command, and various patented combinations of it have been extensively sold and used. Again, one pound of arsenic and one pound of sal-soda boiled in one gallon of water till the arsenic is dissolved, and diluted at the rate of one quart to forty gallons of water is also a good formula. The chief merits of arsenic are cheapness and solubility. Its demerits are its white colour, which makes it liable to be mistaken for harmless substances of the same colour, and its tendency to burn the plant. Paris Green or Scheele's Green has been more extensively used than any other arsenical compound, and is, on the whole, one of the most satisfactory insecticides.

A refuse obtained in the manufacture of aniline dyes, and known as "London Purple," is the third important arsenical compound.

It is used with diluents, either wet or dry, in the same manner as Paris Green. For some insects experience has shown it to be less satisfactory than Paris Green; for many others it is equally effective, and has the great advantage over Paris Green of being cheaper; of covering twice the ground, weight for weight; of being more soluble, less poisonous, more adhesive, and permanent in its effects.

The following receipt is recommended by Dr. Riley for certain pests, and other applications will suggest themselves:—Forty gallons of water, $\frac{1}{4}$ to $\frac{3}{4}$ lb. of London Purple (or $\frac{1}{2}$ to 1 lb. of Paris Green), three quarts of flour, [N. B.] the solid ingredients intimately mixed with the water by washing them through a strainer, sprayed upon the trees by means of a force-pump and nozzle, was found to effectively destroy web-worm. The effect of the poison is sometimes not observable until after three or four days. Care must therefore be taken not to overdo the spraying.

Petroleum, in its various forms, has long been recognised as one of the most effective insecticides known, all oily substances being particularly deadly to insects. Unfortunately, they are also injurious to plants, and they can then therefore only be applied after the discovery of suitable methods of diluting them so as to kill the insects without injury to the plants. Refined kerosene has been used to a limited extent, by forcible attenuation in water and spray, while some plants withstand doses of the pure oil Of the various substances used in attempts to emulsify and mix kerosene with water, none are more satisfactory than soap and milk. An emulsion resembling butter can be produced in a few minutes by churning with a force-pump two parts of kerosene and one part of sour milk, or soap solution, in a pail; emulsions made with soap solutions being generally found to be the more effective. The liquids should be at about blood heat. This emulsion may be diluted with from nine to fifty parts of water which should be thoroughly mixed with one part of the emulsion.

The strength of the dilution must vary according to the nature of the insect to be dealt with, as well as to the nature of the plant; but, finely sprayed in twelve parts of the water to one of the emulsion it will kill most insects without injury to the plant. The spraying should be done by a force-pump through

cyclone nozzles; it is best done in the cool of the day, and where possible, in calm or cloudy weather; two or three sprayings at intervals of a few weeks being preferable to a single treatment.

The following is a good receipt:—Two parts of oil to one of soap solution or milk (the soap solution being made by dissolving from a quarter to one pound of common soap, or whale-oil soap, in one gallon of water). The whole is violently agitated, at a temperature of about 100° F., by driving it backwards and forwads through a spray nozzle. The emulsion thus formed is diluted with nine parts of water. Flour or resin soap-wash is sometimes added to the kerosene wash, to give it greater adhesiveness, [N.B.] and 4 or 6 ounces of arsenious acid (or half a pound of arsenic, half a pound of sal-soda, boiled in half a gallon of water till the arsenic is dissolved, or half a pound of London purple) is sometimes added to each 100 gallons of the wash, to render it more effective.

Pyrethrum roseum and *pyrethrum cinerariæfolium*, two plants, natives of Asia and Europe respectively, have long been known to possess insecticide properties, especially the powder from the dried and pulverised flowers. This powder can be used in liquid solution and its action on many larvæ is marvellous, the smallest quantity paralyzing and ultimately killing. As the insecticide property dwells in a volatile oil its influence in the open air is evanescent, in which respect it is far inferior to the arsenical products; but, being perfectly harmless to plants, it can frequently be used on vegetables where the more poisonous substances would be dangerous.

Of all insecticides to be used against root-feeding insects naphthaline, sulpho-carbonate of potassium, and bisulphate of carbon are the chief. It has recently been shown that napbthaline in crystal may be satisfactorily used under ground, destroying by slow evaporation. But bisulphide of carbon still holds the first place in France against *Phylloxera vastatrix*. Large quantities of the latter are now imported from England into Capo Colony for the purposo of treating the phylloxerated vineyards.

In the above extracts is summarized most of the information available regarding insecticides and their application. But as in Ceylon we have to deal at present specially with the green scale insect on coffee, I would repeat my recommendation for a trial of the simple remedy of rice flour mixed with water and gum or some viscid substance, applied of such a consistency that it may adhere to and kill the insects by asphyxiation. Essence of leaves of gums and mana grass might be added to the mixtures, or decoctions containing their acid and volatile oil properties might be sprayed on the bushes, after the adhesive matter has been on for some days, or at alternative intervals. For application the "straweonizer" promises to be useful, but a hand-pump with a nozzle will answer, or where the affected patches are limited, coir brushes might suffice. So much for the present, but I may recur to the subject.

INSECT AND FUNGOID PESTS AND THEIR REMEDIESS—HOW TO CONQUER GREEN BUG—BIRD ENEMIES—HARE—FLYING-FOXES—MONKEYS—RATS.

To revert to the N. S. Wales papere on insect and fungoid pests, it is stated that oïdium on vines can be fought with finely powdered sulphur, while a paper by a German scientist ie quoted, showing that the destruction of vines affected by *Phylloxera vastatrix* could be obviated by insertion amongst the vines of tubular poles, down which creosote wae poured into the earth, so reaching and klling the insects. A small midge-like fly which attacked vines, peaches and other fruit trees was destroyed (as was the foliage and fruit) by a solution of carbolic soap mixed with tobacco juice. Had a viscid preparation such as birdslime been applied, the fly might have been killed without the sacrifice of the leavee and fruit. Mr. Scobie, M.L.A. stated in a paper on peete:—

Of insect pests, in their different metamorphoses, we have the grape caterpillar (*Agarista glycine*), mottled red and white; also a large green kind; two kinds of grape grasshoppers; the boring grub in fruit-trees three kinds; the elephant beetles (*Orthorrhinus cylindrirostris*), also borers in the larval stage; and a smaller variety even more destructive than are the larger ones; two kinds of cicadæ, large and small; two kinds of beetles, small, which attack China peaches principally, American blight and codlin moths on apple-treos, and the aphides ou orange and peach trees.

The red-and-white caterpillar has been very numerous of late years, destroying whole vineyards for a season by eating up all leaves and fruit. The large green kind has not been so numerous but is of the same habits. Both kinds of grasshoppers attack the foliage almost from its first start; they hatch about the same time as the first sign of growth appears, and then spoil the young bunches till berries form, and again they nibble the skin of the berries when ripe, making them turn iuto raisins in a dry time, and mould at other wetter time. They also eat pieces out of much of the tree fruit in the same way.

The boring grub or borer pierces the limbs of trees, and lives on the bark, making a cover of its dry excrement, under shelter of which it works, and when disturbed goes backward into his bole. A small variety of a dark colour has much the same habit, but generally takes advantage of some small crack or knot to afford it cover, or otherwise eats its way into the pith of the smaller branches, if there be no other way by which it can get in, such as where a pieco has been broken across or cut off. The large boring grub, which works in the trunk or large limbs of old trees, apparently living on the juice of the wood operated on, changes to a very large beetle with long feelers.

The larger kinds of elephant beetles are very destructive to old vines. The grub of this beetle lives ou the sap of the wood of the vine during winter. In spring it changes to the beetle form, eats its way out of the vine, then travels about and lives on the buds even before or just as they begin to show the first sign of life. Sometimes they eat a hole in the centre by inserting their trunk, but mostly eating the eye clean up. Sometimes a beetle will travel completely round a vine, eatiug out every eye, thereby destroying all prospect of fruit. Even after the shoots are well advanced a great many break off because of being partly or wholly eaten through. The grub is readily found when one is pruning, as often, when a little strain is put on the branch operated on, it will break in consequence of the inside wood being so much burrowed through. The smaller and even more destructive variety—more destructive because of its greater numbers and different mode of attack—has only been known to us within the last ten years or so. It makes its appearance just as the vines commence budding, having apparently come to maturity in the ground, for there is no sign of this sort having bred in the vine. It creeps up the vine stock, and simply punctures the buds with its trunk, and if not carefully taken off will spoil the crop. It is about the size of a wheat grain, sometimes larger, aud of the colour of the bark, and it takes a practised eye to detect it. Both varieties can fly, but wherever this latter variety appears it spreads slowly and surely, and, notwithstanding our best care, is increasing. Hand-picking is the only remedy we know of.

The two varieties of the beetle which attack the fruit, principally the China peach, are well known, and I will do no more than mention them.

The well-known cottony aphis, or American blight, is familiar to all apple-growers, the dark aphis on orange-trees to orange-growers, and peach aphis to peach-growers; and we have many varieties of scale insects all more or less injurious.

When to all the above the deadly *phylloxera* is added, it will be seen that the Australian vignerons and orchardists have a severe battle to fight with insect enemies. One orchardist stated that the

codling moth destroyed 90 per cent of his fruit. Another orchardist stated:—

I have tried various remedies, viz., kerosene and water—1 of oil to 16 of water—syringed on cold, which kills insect pests, but I thought the oil stopped the pores of the leaves, and so somewhat injured the trees; I have also tried tobacco with sulphur, lime, and other remedies, but after experimenting for years I find that a mixture composed of soft soap—made with whale oil —blue oil, and sulphur is the best; sulphur and soap boiled together, oil added after, and syringed on to the trees at a temperature of from 140° to 145° Fahrenheit; if done during dry weather the trees should be syringed with cold water half an hour before using the mixture, so that the latter will adhere or be the more readily absorbed. I find that this mixture, put on properly, will destroy red and white scales, elephant beetle or borer, and all insect pests that I have had to deal with. If trees are badly affected they should be dressed in November, and again in early autumn. Scales multiply faster during autumn than any other time of the year.

But we must quote in full the short but very important paper on the starch remedy,—the remedy of commonsense, and therefore of science, for scale insects:—

RED SCALE ON THE CITRUS TRIBE: HOW IT MAY BE EASILY AND INEXPENSIVELY REMOVED.

The following paper was sent in by Mr. J. Patterson, Tamworth, and was read by the Director of Agriculture:—

I have had occasion to use many insecticides for removal of red scale from orange and lemon trees, and I find that the simplest and most effectual is starch. It is prepared in the following way: 2 lb. of the ordinary household starch are dissolved in a little cold water, then about 2 quarts of boiling water are poured over the starch solution, and stirred until it is thoroughly mixed. Add to this 16 gal. of cold water and stir well. The insecticide is now prepared and ready to be applied to the trees.

The insecticide should be applied with a syringe when the trees are small, or with a spray pump, when the trees are large, and it will cause the following result: The foliage and fruit receive a coating of the starch solution, which adheres to the foliage and fruit, and smothers the scale, and in a few days it will come off in flakes, bringing with it the scale, leaving the foliage and fruit as bright and clean as if the trees and fruit had never been infected with scale.

The insecticide should be applied during sunshine, so that it may dry quickly, and adhere to the foliage and fruit, and carry out its destructive work as intended.

After the trees have been thoroughly treated with the insecticide they should receive top-dressing of stable manure to be dug in the following season, and the cultivator will find that his trees will produce large crops of superior fruit, and will repay him for the labour expended on them.

The grand merit of this application is that while fatal to the insects, it inflicts no injury on tree or foliage. Benzole, which will not mix with water, and "Quibell's insect destroyer" (?) when sprayed, killed the fly on vines and other fruit trees. So in regard to oïdium. Grasshoppers or locusts are as destructive in Australia as in America. When we visited the St. Hubert vineyard in Victoria, grasshoppers were so thick on the earth that they rose in dense swarms as we walked between the rows of vines. It is curious to read that castor oil leaves and larkspur are inimical to these insects. One farmer destroyed millions by putting down straw for the grasshoppers to lay their eggs in, to which he then set fire. The same farmer was troubled by an insect, resembling the Jordan louse, and he said:—

A friend advised him to strip the trees down to the main roots, and to watch the stems carefully. He followed out the suggestion, and soon found out what it was that was killing the trees. The little insects came out in thousands. He made inquiries in order to find out a remedy. He tried 3 oz. of sugar of lead, dissolved and mixed with a gallon of strong whitewash (ordinary lime and water), and, with this mixture, he painted the stems of the trees, and the pest was eradicated.

Our strong belief is that painting with lime alone would, in this case, have been effectual. A member of the conference referred to the peach blight and uttered good commonsense about applying common clay to affected trees:—

A remedy he advocated was to keep the trees warm, and to paint the trees in the winter with a composition of lime and sulphur. This prevented the birth of the aphis in the early spring. Where a tree was badly affected, every bud should be brushed with an emulsion. For the woolly aphis pest he had heard that some gentleman on the Western line had discovered a sure remedy. Many nostrums were recommended for this pest, including kerosene emulsion. In the old country, in his younger days, a simple remedy was used. Clay was mixed with water to a fair consistency, and applied with a stiff brush to all the knobs which appeared on the tree. This was found to answer better than any of the expensive compounds now advocated, and he still used it.

Another fruit-grower said:—

The application of different specifics stayed the pests only for a short time, and the best mode of treatment was to wash the tree well with soapsuds, and then to apply a mixture of boiled oil and sulphur. This paint stayed the blight for fully six months in the year.

Again:—

Dr. Fiaschi, Richmond, said he had had some experience of the woolly aphis blight. An apple-orchard of his was so badly affected with it that he never could get a crop of fruit. He had tried all the remedies suggested, with the exception of liquid clay, proposed by Mr. Gelding. Heavy manuring was one of the treatments he made use of, but it altogether failed. Last year he had intended to have the trees rooted out, and to plant the land with vines, when a gentleman gave him a bulletin of the Californian State Board of Agriculture, wherein was suggested a summer remedy for pears and apples. It consists of the following ingredients:—Caustic soda (98 p.c.) 10 lb., potash 10 lb., tallow 40 lb., resin 40 lb. The directions given with the recipe were—First: Dissolve the potash and soda in 10 gallons of water, and when dissolved place the solution in a barrel (50-gallon measure.) Second: Dissolve the tallow and resin together; when dissolved add the same to the potash and soda in the barrel, and stir well for five minutes or so. Leave standing for about to hours, then fill up with water, stirring well as every bucket of water goes in. Use the following day one pint to a gallon of water, and apply warm. He tried this specific, spraying the trees with it, and he obtained a splendid crop of apples. As to *oïdium*, he did not think there was any cure for it.

Another expression of opinion was:—

It was of no use attacking the insect with poisons—they must stop its breeding. The fine starch mentioned by Mr. Patterson would be fatal, and Mr. Pye had found an application of soap mixture successful.

One gentleman said:—

Had sprayed the trees with a common syringe, with a mixture of unslaked lime and sulphur, three parts to one. If slaked lime were used it would be necessary to boil it, but by using unslaked lime the mixture boiled itself, and thus saved much trouble. It proved better than a kerosene emulsion, because it killed all the moss which grew upon the trunk of the tree.

As a friendly insect, in addition to the "lady-bird," the mantis, or "native lady," was mentioned. Again:—

Mr. Bradbury cautioned the Conference as to the use of dangerous poisons as remedies for pests. He suggested that, if poisons were resorted to, some steps should be taken to prevent the use of arsenic and strychnine by ignorant persons, for if only one or two were poisoned confidence in Australian fruit would be destroyed for years. Scheele's green, which had been mentioned, was a preparation of arsenic; and

so were other specifics which were occasionally used. One gentleman had recommended acetic acid, but it was not necessary to use such poisonous chemicals; there were a number of remedies less dangerous and equally as effective. London purple was an aniline product of coal tar. * All coal tar compounds were effective. Naphthaline and creosote were cheap, but difficult to use. Creosote was not soluble in water, but it was possible to make an emulsion of it with alkalies. Tobacco and nicotine were largely used as specifics, but they were too expensive. A mixture of caustic soda, tar, and resin had been suggested as a cure for apple blight. The first-named ingredient was a dangerous thing to have in the household, and the mixture, when prepared, was merely a resinous soap which could be purchased for a few pence, and thus all trouble and danger would be saved.

Mr. Stiemo inquired what strength of kerosene spray was required for the mussel blight (*Mytilaspis pomorum*).

Mr. Thompson replied that the emulsion was prepared in this way:—To one gallon of milk, brought up to boiling point, add two gallons of kerosene. If preferred they could use half a pound of soap to a gallon of water, brought to boiling point, and the kerosene churned in that for some time. This, with nine or ten times the quantity of water, could be effectively applied with a common cyclone-nozzle.

The digging in of ashes round the roots of trees was said to prevent pests. I have quoted very largely already, but to make the information on insecticides complete I must add the following summary of the results of very dearly bought experience in America as to the best remedies for pests:—

INSECTICIDES.

The following notes by Dr. J. C. Neal, the Entomologist to the State Agricultural College, Florida, U. S. A., will be found of interest:—

Nothing has been done in practical entomology that has shown better results than the use of emulsions containing kerosene or insoluble poison held in suspension, and their application to infected plants in a fine spray by various atomizers and spray pumps. With one of these machines an insecticide can be brought into contact with the insect, and its feeding ground thoroughly impregnated with poison. It is needful that the spray be very fine, and that it be applied with force to reach every infected part, or the hiding-places of insects. For cases like infected buildings, as chicken-houses, that are usually very difficult to keep clear of mites and tick-fleas, the spray of carbolized whitewash, tobacco, kerosene, oil of tansy, &c., is easily applied.

I append a few formulas that have been tried and found to be valuable:—

I. SOLUTIONS.

1. Tobacco, 1 lb.; boiling water, 3 gallons, strain when cool. Very effective when used as a spray against flees, beetles, lice, aphides (plant lice), and ticks.

2. Quassia chips, 1 lb.; boiling water, 3 gallons. This very bitter solution is good for prevention rather than cure. Apply as a spray to rose bushes and to kill plant lice.

3. Pyrethrum: 1 ounce of the "Buhach" powder added to 2 gallons of cold water for cabbage, beets, tobacco, or any plant used for food, as this is not poisonous.

4. London purple, Paris green; actively poisonous. Use 1 lb. of the poison to 200 gallons water or other solutions. Dissolve a little flour paste in the water to make it sticky. Stir frequently. Applied to trees, it is a sure cure for all insect plagues.

5. Bordeaux mixture: this, while primarily a fungicide, has some good qualities as an insecticide. It is prepared thus: 1 lb. sulphate copper, dissolve in 1 gallon hot water in one vessel; in another, 1 lb. rock lime is slaked in 1½ gallons *cold* water, and, when cool, pour into the copper solution and strain; add 2 gallons water, and it is ready for use. (Cook.)

6. To this, add London purple, 1 lb. to 200 gallons of the Bordeaux mixture. This sprayed over non-bearing grape, vines or tomato vines not in bloom, &c., will prevent rot and insect life as well.

7. Soap: 1 lb. resin soap to 1 gallon hot water. This, used as a spray, is often a valuable remedy for the attacks of small and soft insects. In fact it can be used to advantage for soft scales, when they are few. It should be often used to get the best effect.

8. Water in which tar has been placed acquires some value as an insecticide.

II. EMULSIONS.

(Soap is used as the basis of most of these.)

1. Stronger emulsion of kerosene: 4 lb. soap, dissolve in 1 gallon hot (boiling) water; remove from the fire and add 2 gallons kerosene while hot. Churn with a spray pump violently till the oil is emulsified; add 27 gallons cold water for use.

2. Weaker emulsion (Cook): 1 lb. soap, dissolve in 2 gallons hot water as before, but add only ½ gallon kerosene and dilute till 8 gallons solution are made. Adding ½ pint spirits turpentine to No. 1 increased its stability (Tracy). Allowing even 40 gallons of water to be added to 1 gallon of the emulsion and sprayed on tomato worms, it was very effective, and did not injure the plant in the least.

3. Emulsion 1: Adding 2 oz. of balsam of fir with the kerosene makes an emulsion that adheres better to the surface of leaves, and is slightly superior to No. 1 for the armoured scales.

4. Using emulsion 2, only substituting the same quantity crude carbolic acid for kerosene, is especially valuable for oak and pear insects.

5. The same formula, using oil of tansy or sassafras 1 oz. in place of the ½ gallon kerosene, is efficacious for roaches, mites, ticks, bed-bugs, and pests.

III. ARSENICAL, RESINOUS, AND OTHER COMPOUNDS FOR SPRAYING.

1. To kerosene emulsion No. 1 add 1 oz. London purple, and mix well. Highly recommended.

2. Resin compound: Caustic soda, 1 lb.; resin 8 lb.; to make 32 gallons compound. Dissolve the soda in 1 gallon boiling water; take out half; add the resin slowly to the remainder and boil, stirring rapidly; when dissolved, add slowly the part taken out. Dilute till it will pass readily through a thin cloth, which should be always done. Dilute before using to 32 gallons. This alone is very valuable against most scales, but the addition of 2 oz. London purple makes assurance doubly sure against even the dreaded *Icerya*.

3. White arsenic, ½ lb.; sal soda ½ lb.; water, ½ gallon; boil till a solution is made, then dilute to a gallon. 1 quart of this to 50 gallons resin compound—use on peach, pear, and plum, either after fruit is gathered or just as bloom has fallen.

IV. POWDERS.

1. While slaking 1 peck fresh lime, add 1 quart kerosene, sift out lumps; apply lightly to cucumbers, melons, and tomatos, for beetles and squash-bugs.

2. 50 lb. land plaster, mix 1 pint crude carbolic acid; sprinkle over leaves and vines for aphides and beetles.

3. Pyrethrum: This, the powdered flowers of the pyrethrum, when fresh, is especially valuable if sprinkled on infected leaves, or in boxes, drawers, &c. House flies and mosquitoes are easily subdued by closing up the room tightly and slowly burning in it a spoonful of the powder. It is slightly narcotic, but not at all dangerous to human life. For infected cabbage, lettuce, celery and the like, or tobacco, it is the best insecticide we have, involving no danger if eaten.

* London Purple is a refuse obtained in the manufacture of aniline dyes, and consists of lime, arsenic, and carbonaceous matter. It was first used against insects in America in 1878, and is there much prized on account of its cheapness as against Paris green which costs twelve times as much. It is more soluble, less poisonous, more adhesive and permanent in its effects, and of a decided colour. It is now imported by Elliott Bros., O'Connell-street.—*Editor*.

4. Tobacco: This insiduous narcotic is valuable in the destruction of plant-lice, mites, &c. Applied as a powder or by its fumes it often is quite beneficial.

Bisulphide of carbon, like chloroform, is highly volatile, but its vapour, unlike that of chloroform, is very explosive. Bins and corn cribs can be easily rid of ants, weevil, rats, mice, beetles, &c., if the room be made air-tight, and occasionally filled from the top with the vapour of bisulphide of carbon. This is the only way in which our farmers ever will keep corn, peas, &c., from insect attacks.

Of course kerosene and such arsenical poisons as Paris green and London purple are chemically active, but for the destruction of green bugs, if we were troubled with the pest, we should feel much inclined to try a decoction of gum leaves and mana grass, brought up to a sticky consistency by mixing starch or flour, gum, clay and lime, with some sulphur added. If a covering of this stuff were applied to the green bugs in dry weather and left on for a few days, I believe the parent scales and their enclosed progeny would be smothered to death and come off in flakes with the preparation. If inclined to stick, the application and the insects could be washed off, with water, or a decoction of gum leaves or coarse lemon grass.

In Australia the fruit growers have other enemies than insect or fungoid pests to contend with. One authority states that birds, including the improved sparrow, are still worse, insectivorous birds often feeding on friendly insects, such as the mantis. Imported hares, too, are hurtful, but most destructive of all are perfect clouds of the large frugiverous bat known as "the flying-fox," which are so cunning that it is difficult to lessen their numbers by powder and shot or even dynamite. Neither birds nor bats, I believe, have ever been known to meddle with coffee berries, on which however, monkeys and jackals have been known to feed, while the jungle rats in one year destroyed £10,000 worth of coffee in the region whence I write. Bandicoot rats have occasionally rooted up a few tea trees; but, on the whole, it is seldom that so large an expanse of one cultivation as the tea fields of Ceylon compose has been so little affected by injurious animals, birds, insects or fungi. Long may this happy immunity continue!

HE DIFFERENCE IN THE RAINFALL AT THE BEGINNING AND THE END OF NOVEMBER—THE RAINFALL AT NUWARA ELIYA, HAKGALA AND ABBOTSFORD AND OF OTHER PLACES—EXPLANATION OF DIFFERENCES IN RAINFALL—VARIATIONS IN MEAN TEMPERATURE AND IN MAXIMUM AND MINIMUM SHADE TEMPERATURE—HEAT IN THE SUN—NOCTURNAL RADIATION—CEYLON "PEAT" —THE ALLEGED DISCOVERY OF BITUMINOUS COAL AND ANTHRACITE ON ROTHSCHILD ESTATE—HOW TO TREAT PEATY SOIL—EFFECTS OF A HAILSTORM ON TEA AND CINCHONA—HAIL IN INDIA AND OTHER COUNTRIES —CAUSES OF HAIL—CHANGEABLE WEATHER.

NANUOYA, Dec. 1st.

This morning I mentioned the contrast between the early portion of November, when we were all asking "What has become of the north-east monsoon?" and the latter portion, of the month during, which the answer has been emphatically given in the shape of thunder-and rain-storms, with occasional semi-gales of wind. The figures for rainfall and rainy days will show how striking the contrast has been. From Nov. 1st to the 16th, rain fell only on 5 days and on three of these the measurements were only 5 cents on 2 days and 2 cents on 1, the total for the 16 days being only 75 cents of an inch. From the 17th to the 30th, on the other hand, the rainfall, on 11 days has been 8·80 inches, 5 out of the 11 rainy days giving such storm quantities as 1·38, 1·47, 1·36, 1·48, and yesterday 2·09. This latter burst sent the rainfall of November up to 9·55 against a 7 years' average of 7·37; the total for the 11 months of the year being 85·93, against an average of 84·32. We are thus 1·61 inch above our average quantity, while our rainy days number 190 against 192. Unless, therefore, December turns out an abnormally rainy month, we are likely in 1890 to realize very closely our 7 years' annual average of 92·11 inches of rainfall on 209 days: only slight rain falling on fully one fourth of the number. At an elevation of about 5,800 feet and facing the south-west, this gives us 5·14 inches more than Hakgala (altitude 5,581 and facing the north-east) receives and 5·95 less than is deposited at Nuwara Eliya, which is situated between the two monsoons, at an elevation of 6,240 feet above sea-level. The averages of the three mountain stations are:—

Nuwara Eliya	6,240 feet	98·06 inches.
Hakgala	5,581 ,,	86 97 ,,
Abbotsford	5,800 ,,	92·11 ,,

There is here a graduation according to elevation, but the principle by no means holds generally g ood the river valleys below the three stations getting from 100 to 150 inches of rain, while the ranges which face the south-west monsoon, at an elevation of 3,000 to 4,500 feet, get 200 inches up to 250. Theberton estate, Maskeliya, with an annual average of 217 inches, is only 3,315 feet above sea-level, while Padupola, believed to be the rainiest station in Ceylon, is still lower down. The region round about Nuwara Eliya, protected from the extreme moisture of the south-west monsoon vapour-clouds by the Adam's Peak ranges, is fortunate in enjoying the happy mean for tea cultivation of 100 inches down to 80. Even 70, well distributed, suits this most cosmopolitan of plants.

The disproportion of rainfall to elevation is easily explained by the relative positions of mountain ranges to the course of the sea-vapour-laden monsoon winds, but it is not so easy to understand the varying rate at which MEAN *temperature* decreases with varying altitudes. The difference of level between the observatories at Colombo and Nuwara Eliya is 6,200 feet (the Colombo observatory being 40 feet above mean sea-level), and the reduction of mean temperature, in proportion to ascent, is from 80·7 at the sea station to 57·7 in the mountain sanatorium, a fall of 23 degrees, or 1 degree for every 269 feet of altitude. This fairly agrees with the formula we have seen in books on meteorology. But when we come to compare Colombo with Hakgala at 5,581 feet, with a mean temperature of 61·2, the reduction of temperature is only 19 5, or 1 degree for each 291 feet. The higher temperature in this case, compared with Nuwara Eliya, apart from difference of elevation, may be due to the fact that the great isolated mountain is densely forested, and faces the warm valley of Uva? But Badulla, 2,225 feet altitude and 72·8 mean temperature, is *in* that warm valley, and yet the reduction of temperature, as compared with Colombo, is in this case 8 degrees, or a fall of 1 degree for every 273 feet. Very different indeed is the case of Kandy, elevation 1,696 feet and mean temperature 75·9. This is only 5 degrees lower than Colombo, or only a fall of 1 degree in 332 feet, against 269 in the case of Nuwara Eliya. Can this great difference be due to the sheltered position of Kandy and the heat of the sun reflected, during the day, from the white, quartzy sand of the roads and the undarkened whitewash of the houses? The differences, hitherto, in the rate of depression for altitude have not been excessive, but we are utterly puzzled when we come to compare Badulla with Kandy. For an elevation higher by only 529 feet, the fall in

temperature, at Badulla, is 3 degrees, or 1 degree for every 176 feet! I suppose radiation of heat into space in the clear weather which so largely prevails on the wide plain in which Badulla is situated, and evaporation from the surrounding paddy-fields, affect the minimum temperature largely and so reduce the mean? But what a contrast when we come to compare the low mean temperature of Badulla with the comparatively high mean temperature of Hakgala. The higher elevation of the great Uva mountain above the capital of the Province is no less than 3,356 feet, and yet the temperature is lower only by 11 degrees, or only 1 degree for every 305 feet. Against this we have so rapid a fall as 1 degree for every 165 feet, for the 669 feet which Nuwara Eliya is higher than Hakgala: Nuwara Eliya being 4 degrees colder. We cannot doubt that the more intense cold in the case of the sanatorium is due to its situation in a grassy, damp plain, favourable to the reduction of temperature by radiation of heat into space on clear nights and the large evaporation of moisture by means of the tropic sun-rays, and of winds which, in the north-east monsoon months of December to March, are frequently quite dry and therefore ready to absorb all the moisture they meet. Hakgala, on the other hand, besides the influence of the warm valley of Uva and its lower elevation, is clothed with forest; so that, where the observatory is situated, radiation and evaporation are both at a minimum. Of course forest and forest land cleared and planted, in Nuwara Eliya, have warmer temperatures than the exposed position where the observations are taken. The proof of this is the wonderful luxuriance with which tea grows on the edges of the ancient lake basin, up to 7,000 feet on the slope of "One Tree Hill." The final average of all the varying deductions I have drawn from the Ceylon Meteorological Report for 1889, is a fall of 1 degree for every 258 feet of altitude, against the 269 feet for every degree of lowered mean temperature between the two stations of Colombo and Nuwara Eliya. Taking the round number of 1 degree for 270 feet, the mean temperature of the summit of Pidurutalagala, the loftiest point in Ceylon, may be taken at about 50 degrees; of the summit of Adam's Peak, 52 degrees. Considering the prevalence of cloud, the minima of the mountain tops may not be lower than the minimum of Nuwara Eliya, where freezing point is occasionally attained on clear nights. If our calculations are approximately correct, the difference of mean temperature, between Mannar with 81·5 (the highest *mean* temperature recorded) and Pidurutalagala summit is 31·5; between Colombo and the culminating height, 30·7, and between the capital and the "Sri Pada" on Adam's Peak, 28·7. These are approximations founded on the known differences of *mean* temperature, between Mannar with the highest observed mean of 81·5, and Nuwara Eliya, the lowest, with 57·7. Maximum shade temperature is quite another matter. The highest at Mannar in 1889 was only 98·5 in September. But Trincomalee with a mean shade temperature of only 80·7 (exactly the same as Colombo) occasionally exceeded 100 deg. in six out of the 12 months of 1889, the extreme of 101·7 being attained on May the 12th. For extremes of heat, therefore, Trincomalee takes the lead of all stations in Ceylon, although inferior to Mannar for sustained average heat. Contrasted with the maximum shade temperature at Trincomalee in 1889, we have the Nuwara Eliya minimum of 36 deg. in January. When we come to "heat in the sun"=what the meteorologists call "Equilibrium temperatures of solar radiation," but about which they do not feel by any means so confident as in regard to shade temperature, we actually get a maximum of 165 degrees at Jaffna and 164 deg. twice at Trincomalee, once at Anuradhapura and once at Vavuniyanvilankulam in 1889. That represents, approximately, the amount of sun-heat which finds its way to the surface of the earth through its atmosphere. The contrasts to such figures for solar heat are those for "temperature of nocturnal radiation," the minimum of which at Nuwara Eliya in January and December was 32 deg. against 37 deg. at Hakgala in December, and 62 deg. at Colombo in January. But I must defer further notice of the interesting Report on the Meteorology of the island for 1889, issued from the Surveyor-General's Office, because, before returning "from the Hills," I must answer as I can the following question respecting the best mode of cultivating "peat":—

"Can you name me any book in which I could obtain any knowledge of peat and its culture? Dr. Angus Smith of Manchester I believe read a paper on the subject some time ago."

The pseudo-peat of Ceylon was, no doubt, specially meant, a substance which exists in varied conditions from the fairly good deposits at Muturajawela, near Colombo, up to the more or less decomposed reeds and rushes and grasses in the ancient lake bed of Nuwara Eliya. We have not, to my knowledge, true peat or lignite in Ceylon, and I await further information as to the alleged discovery of associated bituminous coal and anthracite on Rothschild estate, Pussellawa. A small fragment which I procured and sent to Mr. Alexander Murray wss pronounced by that gentleman to be anthracite. But if the small specimens produced are not due to the action of fire on British coal used on the estate, we surely might expect that, ere now effectual measures would have been taken to set at rest the reality or reverse of an alleged discovery (in which Mr. LeMesurier has faith, but which Mr. Geo. Armitage, I believe, doubts) calculated, if real, and if the substance should be found in quantity, to be of such immense value to Ceylon, especially to its staple tea industry. About the alleged Rothschild coal discovery, more will, no doubt, be heard; and meantime, to return to a much lower carboniferous formation which we have in Ceylon, as a preliminary to answering the question fully I told my correspondent that he could not go wrong in resorting to drainage and the application of lime. That is what is mainly desiderated in the case of the peaty swamps of Nuwara Eliya and the upland savannahs generally. Of course if forest soil could, at any ordinary expense, be added, so much the better. In any case the drainage and turning over and aeration of the swamp soil and the burning of portions into ashes to be applied to the rest would be certainly beneficial. I have not seen the recent paper on peat culture, to which I was referred, and I have not the most recent authorities here to consult, but I feel certain that I have indicated the main principles of treatment: drainage, aeration, lime, ashes and, if possible, fresh soil or clay. Bone dust, superphosphate, and even sulphate of lime, if they could be afforded, would be still more valuable additions to the peaty humus. In confirmation of my views, I find on referring to Johnston and Cameron's Elements of Agricultural Chemistry and Geology, 11th Edition, 1878, the following passage: "We know that by draining off the sour and unwholesome water, and afterwards applying lime and clay, the surface of peat bogs may be gradually converted into rich corn-bearing lands." The process thus described was very familiar to me in my youthful days in the Highlands of Scotland, where vast expanses of moors and mosses, in the

Black Isle (Eilandhu) of Ross-shire were redeemed by the application of clay found close at hand and lime imported from "the South." The clay from which bricks have been made at Nuwara Eliya could be utilized for redeeming the peat land, and if some of the clay as well as some of the peat could be burnt and the carbonized matter or ashes applied as a surface dressing, so much the better, I venture to say. And some of the superfluous peat in the swamps thrown up from deep drains could also be used with advantage in forming composts for the Nuwara Eliya vegetable and fruit gardens and even the tea estates. There can be no better absorbent of excrementitious and ammoniacal matters than dried peat, or peat ashes. In the work I have referred to the constituents of a peat compost are thus given :—

Dry earthy peat	... 40	bushels.
Ammoniacal liquor from gas works	20	gallons.
Bone dust	... 7	bushels.
Sulphate of magnesium	... 1	cwt.
Sulphate of sodium	... 7	bushels.
Common salt	... 1½	cwt.
Quicklime	... 20	bushels.

These materials were, by a Mr. Fleming, mixed together and put into a heap, allowed to heat and ferment for 3 weeks, then turned and allowed again to ferment, when the compost was ready for use. On referring to the *Penny Cyclopedia*, I find that eighty years ago Lord Meadowbank gave directions for a rich peat compost, by means of alternate layers of peat and farmyard manure, rotten fish and other animal matter of all kinds being added and lime or ashes being scattered over the heap before being covered up to ferment. The principles in each case are the same, the special value of the peat consisting in its absorbent qualities.

The great object in Nuwara Eliya, of course, will be to convert the swamps into grass lands : meadows or lawns ; and for this purpose, drainage and levelling will constitute the main preparations, a comparatively slight surface application of lime and clay sufficing. For the cultivation of vegetables and of fruit and ornamental trees, more elaborate and expensive treatment may be necessary. The peaty formations near Colombo were in the coffee factories used, mixed with coffee chaff, for steam engine furnaces, and the peaty stuffs in Nuwara Eliya and upcountry generally might be useful in tea factories, if compressed in moulds, turned out and dried like bricks, or rather like the forms in which fuel peat is prepared in so many parts of the world. Peat might also be used to absorb and deodorize petroleum, when used as a fuel. Peat-litter is valuable in stables and when thus saturated with ammoniacal matter as manure for gardens. Peat is largely humus ; and moist humus, or the water in which humus is dissolved, is a powerful dissolvent of mineral matters. Hence peat would rapidly assimilate bones, coprolites, pieces of limestone &c. Peat used as litter in stables or for closets would act not only as an absorbent but as a deodorent. Peat after being used in closets and urinals has produced wonderful results in orchards and vineyards. It follows that if peat is to be cultivated *in situ*, the more of ammoniacal matter, with potash, lime and phosphates, that can be added, the better. That peat, especially such peat as we have in Ceylon, contains all the elements of plant life, as I have seen asserted in articles read by me for the purpose of this notice, I do not believe. What I do believe is that by the abstraction of moisture, by aeration and the addition of mineral matter in the shape of clay (or forest mould) lime, ashes, bones &c., the carboniferous substance can be converted into rich orchard soil or beautiful and profitable meadow land.

While I am writing, a letter and specimens of cinchona and tea leaves are sent up from "the lower division," to show the effects of the hail which I mentioned as accompanying the thunder, rain and cyclonic wind-storm of Friday last, when the coolies complained that the crystals of congealed moisture "burnt their feet." On the upper portion of the estate no appreciable damage seems to have been done, but here is the report from 1,000 feet further down in the valley of the Dimbuldanda, where the small tornado was more violent even than what we experienced :—

"I send some twigs of cinchona and tea to show you what damage the hailstones did. I was extremely disgusted to see the tea bushes looking so shuck in places this morning, and at first could not make out what it meant. Fortunately the storm must have passed over the place in wavy streaks as only occasional patches are much injured, otherwise the damage might have been very serious. As it is we may feel its effects for a little, though not to any great extent, I hope. I can now understand what a severe hailstorm means to our Indian friends. The young soft leaves on the tea *seem* to suffer less than the old hard ones. A few which I enclose look as if they had been at Waterloo."

The writer might well think of the effects of showers of shot in battle, for the cinchona and tea leaves which accompanied the letter are riddled and torn after a fearful fashion, as you will see from the specimens I enclose. The first block of this estate (Abbotsford) was purchased just a score of years ago this month ; and during the whole of its history since, we have had no such visitation as is now recorded. We have heard stories of big hailstones elsewhere which we considered apocryphal in some of their sensational details; especially a tale from Haputale of lumps which remained unmelted for a couple of days in the coolies' lines ; but we now believe in the potent reality of hail, the product of the "long-looked-for-come-at last" electricity ? or of the sudden fall of cold air from the higher air into the lower, owing to sudden and limited local atmospheric depression ? Curiously enough Blanford, in his work on the climates of India and Ceylon, says nothing about the formation of hail, which is frequent and destructive to tea plantations in the valley of the Brahmaputra and elsewhere in Assam, while in Northern India the hailstones are sometimes of such a size as to kill large numbers of cattle and even prove fatal to human beings who have been exposed to their violence. Hartwig, in his "Aerial World" states that in temperate climates hail storms are frequent on the plains, while in tropical countries hail rarely occurs under 1,800 feet altitude ? Hail in the mountain region of Ceylon seems more prevalent on the eastern or north east-monsoon-side, than on the western ; the phenomenon being not uncommon in Uva, where it has sometimes occurred on a scale which involved considerable damage to crops. Hartwig in his "Aerial World" states :—

"Hail is beyond all doubt one of the most enigmatical atmospherical phenomena, as it is one of the most destructive. No meteorologist has been able yet to explain in a perfectly satisfactory manner how hailstones of such considerable size are able to form in the clouds in so short a time, and often in the most sultry weather. On Volta's Theory the hailstones are successively attracted by two clouds charged with opposite electricities, and thus grow until they fall; but if the hailstones were thus attracted, it seems much more probable that the two clouds would be mutually attracted and would unite.

"The sudden irruption of cold air streams into a hot atmosphere charged with aqueous vapour, or the rarefaction and consequent refrigeration of the air produced by the rotary winds, have likewise, been called in to explain the mysteries of hail; but the most sagacious theories have hitherto found more

opponents than adherents; and not one of them is free from serious objections. Evidently there are influences at work in the clouds which we are not yet able to measure, and the causes of many of the revolutions of which they are the scene are still as unknown to us as they were to the philosophers of ancient times."

One thing seems certain, however,—that the phenomena of thunder and hail are closely connected and that the conditions which favour discharges of electricity favour also the formation of hailstones. This view is supported by the following extract from the valuable compilation already quoted:—

"The chief characters which distinguish hailstorms from ordinary thunderstorms are the peculiar rattling noise which precedes the fall of the hailstones, the whitish colour of the cloud-stripe in which the latter are formed, and a darkness which Tessier compares to that which is occasioned by a total eclipse of the sun. According to Professor Muncke's observations, single flashes of lightning and abrupt thunder claps are not so common at the beginning of a hailstorm as a continual discharge of electrical light and an uninterrupted rolling of thunder. After a thunder cloud has rained for some time, the danger of a destructive hailfall is generally past. In most cases hailstorms begin with the phenomena above described; a thunder-clap of surpassing violence ensues, then follow single heavy drops of rain, succeeded by single small hailstones, and by the pelting hard shower which, with short periods of intermittence, and accompanied with thunder and lightning, generally lasts but a few minutes."

The above description very closely applies to our short, sharp cyclonic thunder-hail-and-rain-storm of Friday, which lasted less than half-an-hour, depositing in that period over an inch of rain, mixed with the hailstones which burnt the coolies' feet and riddled the leaves of a few of our cinchona and tea plants. As an atmosperical phenomenon, such a compound storm is interesting, once in a way; but one occasion in a score of years, for the recurrence of similar conditions, will suffice to excite feelings less pleasant than those of scientific curiosity. The fall of hail from the atmosphere, so destructive of vegetable, animal, and even human life and property in some parts of the world, seems as great a mystery as the vesting of certain snakes with venom and certain fishes with benumbing electrical powers.

NANUOYA, Dec. 3rd.

Considering that our *albizzias* are a year younger than the Nawalapitiya trees and grown at an altitude about 3,000 feet higher, they do not compare badly. The details of some are:—

Height 85 ft.	Cir. of stem	5' 10"	Single stem
" 75 "	do.	5' 5"	Do.
" 75 "	do.	6' 7"	Branches into 3 at 6 ft. from ground.
" 78 "	do.	5' 8"	Do.

The growth of these trees in both localities is surely phenomenal.

The forests around us, sloping up to Nuwara Eliya are putting on more and more brilliant colouring every day. We part, this morning, from them and "the Hills" with regret.

CINNAMON CHIPS.—The recent of today's meeting with its miserably poor attendance of five persons, shows to our mind that not only was no abiding interest felt by the majority in the movement to put a check on the export of "Chips," but that the agreement honorably entered into, cannot virtually have been kept as promised. The meeting very wisely therefore considered it expedient that the agreement should be cancelled. The only gentlemen present besides Mr. Jardine, Chairman, were Messrs. J. W. de Soysa, Fonseka, (father and son), M. Cockburn; and Mr. de Mell looked in after the meeting was over,

CATTLE TREATMENT IN MADRAS.

The Madras Agricultural Department has hitherto had a branch specially devoted to the investigation and treatment of cattle disease. This, we regret to see, is now to be abolished. It is the old story of efforts made on the ryot's behalf and rendered futile by the ryot's insuperable apathy. In the presence of the stock inspectors, as Mr. Hazelton, the Inspector of Cattle Diseases in the Presidency, tells us, their advice was frequently adopted, but directly they left the neighbourhood, it was found that no further trouble was taken. "Nearly all the stock inspectors complain of the little assistance they receive from the village officials; and as the stock inspectors can hardly hope to become personally acquainted with the majority of the ryots of the district, this want of interest on the part of village officers, in a subject which so nearly concerns them, has a very marked effect on their work." The Local Government has accordingly come to the conclusion that any attempt to directly combat cattle disease is, in the existing state of feeling among the farming classes, practically useless. To those who recognise how much the welfare and prosperity of the mass of the population depend on the improvement of agriculture, and how important to this end is a good and healthy breed of cattle, this example of stupid indifference set by the Madras ryots is distinctly depressing.—*Pioneer.*

KELANI VALLEY: HEAVY YIELD OF TEA IN THE VALLEY.—Ruwauwella Division, Dec. 1st.—I never saw the tea in the K.V. looking better. I fancy if "Burra Fajur" could see it now he would retract his opinion of four years ago—that the places would never keep up their yield. I know of more than one place that with still a month of its year to run has given over 600 lb. per acre. One place the day I was there got an average of 23½ lb. a cooly from eighty pluckers off an 8-day flush. Mr. Hardie has resumed charge o. Indurane, and Mr. Kingsford has returned to Madulf tenne. I hear there is to be another change in the district shortly.—Local "Times."

NUWARA ELIYA CARP.—We call special attention to Mr. LeMesurier's letter in another column which shows the good service done to the island by the fish culture experiments with which the Nuwara Eliya Assistant Agent has so closely identified himself. Not only private individuals, but Government must bestir themselves to take full advantage of the ample supply of fry now available for stocking ponds and tanks. An item in the Supply Bill report is "R2,000 for the purchase of freshwater fish for stocking the rivers, lakes and tanks in the interior"; but is due advantage being taken by Government of the carp fry available at Nuwara Eliya and could any better fish be got for local purposes in tanks, &c.?

QUININE.—The London market has been very quiet this week, and almost the only sale reported is of a parcel of 5,000 oz. German from the makers at 12½d per oz. January delivery. On the spot we make 12d per oz. the nearest quotation. The imports of quinine into the United States during the ten months of the year were 2,850,000 oz., against 2,168,000 at the corresponding date of last year. It is reported that the departure to Europe from New York, during the last days of October, of a representative of one of the American quinine-works has given rise to a good many rumours as to the cause of his visit. In some quarters it is believed that his mission is connected with a plan to revive the effort to organise a combination of the producing interests of Europe and the United States. The Java Cinchona Planting Company, "Kertamanah," in Amsterdam, has paid a preliminary dividend of 6 per cent for the year 1890.—*Chemist and Druggist*, Nov. 15th.

COFFEE LEAF DISEASE.

At a meeting of the Wynaad Planters' Association on 5th November last, among other business (Mr. J. F. Jowitt being in the chair) it was noted :—*Leaf Disease.*—The Honorary Secretary read a letter from his London agents saying that experiments with the hand power Strawsonizer were not as yet sufficiently complete to enable the makers to put it on the market.

The Honorary Secretary stated that a member of the Association had recently returned from Naples where he had had an interview with Col. Ginseppe Novi, who has recently experimented on the Phylloxera, and was anxious to experiment on the Hemileia Vastatrix, that he had brought back with him a ton of a mixture for the treatment of the Hemileia which he had placed at the disposal of the Honorary Secretary. Another member of the Association writing from Rotterdam promises the translation of a pamphlet lately published there on the propagation of the Hemileia fungus.

THE AMSTERDAM CINCHONA AUCTIONS.

AMSTERDAM, November 6th.

At the cinchona sales held here today a large quantity of Java cinchona bark, containing the enormous equivalent of 741,000 oz. quinine, was offered for sale. The greater part of the holders showed themselves willing to make concessions, and 4,281 packages sold at a decided decline, the average unit being only 8 cents per half kilo., or about midway between 1⅝d and 1½d per lb., less by about 8 per cent. than the price of Tuesday's London auctions. The following is the range of prices paid :—Manufacturing barks, quill, broken quill, and chips, 10 to 70 cents (=1¾d to 12½d per lb.); ditto root, 18 to 58 cents (=3¼d to 10½d per lb.); druggists' barks in quill, broken quill, and chips, 8 to 78 cents (=1½d to 1s 2d per lb.); and druggists' root bark, 12 to 22 cents (=2d to 4d per lb. The principal buyers, in order of their purchases, were Messrs. C. L. Schepp & Zoon, Rotterdam; Messrs. Matthes & Bormeester, Amsterdam; the Brunswick Quinine Works; and the Amsterdam Quinine Works. —*Chemist and Druggist.*

ARTESIAN WELLS AT QUETTA AND MADRAS.

Artesian wells are being bored successfully in various parts of Quetta, and one in Sir R. Sandeman's compound is worked by a windmill (an American patent) much to the astonishment of the natives.

A bore at Negapatam has been sunk to a depth of only 200 feet which in the country of Artois itself would have been considered extremely moderate and far below the average. With a bore of this depth the water rose to within one foot of the ground surface, thus practically demonstrating that an artesian spring had been struck. In the Madras Presidency at least wells have not been bored to any great depth and great advantages might accrue if the Negapatam Councillors persevered in their efforts to sink the bore deeper, even though it may not be clear to them that better results would be achieved. The Government order on Dr. King's Report promises help from Provincial funds as an inducement to the Councillors to continue work. As it now stands the well is a success in as far as the two essential requisites of a water-supply, namely, quantity and quality, have been secured.—*Indian Engineer.*

[It is rumoured that the mission of the Director of Public Works, Mr. MacBride, who is leaving for India shortly, is to inspect work done in Artesian wells with reference to the requirements of the Jaffna Peninsula and other parts of the island.—ED. *T. A.*]

PIGEONS AND BEES.—Says a writer in the latest *Cornhill*:—An American passenger pigeon passes the Atlantic Ocean in two days and two nights, flying at the rate of 1 600 miles a day. A curious account is given of a race between bees and pigeons, in which the first bee finished a quarter of a minute before the first pigeon, three other bees beat the second pigeon, and eight bees and eight pigeons made a dead heat over a course of a league.

THE NEW COCONUT PRODUCT.

Paragraphs have been going the round concerning a new manufactured product of the coconut, which is spoken of wrongly as "coconut butter." Being regarded as a butter, and produced at about half the average market price of ordinary butter, some writers have fallen into the error of regarding it as a new adulterant of dairy produce, and a rival to margarine. In the first place it is not a butter in any sense of the word, and in the next it is not at all likely to be employed as an adulterant by reason of its peculiar flavour and colour. It is, in fact, a vegetable lard, and as such is intended to be used in cooking, and perhaps in pharmacy. The natives of India use a large quanity of fat under the name of "ghee," answering in colour and quality to our "lard." It is the product of buffalo milk, and inasmuch as Hindoos will not use any animal fat, and the Mahommedans avoid the use of hog's lard, this ghee is the only article in use throughout India for culinary purposes, and it is rather dear, for there is a large demand for it, and the supply is limited. The newly-introduced coconut fat is said to be both a better and cheaper article which cannot fail to commend itself to the Hindoos and Mahommedans, and so come into extensive use throughout India as a purely vegetable product.—*Burgoyne's Monthly Prices Current.*

THE NEW DIMBULA COMPANY, LIMITED.

REPORT, SEASON, 1889 90.

The Directors have pleasure in presenting their Fifth Annual Report.

The yield of coffee, cinchona, and tea, has in each case exceeded the estimate, and good prices have been realized. The quality of the tea is well maintained. The reports received by the Directors of the present condition and unfavourable future prospects of the coffee cultivation have induced them reluctantly to consent, as a precautionary measure to have a portion of the remaining coffee land interplanted with tea. Cinchona has been suffering from repeated attacks of caterpillers, which have caused some mortality among the trees. Tea is progressing satisfactorily, and the Directors anticipate a substantial increase in productiveness during the present season. The accounts now presented show a surplus of £4,661 after crediting "Tea extension fund" as usual, with a proportion of the cinchona proceeds, and after writing off a due proportion of the "Factory and Machinery Account." The Directors propose a Dividend at the usual rate of 8 per cent per annum, on the A Shares for the year ending 30th June last, one-half of which was paid in March last. In accordance with the hope held out at the last General Meeting, the Directors were able to pay 2 per cent on the B Shares in March last, and they now propose a further payment in reduction of the cumulative dividend accruing on these shares of 4 per cent. The Directors have much pleasure in recording their appreciation of the energetic and efficient manner in which the Manager and Superintendents continue to conduct the affairs of the Company in Ceylon. Mr. Carver having retired from the Board, the Directors have elected Mr. William Herbert Anderson, late of Holyrood estate, to fill the vacancy.—By order of the Board, J. SWAN, Secretary.

52, Gracechurch Street, London, E. C., Oct. 27th.

THE NEW DIMBULA COMPANY, LIMITED.

Working Account, 1889-90, for the Season ending 30th June, 1890.

Dr.

	£	s.	d.	£	s.	d.
To Ordinary Expenditure in Ceylon—						
Coffee	3,124	7	7			
Tea	6,555	18	11			
Cinchona	857	1	4			
				10 537	7	10
Two two-thirds of proceeds of Cinchona transferred to "Tea Extension Fund" ...				2,016	0	0
To amount written off "Factory Account"...				1,560	0	0

	£	s.	d.	£	s.	d.
To Expenditure in London—						
Directors' Fees, Secretary and General Office Expenses				484	2	10
To Balance of Interest				59	2	7
To Balance carried to "Profit and Loss Account"				7,289	9	8
				21,946	2	11
Cr.						
By net proceeds of produce sold in London—						
Coffee	7,067	12	7			
Tea	10,673	3	10			
Cinchona	3,024	18	6			
				20,765	14	11
By net proceeds of produce sold in Ceylon—						
Coffee	76	15	5			
Tea	112	1	9			
				188	17	2
By Commission on Sale of Produce, &c. ...				599	7	5
By Balance of Interest						
By Manufacturing other Tea				392	3	5
				21,946	2	11

Tea Extension Fund.

Dr.	£	s.	d.	£	s.	d.
To expenditure in Ceylon, in continuing the replanting and improvement of the Estate, and cultivation of land not in bearing :—						
Tea	£1,536	0	7			
Cinchona	80	18	9			
				1,616	19	4
To Balance carried to next account, as per Balance Sheet				1,199	12	5
				2,816	11	9

Balance Sheet, June 30th, 1890.

Dr.	£	s.	d.	£	s.	d.	£	s.	d.
To Capital Subscribed—									
2,208 A shares				22,080	0	0			
Bonus Capital—									
5,571 B shares	55,710	0	0						
811 C ,,	8,410	0	0						
				64,120	0	0			
							86,200	0	0
				86,200	0	0			
To Capital Unissued—									
1,792 A shares	17,920	0	0						
429 B ,,	4,290	0	0						
2,159 C ,,	21,590	0	0						
				43,800	0	0			
in all 13,000 shares. Total Capital				£130,000	0	0			
To Sundry Creditors—									
Acceptances outstanding ...				£7,115	8	3			
Accounts outstanding ...				259	7	0			
							7,374	15	3
,, "Profit and Loss Account"							4,661	5	3
,, "Tea Extension Fund," Balance from above Account							1,199	12	5
							£99,435	12	11

Cr.	£	s.	d.	£	s.	d.
By Prime Cost of estate ...	20,938	4	0			
,, Amount of Bonus Capital as per Contra	64,120	0	0			
Total Nominal Cost of estate				85,058	4	0
,, Factory and Machinery" as per last Balance Sheet	4,796	0	0			
,, Additions during the year	760	0	0			
	5,556	0	0			
Less Amount written off	1,560	0	0			
				3,996	0	0
By Cash at Bankers—						
Deposit and Current Accounts				6,759	10	8
,, Office Furniture				30	0	0
,, Produce in hand and in transit, 30th June, since realized at				3,574	0	2
,, Sundry Debtors				17	18	1
				£99,435	12	11

Fruit Culture.—There is an interesting paper in the *National Review* on "Fruit Culture in Worcestershire," by Mr. Parkinson, who mentions, among other interesting facts, that one earwig biting a hole into one apple may cause a whole roomful of stored fruit to go rotten.

CEYLON TEA IN EGYPT.

The *Egyptian Gazette* of 19th Nov. contains the following paragraph :—

We draw the attention of our readers to the advertisement of the Ceylon Tea Growers' Association for which Messrs. Edgar Kirby and Co. are the agents in Egypt, with Mr. Fleurent as sub-agent at Cairo and Mr. J. Slavick as sub-agent at Port Said. Ceylon tea has made its way of late years in public favour ; the Egyptian market has not been overlooked and the honour of being the pioneers of the Ceylon tea trade in Egypt belongs to Messrs. Edgar Kirby and Co.

The advertisement referred to is as follows :—

The Ceylon Tea Growers' Association, Colombo.

Sold in leaden packets of ½ lb. and 1 lb. Each packet bears a facsimile of the "Chief Brand" without which none is genuine.

Sub-Agents.

Cairo.—E. J. Fleurent, opposite the Credit Lyonnais.
Port Said.—Jas. Slavick.

Sole Agents for Egypt,

Edgar Kirby & Co., Maison Bolanachi, Alexandria.

N.B.—Seven one-pound packets of our best Ceylon Tea sent postage free to any part of Egypt.

Just below this advertisement appears another, as follows :—

Ceylon Cooperative Tea Gardens Co.

Thés de Ceylan Sans Mélange.

En paquets de 1 *lb.* enveloppés de plomb sur les terrains de récoltece à Ceylan, ou en boîtes de 10 *lb.*
Seuls agents à Alexandrie : Mellor & Co.
Do. au Caire : Walker & Co.

The more the merrier !

CINCHONA CULTIVATION IN JAVA.

Mr. van Romunde's report for the 3rd quarter of 1890 on the Java Government Cinchona Gardens states that the weather had been changeable, the east monsoon having been, as in 1889, very abnormal. The continuous rain on the Tangkoeban-prahoe had interfered with the growth of the plants. Stirring of the soil had been carried on vigorously during the quarter. A commencement was made with the planting of strips of land to form belts between the four establishments on the Malabar mountains. The caterpillar plague again gave great trouble, except in the closely planted gardens, and these were therefore cropped as little as possible. The crop of bark for the year was so far 250,000 half kilograms, of which at the end of September 177,369 pounds had been despatched to Tandjong Priok. At the sales in July and August in Amsterdam of bark of the 1889 crop, the average prices per half kilo and per unit of quinine sulphate were 8 and 9½ cents. On account of the want of dry weather in 1889, and excess of rain this year, the ledgeriana blossoming and fruiting was interfered with, and consequently the numerous orders for seed could not be executed. Sales of seed could not therefore take place before November and December.

Orange-Growing is now a considerable and increasing industry in some parts of California. And by last report of the British Vice-Consul at Los Angelos an orange orchard of ten acres there, in eight years from planting, will pay for all the outlay and leave the owner a profit of £490 or thereabouts. After that it will yield a return to the owner of not less than £1,000 per annum. Good suitable land with water-right can, he says, be bought at £60 to £70 an acre. The crop at Los Angelos, which last year reached 27,000 tons, will this year reach 35,000 tons.—*A. F. Press.*

PURE CEYLON TEAS *VS.* IMPURE TEA BINS AND "CLEANSING FIRES."

That the second is incompatible with the first goes without saying. Then how to keep the second *constantly pure* and without much trouble is the question. Mr. John Hughes, the Chemist, has already told us how to purify metal tea-pots—clean them well out with hot water and while the moisture still clings to their interior drop in a live coal and close the lid—the resultant steam will, in five minutes, thoroughly cleanse *metal* tea-pot. Carry the same idea out with regard to tea bins. Speedily sponge down the sides, then rapidly place on two bricks at the bottom a piece of iron, the size of half a brick, brought to white heat in the Sirocco, close down the lid and make airtight, and the virtue of "cleansing fires" is at once secured.—*Cor.*

THUNDERSTORMS.

ROBERT H. SCOTT, IN "LONGMAN'S MAGAZINE."

A flash of lightning a mile in length is nothing very extraordinary, and it is therefore not to be wondered at that experiments to bring electricity down from the clouds are very dangerous, and have frequently had fatal results. Soon after Franklin, in the last century, had made his famous experiment with a kite, and proved that electricity existed in a thunder-cloud, natural philosophers generally began to imitate him. One of them in St. Petersburg, a Professor Richmann, arranged in apparatus to collect this electricity. On the first occasion of a storm he went to his laboratory to observe the effects. A ball of fire was seen to leap from the apparatus to his head, and he fell lifeless. Having thus got some idea of the force exerted by lightning, it may be interesting to the reader to learn something as to the means we possess of guarding ourselves, or rather our houses, from injury. A flash of lightning really consists of a discharge between two objects, say two clouds, or a cloud and the earth, oppositely electrified, the charges on which suddenly combine, with the manifestation of light and heat. Lightning conductors are contrivances by which the electricity of the earth is allowed to escape quietly into the atmosphere, where it meets with electricity of the opposite character from the clouds, and the two neutralise each other quietly, without any explosive discharge, or, in other words, without lightning. I need not go back to the first principles of electrical science and explain why it is that electricity passes most easily through metals, and escapes with greater freedom from sharp points than from rounded knobs. Assuming these elementary facts, I may say that on any object, such as a house or other building, the electricity tends to accumulate itself on all projecting portions of the roof, &c., and especially on the highest points of it.

The ideal complete lightning-rod system would call for a sharp-pointed copper rod erected at each of these projecting pinnacles, and rising above it, and would then connect all of these separate points by copper rods, and eventually carry down a stout copper rod to the earth. Care must be taken that due attention is paid to certain main precautions:—(1) The point of the conductor must be kept sharp; (2) the section of the conducting-rod must be sufficient to allow the electricity to pass along it; (3) the rod must be perfectly continuous; and lastly (4), the rod must be efficiently connected with the ground. 1. The sharpness of the point is insured by gilding it or coating it with some metal which resists oxidation. 2. As to the section of the rod, a bar half an inch in diameter is sufficient for all ordinary buildings. Bars are not usually employed, as it is difficult to bend them over cornices, &c.; accordingly, either wire ropes or tapes are taken. The wire ropes are more liable to corrosion from wet getting in between the strands than are tapes, so that the latter are generally preferred. The metal used is always copper, being less oxidisable than iron, and being reasonably cheap and a very good conductor. 3. The continuity of the metallic connection from the highest point of the rod to the ground can only be secured by having as few joints as may be, and by making those joints as true and firm as possible by soldering. The joints should be examined from time to time, for it is often found, on examination of old conductors, that while the copper wire or tape is quite sound along its straight reaches, at the bends or joints corrosion has set in. As a chain is no stronger than its weakest link, a corroded conductor, such as has been described, is perfectly useless. 4. The earth connection.—It is not easy in all cases to insure that this is satisfactory. Electricity will not pass at all so easily into dry earth as into wet earth, and merely plunging the end of the rope or tape into wet earth is not sufficient. The conductor from the building should be soldered at its end to a large sheet of copper, say at least two square yards in area, buried in damp soil, or else soldered to the water or gas mains, so as to insure that a large surface of metal is in contact with damp earth.

Supposing that the whole system of protection against damage from lightning has been properly planned, the work should be carefully tested after its completion, because injury to it often occurs at the very last, owing to accidental causes, or to the carelessness of workmen. Conductors should also be examined from time to time, throughout their whole length, to make sure that all the joints are sound. Care should also be taken that the earth in which the terminating plate is buried is kept thoroughly moist. If any of these particulars be neglected, the conductor will be practically useless, and will afford no protection to the structure. The extreme practical importance of security against lightning must be my excuse for having been more diffuse over the object of lightning-conductors than over other details of the phenomena and effects of thunderstorms.—*Public Opinion.*

INDIAN TEA IN PARIS.

All who are interested in the progress of the tea industry in India will be pleased to hear of efforts being made to open new markets for the yearly increasing production of the country. The Indian tea planters too long neglected this work, but during the last few years they have been striving to make up lost ground. By far the most interesting and important of these undertakings is that which is being conducted in Paris. Paris is important as being not only the capital of France, but the centre of the world of fashion, although, in the interests of British tea-growers, we must regret that up to the present fashion has not set in favour of tea.

Under the auspices of this movement one of the first tea cafés in Paris has been opened at 12, Rue Auber, centrally situated near the Opera House, and it is certain that it will be a boon to those who love good tea, well made and served. In order to associate this new departure with the Indian Palace, the designs have been prepared by the same architect, Mr. Purdon Clarke, C.I.E., F.R.I.B.A., who is probably better qualified than any other man in Europe to show what can be done in the adaptation of Indian architecture to European requirements. The façade, an arcade of three entrances, is in the Mogul

style. It consists of a carved framework in Deodar filled with panels of highly decorated Indian glazed tiles. Above are two inscriptions in Hindustanee and the words "Au Palais Indien." The front of the interior is divided into two parts by an ornamental carved screen filled with lattice work. At the back is a spacious saloon. There is a separate entrance to each of the front divisions, one of which is used as a shop for selling dry tea, and the other as the tea restaurant. It is hoped that this will compare favourably with even the most handsome cafes in Paris. The Indian style is carried throughout. Opposite the partition mentioned above, there is an elaborately carved divan in a recess also filled with lattice work and carving. Between the front salon and the larger room behind are three beautiful Indian arches, both sides of which are covered with carving. The larger saloon represents the tent of an Indian prince; the walls and ceilings are draped with rich stuffs, and the light is softened by being admitted through three windows of stained glass. These windows recall those formerly existing in the old palace of Jeypur. In panels the names of the leading tea districts—Assam, Cachar, Sylhet, Dooars, Kangra, and Kumaon appear in striking colours. It will be felt that all this is a brilliant and appropriate setting for the Indian tea of excellent quality which is the only kind supplied. So far as we know this is the first shop or restaurant in Europe the decorations of which are exclusively Indian. As an example of how easily the rich art of country can be applied to European requirements we hope the restaurent may be popular with many who are not so deeply interested in the tea question.—*Times of India*, Nov. 5th.

WYNAAD PLANTING NOTES.

Like Mr. Micawber, we are beginning to hope that "something is going to turn up," for the weather has been so extraordinary and so unusual, that we can only suppose (according to your "Native Observer") that the Shastras must have predicted it. Perhaps he can also tell us what results are to be expected! Continual downpours have kept the country as green and luxuriant as in mid-monsoon; plants, which are usually withering by now, have again sprouted up in fresh life. There is a rush of new wood on the coffee trees, and spike is showing up. We heard unmoved, of cinchona clearings being planted up during the last week in October; and those who were shaving (trees) experienced phases of despair, only to be understood by the spectacle of heaps of bark becoming "discolored," for lack of sunshine to dry it properly. But during the last few days there has been a delightful change, and we are having bright days and cool crisp mornings and evenings, without the usual accompaniment of east winds. It is great relief to us; for we began to dread a renewal of the leaf disease from continuous wet. Our coffee is, as usual, looking "splendid for next year." It should console us for the wretched disappointment of the present crop, to notice that an idle season has apparently invigorated the trees very markedly. Fields which a few months ago seemed fit, only to abandon, have burst out again in a splendid show of new wood and leaf. If only we could feel sure of seasonable blossoming showers, we might be eased of a great load of anxiety, for the trees give every promise of a fine crop in '91. Over that of '90 we may draw a melancholy veil. With most of us, even our lowest estimates have been reduced, and "reduction" in everything else, is the alarming result—*alarming*, because coffee now-a-days must be coddled—or go out,—so that it is after all but a doubtful economy to cut down, absolutely, necessary expenses. The lowness generally affects our labour. Crop is nearly over in most places already, and it is very difficult to employ the usual gangs. The labour question has been an unpleasant one all this year. Our coolies (heavily advanced of course) should have been in during the latter end of May, but very few arrived before August, and many are only now putting in an appearance. Consequently we had to struggle through our weeding and planting, with any gangs we could get from the coast, and our Lordly Canarese complain, because, "they've got no work to do," and threaten to take contracts in other districts, oblivious, seemingly, of what they still owe us. * * * The ambona disease still continues in places, but has not destroyed all faith in the product. New clearings have been opened in the district for ledgers, and a great deal of Liberian coffee, and pepper has also been planted. The pepper crop does not seem to be particularly good this year. Let us hope that it, as well as coffee, meditates doing us a good turn in the coming season. I think we deserve it.—*Madras Times*, Nov. 22nd.

NOTES ON ESSENTIAL OILS.

(*From Messrs. Schimmel & Co.'s Report*)

EUCALYPTUS OIL.—The production of eucalyptus oil in Algeria, which only amounts to about 2,000 kilos a year, is said to be capable of considerable extension, and even at the low prices it must be a very lucrative industry, if one may judge from the experiments which have been made in Leipzig with French material, the price of which was greatly enhanced by the enormous rate of railway carriage. It is also said that in Algeria the cultivation of *Eucalyptus rostrata* is steadily gaining ground, although this species is of slight value only for the manufacture of oil. Oil of this variety has not hitherto been known in commerce. With reference to an observation by Mr. P. W. Squire, in the *Chemist and Druggist* that an oil has frequently been met with in commerce lately which was offered as *Eucalyptus Amygdalina*, but which contained no phellandrene, and was dextrogyre instead of levogyre to polarised light, we have ourselves noticed that the oil bought direct from Australia recently contained only a small percentage of phellandren and was weakly dextrogyre. We are of opinion that the leaves of different varieties of eucalyptus are no longer kept carefully separated in Australia during the distilling operation, and that consequently the names under which the oils are brought into commerce do not always correspond with their origin. On the occasion of the recent Berlin Congress three new varieties of eucalyptus oils distilled by us were exhibited. These oils are not yet found in commerce, but one or the other of them is about to make its appearance. These oils are the distillates of *E. dealbata*, *E. maculata*, and *E. maculata* var. *citriodora*, all of them of a fine melissa-like flavour. In the meantime large samples of distilled oil of *E. maculata* var. *citriodora* have been received from Queensland. This oil has been distilled by Mr. Jeffreys Timbury. Not only does its flavour agree with that of our distillate, but its other properties also are so much akin to it that there is no doubt of the identity of its origin. Its s.g. at 15° is 0 873; about three-fourths of it has a boiling point of 205° to 210°, small quantities vapourising somewhat below or above this temperature. The fraction having a boiling point of 205° to 210° consists of almost chemically pure citronellon. Upon agitating the oil with a solution of bisulphite of soda the mixture becomes strongly heated and forms a fairly hard mass, from which, after washing with ether and decomposing with a solution of soda, pure citronellon separates. The parts of a lower boiling-point than 200° (about 4 per cent. of the whole) showed none of the characteristic reactions of cineol (eucalyptol), and it may therefore be taken for granted that this body is wanting in the oil of *E. maculata* var. *citriodora*. The thoroughly rectified oil is colourless, has a pleasant flavour of melissa, and, presuming the price not to be too high, will be useful in perfumery and soap-making. Unfortunately, we are quite in the dark as to the price, and therefore will scarcely be possible to make any sales until April next year. There is no doubt that the oil has a very much finer flavour than citronella oil, and if its price should lie between 2s 6d and 3s 6d per lb. it may find a considerable employment; if it is dearer however, it will only be used on a smaller scale. [In January of this year we had a communication from our Melbourne office regarding this oil, in which it

is stated that "the leaves are carefully separated from the young shoots, and the oil distilled from them alone. In its own district it is being used as a substitute for globulus oil for medicinal purposes. Oil distilled from the older leaves not separated from the stalks Mr. Timbury calls 'commercial oil' of *E. citriodora*, and sells it at 3*l* per gallon. The purer oil is put up for retail sale in bottles, sold wholesale as follows:—½ oz. 9s; 1 oz. 15s; 2oz. 28s 4oz. 48s per dozen, pint bottles, 20s each. Mr. Timbury states that the oil is a powerful disinfectant and deodorant, even the aqueous solution deodorising the most offensive matter. The yield from a ton of moderately dry leaves is about 520 oz. of oil, from fresh leaves about 270 oz. There is only one other lemon-scented eucalyptus." It would appear from this that there is little hope of the oil coming down to 2s 6d or 3s 6d per lb. We may also recall the fact here, which we stated as long ago as May, 1886, that the leaves of old and young trees alike of *E. amygdalina* and several varieties thereof, as well as the leaves of other species, are gathered by the bushmen collectors, who have no botanical knowledge; hence there arises considerable variation in the physical properties of the different brands of Australian *E. amygdalina* oil. —ED. C. *and D.*]—*Chemist and Druggist.*

A VEGETABLE CONDUCTOR OF ELECTRICITY.

Some very interesting letters and notes have recently been appearing in *Reis and Rayyet*, a very smartly-conducted Calcutta paper, in reference to an old and curious custom of the Hindus of Bengal. It seems that from time immemorial it has been the custom of the Hindoos to place on the roofs of their houses a plant, the identity of which appears to be disputed among Indian botanists, some calling it a Cactus, whilst others declare it to be a Euphorbia. One of the correspondents is quite mistaken when he says that the Cactus—which we will assume the plant to be—helps to draw the electric fluid into the house by the attraction of the electricity in the cloud above, whether there be a Cactus plant or not. The Cactus only serves to scatter the electricity of the house into space, and thereby to neutralise that of the clouds, for these two electricities are of two kinds. The Bengalee name of the plant grown on the roof is *bâj-bâran*, *i.e.*, a preventative of lightning—a fact which conclusively proves that the Hindoos are acquainted with the useful property of this sort of plant. It is not at all improbable that the ancient Hindoos, who displayed so much learning in other matters, should have been acquainted with the principles of electricity; the explanation is now lost, but the custom remains. An absurd, an idiotic reason is given in Hunter's *Dictionary*, in which it is seriously stated that because the Cactus protects their grounds from stray cows and goats, it will also similarly protect their houses from lightning: the idea is preposterous.

The custom of placing a Cactus on the roof is based on a highly scientific principle, viz., that of the "power of points." Electricity escapes far more easily through a pointed conductor than through a round one. For this reason the end of the brass conductors in an electric machine are mounted with brass knobs. The principle of saving a house from lightning with a metallic-pointed conductor and with a prickly Cactus is the same. When a cloud highly charged with electricty passes over a house, the house becomes charged with electricty of an opposite kind through induction, and these two electricities attract each other. Lightning is only the result of this mutual attraction, when a portion of the electricity of the cloud attracted by that of the earth below strikes the house. But if the house is provided with something having points, the electricty of the earth escapes into the air through these points, and neutralises the electricty of the cloud and thus the discharge cannot take place. The plant which the Bengalee and other Hindoos grow on the roofs of their houses has hundreds of sharp-pointed prickles. The more the number of points a conductor charged with electricity has, the more easily the electrical fluid escapes from it. Therefore, in this respect, the plant in question is far better than an ordinary conductor which has only one point. Now-a-days, the conductor of a house is provided with four or five points. The great drawback in the use of the Cactus is that it cannot have proper connection with the earth; the connection is chiefly through bad conductors. Still, something is better than nothing.

The subject is one of considerable general interest, and deserves careful investigation and enquiry. The custom does not appear to be observed in Upper India, but in Bengal it is a very common thing to see this plant in a tub placed on the house-top. This plant is not only held sacred, but is reputed to possess important medicinal properties.

The editor of *Reis and Royyet* states that the plant used on the housetops is not the Indian Cactus so suggestive of the hooded serpent, and appropriately called Nagphani, in Bengal, and Nagkali, on the Coromandel coast. That plant, though common enough, is neither sacred, nor, so far as we know, used as a medicine against snakes in this province.

The plant prized as a protection from lightning is the Tekátá,sij. It is not a Cactus but a Euphorbia. The subject is certainly one in which more light is needed. —A TRAVELLING BOTANIST.—*Gardeners' Chronicle.*

ON THE USES OF CURRY LEAVES.

BY DR. P. S. MOOTOOSWAMY, F.L.S., TANJORE.

The curry leaf tree (*Murraya Kœnigii*, Spreng), belongs to the natural order Rutaceæ, and is remarkable for its fragrancy. It is a small tree with pinnate leaves, leaflets alternate, ovate, somewhat serrated, panicles corymbiform, terminal, calyx 5-cleft; petals, 5, spreading; berry 1-celled, 1-seeded; flowers small and white, appearing in the hot weather. The tree is well-known throughout the plains of Southern India, where it grows in the jungles on the lower and mountainous slopes. It is also cultivated in gardens on account of its leaves, which are very fragrant and much used by natives for seasoning their curries. Some gardeners make their living by the daily sale of the fresh leaves, and coravars, a class of wandering dealers, bring the dried leaves, with those of *Solanum pubescens*, from the jungles and take them for sale from place to place. The vernacular names of the tree allude to it as "curry leaf" because of its use as a condiment, and in Sanskrit it is called the "fragrant neem," and other one or other of these names it is known throughout India, Burma, and Ceylon.

The leaves are the only part of the tree, in this part of the country, employed in native medicine, and their properties are aromatic, stomachic, stimulant, astringent and tonic. They retain their medicinal properties even in their dried state. The leaves are indispensable in seasoning native curries, broths, and pepper water for their daily consumption. It enters as a principal ingredient in their curry-stuff or condiment taken with the rice. In the absence of fresh leaves, dried leaves are purchased and stocked for the cold season. A seasoning preparation, called *vadagam* in Tamil, is made and kept for daily use in almost every house, except those of Brahmins, who do not use onions in their diet. It consist of onions in large quantity, while the other ingredients form smaller proportions. These are galic, cumin, fœnugreek, mustard, turmeric, and curry leaves. These are well beaten down in a stone mortar and made into a mass, from this a number of large balls are rolled up and dried in the sun. They are smeared with castor oil every morning as they are exposed, and after a few days will become dry enough to store. Curry leaves are also used for flavouring chutneys.

Persons suffering from dyspepsia and diarrhœa resulting from indigestion, make a broth from the leaves. They are first broiled with ghee, and after the addition of a little tamarind and salt, water is added,

and the whole boiled. I have found this decoction check the complaint at once.

A useful preparation for allaying vomiting and purging in children is the following. Curry leaves, tamarind, neem, country gooseberry, morinda, of each one ounce, sweet flag and ajwain, of each one drachm, water t n ounces. The dose of this is half an ounce twice a day.

The green leaves rubbed up to a paste and mixed with buffalo's tyre (butter-milk) have been given with success in adult dysenteric cases. The dried leaves enter into a compound powder largely used as an astringent. The seven articles are as follows, with their botanical, English, and Tamil names.

Murraya Kœnigii	Curry leaves dried	Karuvepillai.
Mangifera Indica	Mango seeds	Manga palavirai.
Solanum pubescens	—	Soonday kavathu.
Trigonella Fœnum-græcum	Fœnugreek	Vendayam.
Phyllanthus Emblica	Country gooseberry	Nelli-kai.
Feronia elephantum	Wood apple	Velampalam.
Carum copticum	Omum	Omum.

Equal parts of these drugs are finely powdered separately and then mixed. The dose for children is 3 to 5 grains in honey, and for adults 15 to 30 grains in buffalo's tyre. This powder is much resorted to by native physicians in the treatment of dyspetic diarrhœa of children attended with flatulency. It is very singular that native doctors, ignorant as they are of the therapeutic action of medicine, never combine opium or other narcotic preparation in their administration of remedies in diseases of children.

Dr. Roxburgh mentions that the bark and root of the plant under reference are applied externally to cure eruptions and the wounds made by the bites of animals. A decoction of the leaves is used in fever mixtures, mixed with other aromatics and bitters.

A clear transparent yellow oil is sometimes extracted from the seeds and is known as Simaboolee oil.

A chemical examination of the leaves has been made by Mr. J. G. Prebble, and will be found in the *Pharmacographia Indica*, vol. i., p. 263-265. From the analysis it appears that the leaves yield to distillations a small quantity of volatile oil resembling that obtained from the leaves of *Œgle Marmelos*. Ether extracted $7\frac{1}{2}$ p r cent. of resinous matter, and a further quantity was removed by alcohol. The resin was greenish black in colour, amorphous, and freely soluble in chloroform, bisulphide of carbon, benzol and amylic alcohol, less soluble in glacial acetic acid, and petroleum ether, and almost insolube in ecetic ether. It gave an emerald green coloration with sulphuric acid, and yielded picric acid when oxidized by nitric acid. The aqueous solutions of the ethereal and alcoholic extracts contained an acid principle darkened by iron salts, but not precipitated by gelatine. The bitterness of the leaves is due to a glucoside provisionally named *Kœnigin*. The crystals were sparingly soluble in water and alcohol, and the solution was precipitated by tannin lead acetate, and fenoso-ferric salt, but not by alkaloidal reagents.—*Pharmaceutical Journal*.

BRITISH GROWN TEA.

TO THE EDITOR OF THE "MANCHESTER COURIER."

Sir,—It is said, and truly said, of a great living orator, that he made statistics eloquent. He so well understood and so dexterously employed the fine art of language that the humdrum figures of a Budget were bright and fresh and full of pleasant surprises. We wish we knew the secret of making attractive the figures which, with your kind permission, we would lay before your numerous readers. To bespeak their interest in our statistics we would state by way of introduction that these figures claim attention, because they affect the reader's pocket. They also touch another equally susceptible spot—the palate, and they also appeal to his patriotism. As the last remark may excite surprise, we at once explain. It is the object of these figures to show to what a large extent the British tea drinker has already deserted China, to confirm him in that course, to urge him to deal another blow at that collapsing trade; to show that by a continuance of this preference for Indian and Ceylon teas he will be immensely assisting his countrymen, who are tea planting and tea farming in those great dependencies. That's where the patriotism comes in. Support your colonial fellow-countrymen, who on the hillsides of Assam and the Chingalese valleys are bringing science and method to bear—as well as compromising their livers—in order to send you tea which, as many British housewives are fully aware, is not only superior in flavour to China tea, but keeps its flavour much better. The almond-eyed Ah Sin does not send you his best tea. He never did. He has always used at home far better tea than he sells us. Thanks to our Auglo-Indian planters, John Chinaman's best is now more than equalled by Indian tea at less money. The China tea grower is in a bad way. He finds himself implacably thrust aside. Stung by the thought of a ruined industry, he promises to mend his ways. Trust him not. He will fool you again if you give him the chance. Now for the figures:—In 1838, for the first time, this country received more tea from India and Ceylon than from China. Go back 35 years to 1854. The quantity of China tea used in Great Britain was nearly 62,000,000 pounds, and the quantity of China tea used in 1889 in Great Britain was just over 61,000,000 lb. In 1854 however, the 62,000,000 lb. represented our total consumption, as China was our sole source of supply. But in 1889 we used 185,000,000 lb., of which India supplied 96,000,000 lb., and Ceylon 28,000,000 lb. Or to put it in another form. Of this 185,000,000 lb. consumed in 1889, India supplied 52 per cent, Ceylon 15 per cent, and China only 33 per cent. The first six months of 1890, 1st January to 30th June, show a further decline of China tea, a further increase in consumption of British grown tea, the figures being—Indian 54 per cent, Ceylon 16 per cent, and China only 30 p r cent. The exports from China this season to October 30th are more than 25 per cent less than in 1889. The quantity of tea used annually per head of population in Great Britain shows the following increase: 1849, 1·81; 1859, 2·67; 1869, 3·63; 1879, 4·68; 1889, 4·91. Note how small is the increase in total consumption during the 10 years 1879-89 when compared with the preceding decades. Indeed it is calculated that during the last seven years the average consumption per head of population has remained stationary. This fact is naturally regarded with rueful eyes by Chancellors of the Exchequer, but it admits of a simple and satisfactory explanation. There is no decline in the demand for tea. This would be abundantly demonstrated if the number of gallons or cups of tea could be ascertained as easily as the weight of tea. Indian and Ceylon being so much stronger than China tea a greater number of cups can be made from the same weight of tea. Indian tea more especially possesses that quality quaintly described by an old Irishwoman as "taking a powerful grip of the second wather." The secret then of the enormous and yearly increasing popularity of the Indian tea may be found in its economy, in its absolute purity, and its exquisite flavour. It is also free from those deleterious qualities which sometimes produce so unpleasant an effect after drinking China tea. People find that instead of using the same quantity for a brew that they would of China tea, half the quantity is sometimes more than sufficient. It has been calculated that the British public, while consuming a larger number of gallons of tea in 1888, saved in that year £1,000,000 through using Indian tea instead of the weaker and less carefully cultivated article. In China tea culture has become desultory, careless, unscientific. In India tea is better grown, better manufactured, and vigilance, method, science, are having their natural reward. It is true that having fairly distanced China as a competitor, some complaints have arisen that the Indian tea industry is not at the moment so promising

as it at one time appeared. The gardens are as prolific as ever, the labour supply is improved, the demand is increasing every year, but Ceylon tea is so treacherously good that some Himalayan planters have feared that the competition of that favoured island is going to some extent to rub the gilt off the gingerbread. But an analysis of the balance sheets issued by 24 of the more prominent concerns shows that they yielded an average of nearly 7 per cent on the invested capital, and 17 out of the 24 concerns have reserve funds saved out of past profits, which aggregate more than their paid up capital. Not at all bad as times go, and if the Indian tea industry never does worse, the planters will have little cause to complain. Of Ceylon and its miraculous climate and bounteous soil all travellers speak with enthusiasm. It has been held by some to be the Roman Taprobane referred to by Milton in the great vision of Roman power in "Paradise Regained."

From India and the golden Chersonese,
And utmost Indian isle Taprobane:
Dusk faces with white silken turbans wreathed.

By others it is considered to be the local representative of the Paradise of Scripture. If not, travellers say it at least ought to have been, as no place on earth better supports the Paradisaical characters. And then does not Ceylon boast her "Adam's Peak"—named after the universal progenitor—a mountain more than 7,000 feet high, which, however, ranks only fifth or sixth in the mountain scale, the highest being over 8,000 feet above the sea level The dimensions of this Eden of the terraqueous globe are about one-sixth less than Ireland. Scotland also affords a scale of comparison; Scotland containing a trifle more than 30,000 square miles and Ceylon 24,500. Great already in performance, Ceylon is still greater in what she promises, and well merits the admiration of those ardent travellers who describe her as the most gorgeous jewel in the imperial crown.—Yours, &c.,

BROOKE, BOND & Co.

17, Piccadilly, Manchester, November 7th, 1890.
—*Manchester Courier.*

THE ASIATIC QUESTION IN MAURITIUS AND NATAL.

The *Natal Mercury* is afraid of that colony being overrun with "Hindus" to the same extent as Mauritius. Here is an extract from a recent editorial:—

We find in the *Commercial Gazette*, of Mauritius, of September 30th, an article that deserves the serious attention of all who are interested in what is known as the "Asiatic question." Mauritius, it must be remembered, is an island that cannot be said to have had any aboriginal population. Its people are either immigrants or the descendants of immigrants. They are the offspring of European occupation, and are only "native" in the sense that whether they be white or coloured they have for so many generations, as the case may be, been born on the soil. Thirty years ago the population of the island was represented by the European creoles—mostly of French extraction—by a few British merchants and planters—the two classes forming the aristocracy of the community—and by a much larger proportion of Asiatics from India and China, who represented the "lower" and labouring classes. At that time the island presented a picture of sugar plantations, owned by European colonists and worked by coolie labourers, with a moderate admixture of colonial creoles, and in the towns and villages of small "Malabar" and Chinese traders. A large breadth of the soil was still covered by forests that added to the beauty of the landscape and tempered the conditions of the climate. There had been occasional epidemics of cholera; but as a rule the health of the island was fairly good; the fever period only made its appearance in 1864. Little by little since then the Asiatic element has more and more taken possession of the soil, and fever has more and more established itself in the community.

Now we find a journal fairly representative of public opinion in a colony whose only industry has been developed by means of Indian labour, deliberately proposing that the supply of that labour shall be arrested, as a measure of sanitary and social salvation. Which may be the "neighbouring colony" from which it is proposed in future to draw the stream of immigration we are not told, nor does it matter. Mauritius, as we have said, has no vast reservoirs of native population to draw upon, and the proposition, therefore, as compared with our own case is all the more striking and suggestive. Such an experience and example cannot possibly be ignored. The Indian population of Mauritius—an island of some 713 square miles—numbers, say, 317,121. It has overrun and swamped the island. It has denuded it of trees; it has corrupted the climate, and it has driven out European trade from the hands of all but a few wholesale firms; in other words, it has converted a European colony into an Asiatic settlement. These are startling and ominous facts, and they ought to command the gravest attention of our legislators Mauritius is witnessing the full fruition of evils of which we already see and feel the beginning in Natal.

THE PERFECTION OF CLIMATE IN AMERICA.

From an American friend, a merchant—who has hitherto been settled in Philadelphia, we have the following under date 3rd November:—"Last winter my wife's lungs seemed ailing and we spent the cold months in the south. The change had a beneficial effect, but our doctor here thought the splendid climate and high altitude of Colorado was needed, so we spent the summer there. I think my better half has scarcely a trace of lung weakness today, and we enjoyed Colorado Springs so much that we are going to settle there permanently. I have been much in Virginia, and have travelled extensively (elsewhere) in this country, but have never seen such a climate as that of Colorado, nor so charming a place for residence as Colorado Springs."

THE CULTIVATION OF THE COCA PLANT, and the manufacture therefrom of the drug known as hydrochlorate of cocaine, is to be tried as an experiment at the Government cinchona plantations in Bengal. The suggestion that it might be advisable to attempt the manufacture of this valuable and costly drug in this country, came some months ago from the authorities at the India Office.—*Bombay Gazette.*

TECHNICAL EDUCATION IN INDIA.—One of the most admirable features in the scheme of technical education worked out by Mr. Mackenzie in the Central Provinces, is the prominence given to instruction in the principles of agriculture. For this purpose, as we noted some time ago, a primer for use in primary schools was recently drawn up by the Director of the Agricultural Department, and it has now been determined to make instruction in this handbook compulsory in all rural schools. Already the Inspector-General of Education reports that the subject is very popular both with the pupils in these schools and with school committees in rural tracts. The great difficulty is to provide teachers who can impart the lessons of the primer in the vernacular, which is obviously the only medium by which the classes in the rural schools can be reached. For this purpose a vernacular class for teachers will now be added to the English agricultural class at Nagpur; an additional teacher with a diploma from the Poona College of Science will be employed for the purpose of giving to selected masters from the village schools a course of practical instruction in the primer through the medium of the vernacular; and, finally, small scholarships will be provided for the teachers so selected, so that two may be sent in from each district half-yearly for a six months' course at Napgur.—*Pioneer.*

RUBIES AND SAPPHIRES IN SIAM.

We (*Bangkok Times*) hear from London that the Rubies and Sapphires of Siam Company have appointed a Mr. Gibbons as their general agent in this country and that he has already started for Bangkok. Mr. Gibbons, it is said, will also act as local agent for the Gold Fields of Siam, Ltd. From a reliable quarter we hear that the Rubies Company has been satisfactorily floated in London with a capital of $300 000, and that from the preliminary arrangements already made at Krat and Chantaboon, the shareholders will probably make a good thing out of it.

MAURITIUS.

PORT LOUIS, Nov. 8th.—SUGAR, THE WEATHER AND THE CROP:—The season is very favourable for manipulation, and the mills are working with great activity. In certain quarters the yield is far superior to that of last year, whereas in others, the contrary is the case. We believe that we are in a position today to predict that the general production will be below that of last crop.

VANILLA.—There has been a good demand for fine qualities. We have to quote the sale of a few lots first quality at R16 to R17 per kilo above 6 inches 2nd quality at R14 to R15 per kilo above 6 inches. We fully confirm our valuations as regards the outturn of the coming crop which will not exceed 14,000 kilos.

ALOE FIBRE.—Remain nominally quoted from R240 to R250 the ton for first qualities. But very few factories continue at work.

COFFEE.—Owing to successive arrivals, market for this article closes dull and good quality of Ceylon is selling at R56 to R60 per 50 kilos. Réunion may be quoted nominally at R60 and mixed triage qualities R35 to R50 per 50 kilos, according to quality.—*Merchants and Planters Gazette.*

CARP FISH FOR, AND IN, CEYLON.

Mr. W. R. Tringham of Nuwara Eliya, deputed by the Assistant Government Agent, came down to Colombo on a special mission to meet the S. S. "Ma'da" and take charge of a consignment of Carp ova of a new species sent from Madras—the Nilgherries doubtless. But when Mr. Tringham got on board, it was to find that all were dead, to judge by the putrid stinking water in the receptacles. Had they been in order this consignment was to be taken to the lakelet in the Pavilion ground, Kandy.

However, Mr Tringham's trip to Colombo was not quite wasted, for he brought down with him some lively specimens of our Ceylon Carp to place in the fountain basins in Gordon Gardens. This has been done successfully; but today Mr. Tringham found one of them had been attacked and damaged considerably, possibly by a crab. However the others seem all right.

THE JAMAICA BLUE BOOK.

THE GOVERNOR'S MINUTE ON THE DEPARTMENTAL REPORTS.

We (Jamaica *Gleaner*) have received the Departmental Reports of the Colony for the year 1888-89. In summing up his report on these, His Excellency the Governor remarks:—

The year 1887-88 marks the end of a period of depression. It opened with a deficit in Public Revenue of £12,628 and closed with a surplus of £30 054. This surplus had increased by the end of the year under review to £56,538. The growth of prosperity thus indicated has been maintained, and promises to continue. The preceding précis of the reports of the various Departments, which treat in detail of the different subjects under which the business of the Island is classed show how steady an improvement is maintained in every Department. The number of Schools has increased from 771 in 1888 to 826, and Industrial Schools are about to be erected, at Hope Botanical Gardens for boys, and at Shortwood Female Training College for girls. The establishment of these schools will obviate the necessity of sending more waifs and strays to be brought up in the Boys or Girls Reformatories where they are exposed to the contaminating effects of association with vicious and criminal children. The Government Savings Bank shows an increase of 185 in the number of Depositors, and of £14,963 in the total amount of deposits.

THE FRUIT TRADE AND THE ABANDONMENT OF SUGAR.—The fruit trade, especially that in bananas, is daily expanding and to meet the wants of the local growers the telegraph system is being rapidly extended. The cultivation of sugar shows a decrease as steady as that of bananas shows an increase, and there seems every probability that the cultivation may be further restricted. The cause of the abandonment of the estates is attributed to the low price of sugar, and in some cases to the difficulty of obtaining labour. No doubt heavily incumbered sugar estates belonging to absentee owners do not pay under the present system of cultivation of the canes and manufacture of sugar and rum. But with the separation of the business of manufacture from that of cultivation, and the concentration of the planters' attention on the improvement in the cultivation, and the quality of the cane, sugar growing would be a safe and profitable investment. It is much to be regretted that the cultivation of sugar estates should decrease for the sugar cane, unlike the banana, cannot be destroyed by a hurricane, and this offers a steady field for labour in the event of such a calamity. The difficulty of obtaining labour is no doubt serious. That there is difficulty is not to be attributed to the laziness of the population but rather to their determination to invest in land, and to work upon it for their own profit. The consequence of this determination is a gradual migration from the plains to the hills, where land can more readily be secured, and where a very thriving peasant proprietary has sprung into existence, and these owners have become the principal producers of fruit.

THE CAPABILITIES OF THE ISLAND.—But however satisfactory are the statistics of the Blue Book, they can give no idea of the value of Jamaica as a whole or of the extreme beauty and great capabilities of the Island. Of the area of 4,193 square miles, but 646 square miles are flat. The remainder is mountainous, and in the East the Blue Mountains attain the height of 7,000 feet. The mountains are composed of white and yellow limestone, carbonaceous shales, granitic and conglomerate rocks, with alluvial valleys. The climate is particularly healthy if ordinary precautions necessary in the tropics are observed, and while in the mountainous interior the temperature ranges from 60 deg. to 75 deg., even the tropical temperature of 80 deg. to 85 deg. near the sea level, is assuaged by the sea breeze during the day, and the cool land breeze that at night flows down from the hills.

With such variety of temperature, aspect and soil, the range of production is very wide and the Island offers excellent investments for agriculturists with comparatively small capital.

COCONUTS AND CINNAMON IN CEYLON.

KADIRANA, Dec. 6th.—Nice showers since the 1st, and promise of more; a little over 2 inches have fallen already this month. Almost before one bud on the cinnamon bushes has matured, another has made its appearance, and promises to be a pretty heavy one. This is rather rough upon those who waited till the first bud matured before commencing peeling; while those who worked through the bud have scored. Coconut crops continue to be good, but next year must see a great falling-off in yield. Mr. J. D'S. Raja-

pakse, Shroff Mudaliyar of the Negombo Kachcheri has become tho lessee of Mr. Tudor Rajapakse's cinnamon properties in this district at, I believe, R6,000 per annum.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &C. EDITOR OF "SCIENCE GOSSIP."

Messrs. Carter, the well known English seed merchants, have raised a new kind of barley, with branched spikes, resembling the Egyptian wheat one sees in old Biblical pictures. Now, a branched barley, with a short stout haulm to support it, might turn out a wonderful result to the grower. We want some young agriculturist to back his own opinion, and go in for trying a few acres of it. He might select the best seeds from the best plants, and sow them for results. If he succeeded, he would make money—if he didn't he would be no worse off than if the mildew had destroyed his crop. This branched barley was raised from a "freak;" and there is no reason why many "freaks," should not be utilised. A Massachusetts farmer had several lambs born, with short, stumpy legs. His flocks had legs too long, as a rule, for they were all over the country, like so many greyhounds. Fences could not keep them in, and they caused both a good deal of trouble and a great deal of blasphemy. So the cute Yankee breeder saw his chance. He bred from the short, stumpy-legged sheep that could not possibly wander; and in this way was raised the now celebrated breed of "Ancona sheep."

The United States Government have established at Washington a hospital for diseased plants. It differs from oridiuary hospitals in this respect—that the injuries and disorders from which the vegetable patients suffer are purposely inflicted on them by the doctors of the establishment, in order that the nature of their complaints may bo studied, and methods for curing them may be discovered. It is under the well-known Department of Agriculture, which has agents in all parts of the States, whose business it is to collect specimens of diseased plants, and to forward them to this Vegetable Hospital. It is now known that nearly all the diseases of plants are caused by parasites, of which nearly fifty thousand different kinds are recognised. The parasites are carefully studied, and are developed in a gelatine culture. Healthy plants are then inoculated with them, and the progress of their various diseases is in this manner carefully studied. By this process, Professor Gallagher, who is at the head of the laboratory, has found it possible to throughly understand and cope with 12 different diseases of the grape-vine alone. A cure has also been found for the "fire rot," which turns the limbs of pear trees black, and rots them quickly. It is stated that the professor has similarly found means of attacking and routing the fungoid parasite which causes the potato disease.

The following is a capital recipe for naturalists who collect:—To preserve the colours, shapes, &c., of tropical fishes, corals, sea anemones, jelly-fishes, &c., make a mixture to suit of glycerine and gum. Both are mixable with alcohol, but care is required in the operatioo.—*Australasian.*

THE LANKA PLANTATIONS COMPANY.

There is no Plantation Company connected with this island whose Directors afford such full and detailed information to their shareholders and the general public as do those of the Lanka Company. We have been favoured with a copy of their latest Report which will be found in another column, and which proves no exception to the excellent practice hitherto observed. This Report is well worthy of attention from all who take an intelligent interest in the great planting enterprise of tthe Colony. The Lanka Co. has had an unusually rying experience, because its existence is coinciden with the decline and fall of the coffee production of the island. No one at the time the Company came into existence believed that the splendid properties taken up on its behalf, could have suffered as they have done, and that too, notwithstanding the most careful supervision and liberal cultivation. Again, the Directors, naturally enough under the circumstances, refrained from launching into "tea" so early as they might have done, and as we know was urged on them from this end. Indeed, their then Ceylon Manager who devoted himself to the interests of the Company in the most earnest, indefatigable way, was able to place within the Directors' offer, at an early stage in our tea history, some splendid bargains in tea—notably a well-known Dolosbage estate then in the market for R25,000—but Ceylon tea planting was scarcely regarded in London at that time as beyond the stage of a speculative enterprise and with all their trying experience of coffee and cinchona, it is no wonder that the Lanka Directors were chary of another bold venture. Now, however, that the tide has turned for our planting enterprise, the Lanka Company holds an exceptionally strong position with no less than 1,468 acres under tea, 980 still remaining of good coffee, and 371 acres of very valuable cacao which last yielded a crop considerably above the estimate in the season reported, so making up a considerable proportion of the receipts. In respect of coffee, it is worthy of note and as shewing the hard luck in every way of earlier years, that while for 4,991 cwt. sold in 1881-2, only £16,000 was got, for one-third that quantity—or 1,649 cwt.—in 1889-90, no less than £8,145 was obtained. In other words the average price netted for our old staple has risen nearly fifty per cent in eight years. We may hope then that in every sense the corner has been turned, and that both as regards crops and prices, a good time is before the Lanka Plantations Company. The Directors and shareholders undoubtedly deserve well of Ceylon, and we trust the dividend declared on the present occasion is but the harbinger of returns which will more than make up for all past losses. *Floreat Lanka!*

THE FALL OF 14·47 INCHES IN 4 HOURS IN MEDAMAHANUWARA CONFIRMED.

HAS IT EVER BEEN EXCEEDED?

Rangala, 9th Dec.—Please tell your Koslanda correspondent that the 14·47 inches of rain really fell in Medamahanuwara in 4 hours (no practical jokes, &c.) and was correctly measured, being confirmed by two adjoining estates, one superintendent measuring 12·62 and the other found his gauge full at 11 inches. Had this gauge been large enough I expect it would have shown a heavier fall even than 14·47, as it generally gets the heaviest rainfall in the district.

[The greatest fall recorded for Colombo is 11·90 inches in 24 hours on 4th-5th May 1876; and for upcountry, but also for 24 hours, 18·80 inches at Padupolla. We suppose, therefore, this fall at Medamahanuwara to be unique in our meteorological records?—ED. *T. A.*]

COFFEE IN WYNAAD: THE OLD STORY.

We hear very unfavourable accounts of the outturn of coffee in Wynaad. Estimates formed when the blossom had set, have turned out most disappointing; instead of so many tons only as many bushels have been picked.—*S. of I. Observer,* Nov. 29th,

THE LANKA PLANTATIONS COMPANY, LIMITED.

Directors:—George Allen, Esq., Sir R. P. Harding; Edward Pettit, Esq., Sir Herbert Bruce Sandford, K. C. M. G.—Agents in Colombo—Messrs. J. M. Robertson & Co. Secretary—Mr. William Bois.

Authorised capital, £200,000 in 15,000 Ordinary shares of £10 each, and 5,000 preference shares of £10 each.

REPORT.—To be presented at the Tenth Ordinary General Meeting of the Lanka Plantation Company, Limited, to be held at the Offices of the Company on Wednesday, the 3rd Dec., 1890, at 3 o'clock in the afternoon.

1. The Directors snbmit their Report for the twelve months ending 30th June last, together with the Balance Sheet and Account of the Company made up to that date.

2. The Coffee Crop was 1,649 cwt., against an estimate of 1,438 cwt., and the amonnt realised therefrom was £8,145 2s 9d, a return of 18 cwt. less than last year, but upwards of £416 more in value. The following statement shows the quantity of and the amount realised in each year since 1881, omitting fractions of hnndred weights and ponnds.

COFFEE CROP FROM 1881 TO 1890 AND WITH PROCEEDS.

Years.	Ampittia-kande.	Arnhall.	Fruit Hill.	Fordyce & Garbawn.	Gonagala & Paramatta.	Rappahan-nock.	Rillamulle.	Thotula-galla.	Yattawatte.	Total.	Average Net Price.	Proceeds.
	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.		£
1881—1882...	687	687	304	598	563	1008	96	1044	...	4991	66/11	16,704
1882—1883...	520	1154	43	256	494	363	210	1350	83	4476	74/9	16,735
1883—1884...	985	975	100	487	314	783	251	1262	211	5373	61/10	16,618
1884—1885...	831	619	199	341	658	793	322	1683	49	5499	59/	16,241
1885—1886...	316	550	61	453	275	119	75	540	23	2416	66/8	8,060
1886—1887...	621	564	73	304	518	384	117	829	10	3426	86/1	14,891
1887—1888...	159	84	(all tea)	434	268	324	78	234	...	1601	73/10	5,910
1888—1889...	139	195	,,	59	354	429	68	409	11	1667	92/3	7,728
1889—1890...	161	215		217	395	63	41	556	...	1649	98/8	8,145

3. The Cinchona Bark shipped has been 62,298 lb. which has been realised, and has produced £83 907 1d. A slight improvement in this market has taken place, and at present there seems some prospect of a further advance. The Directors therefore propose to harvest more of this product if the prices become satisfactory.

4. The quantity of Cocoa estimated was 600 cwt., and the crop produced 684 cwt., realising £3,223 3s 3d. The cocoa trees are looking well, and there is every prospect of a larger return than has hitherto been obtained.

5. The cardamoms have produced 5,596 lb. nearly twice the estimated quantity (3,000 lb.) The amount realised was £298 7s.

6. The tea received from the Fordyce, Gonagalla, Fruit Hill and Ampittiakande estates has amonnted to 231,999 lb. (of which 38,650 lb. only was made from purchased leaf), in addition to which 1,050 lb. were sold in Ceylon. The proceeds amounted to £10,050 15s 4d, and it is hoped that a larger return will be obtained this year without purchasing outside leaf. The green leaf sold from the estates where the Company have no factories was 112,030 lb.

The following Statement shows the acreage and state of cultivation of the Company's Estates on the 30th June last—

Estate.	Coffee.	Cinchona.	Tea.	Cocoa.	Cardamoms	Rubber and Sapanwood.	Grass.	Pattina.	Forest.	Total.
Ampittiakande...	95	...	193	...	...	...	2	8	34	332
Arnhall ...	134	40	124	...	...	...	15	35	25	373
Fruit Hill ...	...	...	220	...	...	...	...	...	...	220
Fordyce and Garbawn ...	130	...	326	...	...	...	23	...	135	614
Gonagalla and Paramatta ...	165	...	141	...	...	...	...	15	1	322
Rappahannock..	105	56	185	...	...	...	20	62¾	45	473¾
Rillamulle ...	46	...	175	...	15	...	2	...	20	258
Thotulagalla ...	305	...	77*	...	...	...	...	143	53	558
Yattawatte ...	...	...	45	371	29	45	75	105	277	947
	980	96	1468	371	44	45	137	368¾	590	7409¾

* Partly in Coffee.

The Directors regret exceedingly the death of Mr. J. T. White, who was their esteemed colleagne for nine years, and whose experience in Ceylon was of considerable value. As the Shareholders are aware Mr. White retired at the last meeting and it was not considered necessary to fill up the vacancy then created.

Mr. Gerge Allen and Sir Herbert Brnce Sandford retire on this occasion, and being eligible offer themselves for re-election.

Mr. John Smith, the Auditor (a Shareholder), also retires and offers himself for re-election.

The Directors regard the system of management, which has been in operation dnring the year 1889-90 as very satisfactory, and they believe that the best possible results have been obtained, and they hope the improvement which has taken place in the position and prospects of the Company will be maintained. Every economy which can with safety be effected is brought under their notice and gradnally the cultivation of Tea is being extended. During the past year 200 acres have been planted, increasing the acreage of the Tea Gardens from 1,268 to 1,468 acres.

TRADING ACCOUNT FOR THE YEAR ENDING 30TH JUNE, 1890.

Dr.

To Cost of Cultivation in Ceylon, viz.—			£	s.	d.
Ampittiakande			2,640	10	7
Arnhall			942	15	2
Fordyce and Garbawn ...			4,418	12	2
Frnit Hill			1,347	8	5
Gonagalla and Paramatta ...			469	5	3
Rappahannock			1,370	11	8
Rillamnlle			556	19	1
Thotnlagalla			1,813	3	8
Yattawatte			1,689	14	11
General Expenses			214	10	10
			15,463	11	9
Less—Debit to Suspense Account.—Special Expenditure on Factories	1,334 6 9				
Tea Planting ...	733 14 3				
			2,068	1	0
			13,395	10	9

	£	s.	d.
To Insurance	113	1	4
To Balance carried down ...	8,992	5	4
	£22,500	17	5
To Interest on Loans, &c. ...	790	18	9
To London Expenses.— Directors' Fees, Secretary, Income Tax and General Office Expenses ...	909	2	1
To Balance carried to Profit and Loss Account	7,292	4	6
Cr.	£8,992	5	4

	£	s.	d.
By Net Proceeds of Coffee sold in London	7,791	11	9
Do. do. Bark do. ...	783	9	1
Do. do. Tea do. ...	10,029	8	4
Do. do. Cocoa do. ...	3,223	3	3
Do. do. Cardamoms do. ...	298	7	0
	22,125	19	5
By Net Proceeds of Coffee sold in Ceylon	353	11	0
Do. do. Tea do. do. ...	21	7	0
	£22,500	17	5
By Balance brought down—Gross Profits	8,992	5	4

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDING 30TH JUNE, 1890.

Dr.

	£	s.	d.
1889—July 1st.—To Balance brought from 1888-9 Account	1,458	0	5
1890—June 30th.—To Dividend paid on Preference Shares for half-year ending 31st Dec. 1888	415	7	0
Half-year ending 30th June, 1889...	415	7	0
	830	14	0
To Amount written off for depreciation of Machinery and Buildings, and in respect of Expenditure on Tea Planting, &c.	1,220	4	3
To Balance carried down ...	3,783	5	10
Cr.	£7,292	4	6

	£	s.	d.
June 30th.—By Balance brought down	3,783	5	10
Less—Interim Dividend for half-year to 31st December, 1889, on Preference Shares already paid	415	7	0
	3,367	18	10
Memo—To pay.—Dividend on Preference Shares for half-year to 30th June, 1890	415	7	0
A Dividend of 3/ per Share on the 15,000 Ordinary Shares	2,250	0	0
	2,665	7	0
Balance to carry forward ...	£702	11	10

I have audited the above Balance Sheet and Profit and Loss Account, and in my opinion, they are properly drawn up, so as to exhibit a true and correct view of the state of the Company's affairs shown by the books of the Company. JOHN SMITH.

November, 1890.

Dr. BALANCE SHEET.

	£	s	d
To Capital.—			
15,000 Ordinary Shares of £10 each	150,000	0	0
1,420 Preference „ £10 each	14,200	0	0
	£164,200	0	0
Unissued 580 Preference Shares equal to £5,800			
To Loans ...	12,000	0	0
To Sundry Creditors—			
Bills Payable ...	7,650	0	0
Sundries ...	934	12	7
	£8,584	12	7
To Balance of Profit and Loss Account	3,367	18	10
Total ...	£188,152	11	5

30th June 1890. Cr.

	£	s.	d.
By Estates—			
Ampittiakande	26,225	5	0
Arnhall	18,521	6	9
Fordyce and Garbawn ...	16,149	2	0
Fruit Hill	10,195	5	7
Gonagalla and Paramatta ...	18,185	12	11
Rappahannock	22,846	10	7
Rillamulle	10,333	11	9
Thotulagalla	35,143	13	1
Yattawatte	6,083	13	9
	163,684	1	2
By Cash—			
At Bankers, Deposit Account ...	3,500	0	0
„ Current Account ...	61	11	1
In hand	1	19	4
	3,563	10	5
„ Payment on Account of Up-keep, 1890-91	561	19	3
„ Produce Unsold on 30th June, since Realized—			
Coffee	2,224	18	6
Bark	784	11	1
Cocoa	309	5	6
Tea	2,432	9	6
Cardamoms	33	8	8
	5,784	13	3
„ Sundry Debtors	589	6	8
„ Machinery, &c.	2,050	4	4
„ Suspense Account—			
Balance 30th June 1889 ...	11,070	19	7
Expended on Factories, Machinery, and on Tea Plantings during 1889-90	2,068	1	0
	13,139	0	7
Less—Amount charged to Profit and Loss Account for Depreciation	1,220	4	3
	11,918	16	4
	£188,152	11	5

The opinions expressed by the Directors at the last Meeting have proved to be correct; for the year 1889-90 has resulted in a profit of £7,292 4s 6d—not a large amount certainly, but sufficient to have enabled the Company to pay a dividend of 3½ per cent. on the Ordinary Shares had not the dividends on the Preference Shares to the amount of £830 14s been in arrear and a debit balance of £1,458 0s 5d to be discharged, both these sums having been satisfied, the Directors are able to recommend the payment of the dividend of 6 per cent. on the Preference Shares, and also of a dividend of 3s per share on the Ordinary Shares.

The Directors believe the estimates of crops and of expenditure for 1890-91 have been made with the greatest possible care, but the uncertainty as to the rates of exchange which will prevail precludes the formation of any reliable opinion as to amount of profit which will be gained.

A summary with the details and the report of the Agents may be seen at the office. By Order,

WILLIAM BOIS, Secy.

No. 8, Old Jewry,
15th Nov. 1890.

THE LANKA PLANTATIONS COMPANY.

(*Communicated.*)

The Lanka Company, in common perhaps with the several ventures in Uva, has been representative to a great extent of the many instances in which concerns which flourished exceedingly in the old days of successful coffee planting found themselves face to face, when that form of cultivation failed, with the necessity for its gradual abandonment and the planting of the several estates it possessed with the tea plant. To effect this the lapse of years has been necessary, and such profits as could be made during this period, had to be devoted to the operation we have referred to. That this has at length fully accomplished,

and that the cost of doing so has now been entirely met and the resultant indebtedness wholly wiped out, is significant of what it has been possible for wise administration and judicious moderation with respect to current profits to effect. And the result to the exercise of such administration and of such judicious moderation is now to be seen in the strong position to which as you well remark, the Lanka Company has at length attained. It commenced the operations of the current year wholly free from the debt which has for so long weighed upon it, and its directors will be at liberty to divide the anticipated profits among its long-suffering and patient shareholders.

That this end has been achieved is convincing as to the remunerative character of the local tea-planting industry. No more striking proof, indeed, of this could be found than the rehabilitation of the Lanka Company affords. It surpasses in the efficiency of such proof even the large dividends that Tea Companies of more recent establishment have been able to declare. I feel every confidence that erelong the announcement which the Lanka directors are able to make will be followed by that of similar results by those of the several Uva Companies who have had to struggle against adverse conditions of a similar type. When this consummation has been fully attained we may expect no longer to see the list of dividends declared by Ceylon Tea Companies qualified by the inclusion in it of what have been to all appearance—so far as the uninformed British public could judge—of perfectly negative results in the case of some such Companies. I can feel no doubt that this improved state of things must have a very marked effect upon the general credit assigned to our local tea enterprise, so that it must conduce to a further extension of tea cultivation in Ceylon. It is to be hoped that Russia, America and Australia may speedily become large customers for Ceylon tea direct, so as to take off a goodly part of our yearly increasing exports.

When noticing the Reports issued of recent years by the Lanka Company you have expressed your appreciation of the very full information they contained as to the prospects of its several properties. The giving of this information was, as regards the generality of similar reports, a wholly new step, but one which has been fully justified by the proof now afforded of the accuracy of what was predicted. At times during the troublous period through which the Directors have now successfully passed, their course of action has been strongly criticized. No doubt it was a hard trial to the shareholders to have to wait year after year without return for their investment, but the logic of accomplished facts will now have fully justified the wisdom of the course to which at times so much exception was taken.

COFFEE *V.* TEA.

(*By an Old Hand.*)

Tea planters would do well to study the relative positions of these staples as regards deliveries (consumption) in the non-producing countries of Europe and America. Some idea may be formed of the vastness of the coffee enterprise by reducing to lb. the enormous deliveries said to have taken place in Europe and America in one month. March last, viz 62,000 tons = 138,000,000 lb.!—*Vide* Rucker & Bencraft's Coffee Circular published in *Ceylon Observer*, 1st Dec. 1890. The above weight is about equal to the annual deliveries of Indian and Ceylon tea combined, in the countries mentioned. Ceylon's coffee contribution for 1890 will be only about 4,000 tons for distribution in all countries.

Gow, Wilson & Stanton, in their circular dated 14th Nov. 1890, state that as regards home consumption of teas as taken from all the bonded warehouses in the United Kingdom for 5 months—1st June to 31st Oct.—China actually increased by half-a-million lb. as compared with the previous year. For the same year and for the same period Ceylon tea increased by 3 millions only, say at the rate of 7 1-5th millions only for 12 months! New markets are, therefore, urgently wanted.

Tea and coffee differ but little in the value per lb. just now, *e. g*:—

1 cwt. = 112 lb. @ 1d. = 9s 4d.
@ 11d. = 102s 8d.

102s 8d. = 1 cwt. tea at present average price of 11d per lb.

104s 6d = present price per cwt. of Ceylon middling plantation coffee.

DRIFT TIMBER.

To judge from all recorded facts, Ceylon would appear to be in the direct line of some ocean current or currents setting direct from Burma or the Malay Peninsula. At all events, if such currents do not flow in a direct line thence, the effect of a combination of them is to carry drift timber from these Eastern and North-eastern shores to those of Ceylon. And it further appears to be certain that these currents impinge finally upon the north-eastern coast of this island.

Unless it be upon some such conclusion, it would be impossible to account for the number of teak logs which are occasionally drifted ashore along the line of coast in which Mullaittivu may be said to be the centre. We believe that it is chiefly along this line of seaborde that the *flotsam* and *jetsam* of such logs occur, and as they arrive sometimes in considerable numbers, it may fairly be concluded that they have all had nearly the same starting point. All the timber which is so cast upon our north-eastern shores possesses evidence of having been felled and prepared for transport. It does not consist of merely the trunks of trees which have been uprooted by some natural force, the logs in every instance almost, having the holes at their ends which have been cut for the purpose of permitting traction. We know that trees so cut in the timber forests of Burma and the Malay Peninsula are allowed to float down the rivers from the sites where they are obtained to the coast line, and it is conjectured that it is such pieces as escape arrest at the river mouth which float seawards on their western journey and eventually come to land, as we have said, along our eastern, and specially on our north-eastern coasts. Everyone knows the value of Rangoon teak. It is preferred here, as elsewhere, for very many purposes, and consequently possesses a high value. Our *Government Gazette* often contains advertisements of sales being made of such timber; but as a matter of fact, we learn that all drift timber washed ashore from the sea is treated as "wreckage" under the first clause of Ordinance No. 5 of 1861, and the net proceeds realized by its sale are credited not to our general revenue, but to the Imperial Government. The amount is trifling however. We cannot give the exact sum so credited for timber alone; but the following are the sums credited to the Imperial treasury on account of unclaimed wreckage of all kinds since 1885:—

	R	c.		R.	c.
1885	759	80	1888	162	06
1886	277	96	1889	225	51
1887	375	73			

We have been told that during the late Mr. Dyke's administration of the Northern Province it

was the exception rather than the rule for the drift timber which reached the very extended shores of that province as it was constituted under that able officer's *régime*, to be offered for public sale. The autocracy of Mr. Dyke's ideas, dictated his resolution to deal with these windfalls from the ocean after a fashion of his own. It was his belief that he could effect a greater service by using up the material upon useful public works than by offering it to the biddings—at that date of a necessarily restricted character—of the few Jaffnese who felt inclined to offer for the timber! The logs were, we are told, all brought to the impounding ground at Jaffna and used by the then Government Agent for such purposes as seemed to him to be good! The fact may, and doubtless does account for the very free use of Moulmein teak in the public buildings in and around Jaffna. As an instance of such free use, it may be noted that the principal portions of the pretty little mission church at Chundikkuli are entirely of this valuable timber, and we have heard that the Missionaries of those days had little or no difficulty in procuring free grants of it for the construction or restoration of other mission churches or buildings. But under the changed circumstances of the last twenty years, it is not desirable that this free hand in dealing with public property should be continued, if indeed it has been continued. We have no doubt, however, that with Mr. Dyke's rule the system we have mentioned came to an end, and that the Imperial Treasury is now credited, as noted above, with the full amount realized by the sale of these waifs of the sea; but how if my "Lords of the Treasury" in England heard of Mr. Dyke's mistaken disposal of their "wreckage" property up to thirty years ago?

MR. WESTLAND'S BRICK TEA.

We have submitted the cake of brick tea to Lieut. de Frisch, the Russian Consul, who has kindly given his opinion as follows:—"It is not nearly so hard—so well pressed—as the brick-tea used in Russia; it is much smaller (a fault easily remedied); the Russian bricks are usually ½ lb. each in weight, marked (like chocolate) by indentations so as to break off easily into six pieces; the bricks are usually of a greyish colour, Mr. Westland's is black. The tea of the latter is, however, very good." We have no doubt that Mr. Westland would very quickly come up to the proper standard with his brick tea, if there were due encouragement, or if he could protect his mode of working for a few years, at a reasonable rate. But until our tea trade with Russia more fully developes and until our exorbitant patent fees are reduced, there is not much encouragement. However, as regards brick tea making, we hear there are locally other "Richmonds in the field."

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Nov. 20th.

CINCHONA.—At Tuesday's auctions a fair average quantity of bark was offered, the catalogues embracing.

	Packages		Packages	
Ceylon bark	1,510	of which	1,204	were sold
East Indian bark	966	do	789	do
Java bark	61	do	61	do
S. American bark	233	do	...	do
Total	2,770	do	2,054	do

The assortment was a poor one, and consisted very largely of Succirubra barks from Ceylon and Southern India, common to medium chips and spokeshavings being particularly prominent. The highest price paid for manufacturer's barks was 10d per lb., and that only or one or two lots. A dull tone prevailed throughout the auctions, and prices were generally easier, especially for fine druggists' barks. The average unit may now be placed at 1½d per oz.

The following were the quantities purchased by the principal buyers:—

	LB.
Agents for the Mannheim and Amsterdam works	122,257
Agents for the Frankfort o/M and Stuttgart works	88,829
Agents for the Brunswick works ...	87,232
Messrs. Howards & Sons ...	59,575
Agents for the American and Italian works	36,854
Agents for the Auerbach factory ...	30,102
Mr. Thomas Whiffen ...	05,256
Sundry druggists and speculators ...	60,405
Total quantity sold ...	510,510
Bought in or withdrawn ...	137,312
Total quantity offered ...	647,822

QUININE very quiet: the only business we hear of this week is 10,000 oz. second-hand German bulk at 1s per oz. The nearest quotations now are 12d Per oz. sellers, 11¾d buyers, no business.

SOILS AND THEIR TREATMENT.

We have marked for extract into the *Tropical Agriculturist* an interesting review from the *North British Agriculturist* of what is evidently a very valuable handbook on soils, by Dr. Fream, the historian of the Rothampsted experiments. A point in favour of the Ceylon planters seems to lie in the fact that the roots of tea and other perennial plants, such as are cultivated so largely in Ceylon, are ever in the soil, so reducing the loss of nitrates, to a minimum, probably. It is in fallow land in Europe that the loss of nitrates from drainage is greatest. On the other hand the capillarity of our mountain soils, at any rate, is not increased by the beneficial action of earth worms. We have seen the "castings" of a large species on patanas, but the earth-worms so common and so beneficially active in Europe, seem to be absent from, or very rare on, estates. We do not suppose that the existence and action on some lowcountry estates of white-ants is considered in the light of compensation. In the absence of the soil-digesting and tube-forming worms, *tilth* by means of agricultural implements would seem to be the more imperative. But here are several of our most experienced tea planters asserting that they have seen no good results, from forking of the soil on their estates! All our preconceived ideas having been in favour of the mere stirring of the soil, even without the burying of prunings or the application of manure, we are, we confess, unwilling to abandon them, even on such testimony as that of "C. S. A.," "T. C. O." and other men of equal experience, The stiffness of our soils, which enables them to so great an extent to resist wash, surely renders tillage the more necessary? As regards coffee cultivation and the good effects of merely opening up the soil, there is the famous case on record. A planter dug the usual holes for manure, which he expected the Colombo Agency house to despatch. For some reason the supply of manure never arrived and the holes were left open, except for the loose soil washed back into them. *The following crop was one of the best ever gathered on the estate.* We should like to see the question of forking tea soil further discussed by such planters as "G. A. D.," "T. M.," "A. L. C." and others, and reasons given for what is undoubtedly a heresy in general agriculture, before we give in our adhesion to the new faith. What will Dr. Voelcker say to the dis-

covery that tillage apart from manure confers no benefit on tea? He will probably ask for the essential difference between tea and all other cultivated plants.

THE UTILISATION OF BONES IN AGRICULTURE.

About the latter end of 1889 it pleased the Government of India to display an interest in the export of animal bones from India. The Government of India was under the impression that exports of bones were on the increase. From statistics of trade, however, we learn that as regards this Presidency, at any rate, there was a fall instead of a rise in exports, as the average shipments per annum during 1884-86 were 3,528 tons, while the annual average during 1886-90 was 2,772 tons. This fall is attributed to a dimunition of the Ceylon demand, which is now met more from Australia. At one time, the island obtained almost all its supplies from this Presidency, but it now draws largely from Australia. Looking at matters as the Government of India does, the decrease is matter for pleasure rather than regret on the part of Madras. The gentlemen who study matters from Simla know that bones may be largely used for conversion into manure, and the careful guardians of India's agricultural interests manifest anxiety concerning the "threatened drain of the manurial resources of the country." As regards Madras the dread appears to have been groundless, but it has not been without good results. A report was called for some months ago on the sources whence bones for export are obtained, the extent to which they are collected in the Mofussil, their treatment before shipment, etc.; suggestions were invited for the utilisation of bones as manure in this country; and a summary was asked for of any experiments made. This has brought to the front a considerable amount of information that will interest many, and may be found useful.

Collectors report that bones are not generally used in this Presidency as manure for agricultural purposes, except on Coffee plantations on the Nilgiris, the Shevaroy Hills, and in parts of Malabar and Tinnevelly. Bone manure, it is said, is occasionally applied to coconut trees in the Tanjore district. In South Canara bones in an unbroken state are sometimes burned at the foot of indifferent jack and coconut trees. But most of the bones collected are exported, the greater part going to Ceylon and a few to the United Kingdom. The Tinnevelly and Malabar districts head the list with about 1,200 tons and 2,000 tons, respectively, of exports annually. Ganjam, Kistna, the Ceded districts and Kurnool exhibit very small exports, the highest being about 400 tons from Cuddapah. Godavari exports from 340 to 430 tons annually; Vizagapatam from 100 to 250 tons; and Nellore about 100 tons. Most of the Southern Districts export about 150 to 200 tons. In Madras a single dealer has been exporting about 200 tons annually to Ceylon, during the last ten or fifteen years. In regard to the above supplies it is stated that the bones are collected by chucklers, pariahs and other low castes, who dispose of the carcases of cattle. Sheep and goat bones are rejected in some parts, because they are light, and do not sufficiently reimburse the collector for the cost of getting them together. When the collector has got his supplies ready he conveys them to the Sea Coast, and there sells them to dealers at whatever rates he can get. Apparently the price has recently ranged about 2 annas per Madras maund, equivalent to, say, R11 per ton. On this the dealers have to make a profit before selling to shippers. Owing more, perhaps, to the greater demand than to the increased difficulty of delivering supplies, on the Nilgiris prices are much higher, raw bones being delivered by contractors at a cost of R30 to 33 per ton; while bone dust runs from R40 per ton as high as R70, according to situation.

As a rule the bones are simply dried and broken by hand before exportation. In Malabar, however, and to a small extent in South Canara, they are crushed by machinery and converted into meal for use as manure. They are generally steamed first. Experiments made in this country and elsewhere have established long ago that bones are rendered more active as manure by being mixed with lime, saltpetre, cattle-manure, oil-cake or sulphuric acid, as well as by disintegration, steaming and reduction to ash. And it is mentioned as a proof of the value of bone manure that a Native gentleman tested half an acre of wet land (unmanured) with 375 lb. of bone ash when transplanting paddy seedlings, the cultivation and irrigation being as usual. An adjoining plot of an acre, also previously unmanured, was cultivated without the addition of any manure. The former yielded 720 measures of paddy and 1,260 lb. of straw, *i e.*, 1,440 measures of paddy and 2,520 lb. of straw per acre; while the yield from the unmanured acre was 828 measures of paddy and 2,352 lb. of straw per acre. The increase due to bones ash was thus 612 measures of grain and 168 lb. of straw in one acre. After an experiment made by Mr Lawson of mixing sulphuric acid with coarsely powdered bones and applying them to cinchona plants, it was found that the alkaloids exhibited marked improvement, and other experiments have fully established the advantage of using bone manure. As, in addition, considerable quantities of bones are consumed as bone-charcoal in the Su ir factories of Aska, Nellikuppam and Tutioorin,set would appear that bones might be much more utilird than they are at present, if collection and prepaation were systematically conducted.—*Madras Times.*

ROUNDABOUT PAPERS.

COCONUT ESTATES: EUROPEAN *versus* NATIVE.

There are a great many coconut estates owned by Europeans in Ceylon, and particularly in the Eastern Province, and their methods and modes of cultivation are so different from those adopted by the native owners, proprietors, or village-holders, that it may not be uninteresting to your readers to have laid before them a short account in explanation of the particular ways in which each side work, and the results consequent upon them.

The Englishman begins by thoroughly felling, clearing, and burning his land, leaving as many stumps and large branches on the ground as possible, which will, when thoroughly decayed, go far to enrich the soil in the future. He then lines and holes his land afterwards, planting the young trees in the holes about 23 feet apart, (or about 90 plants to the acre), which experience has shewn to be the proper distance, so that the branches of the tall palms do not lock, or overshade each other, thus allowing (in the future) the sun at mid-day, morning, and evening to warm the soil, for it is found that, if trees are planted closer, it interferes in a great measure with their bearing capacity. The young plants are selected with an eye to their strength and general appearance, a plant with a weedy stem and thin foliage being rejected, one with a thick stem, strong well-set and curly dark green branches being all that is required

Next comes the watering, which must be carefully done, (except of course in the rainy season or when timely showers moisten the ground) for three full years, or even four, after planting.

The proper watering of the young plants is of the utmost importance; each young plant should get a full chatty each time, or from 3 to 4 gallons, and the neglecting of this may in the future have very disastrous consequences. To entrust this portion of the estate work to coolies would be madness, as in order to evade their proper amount of watering, they will divide the contents of one chatty between two or even three plants, and the water will not be nearly sufficient to saturate the roots of the young plants. It is, therefore, necessary to employ an estate watcher, or a Cangany, to supervise the watering gang, when there is some chance of the work being well done.

The trees having once tided over all the hindrances incidental to coconut planting, such as beetles' black and red, porcupines, and wild pigs, and having grown to 4 or 5 years old, they are left to nature, and even then they are liable to beetles and lightning, which prostrates many a fine young and old tree.

Englishmen manure their trees by turning into the ground between the rows all that the tree drops, and tying 4 or 5 cattle at the foot of each tree, where a sufficient trench has been previously made. These cattle are tied there every night, for 3 or 4 nights running, and then removed to a fresh tree, the manured tree having its trench carefully covered up, for the soil to take in.

The nuts are picked once every three months in the season, being taken to the 'barbacues' or drying ground, split into halves with one stroke of a large hatchet, and turned kernel upwards and left to dry in the sun; while at nights the kernels are turned downwards to keep the dew from them. After 3 or 4 days' drying, the kernel begins to shrivel in the shell, and men, women, and children are employed to scoop them out into heaps. This is called the 'copra,' and is ready for sale, and will fetch from £3-10 to £4 per candy of *five* hundredweights.

The native estate owner, or village coconut garden proprietor, opens and plants his land in about much the same manner; but he puts in his plants very much closer, so that one acre of land holds from 100 to 120 young plants not very correctly lined or even properly holed. In many instances he will even plant *two* trees in one hole, but the result will be that they will never bear properly. When once the plants require no watering, he will on large properties leave them to shift for themselves, letting thorny scrub and jungle grow around them, and otherwise neglecting the property; so that it very soon deteriorates in value and bearing capacity. He will never put back into the ground or bury what falls from the tree, or otherwise manure his property, so that nothing ever goes under the soil. But in village gardens, which are kept splendidly clean, and where they are constantly burying dirt and rubbish, the trees come on splendidly and bear beautifully, giving large crops. I stood near a village tree when they were picking nuts, in the spring of last year (1888), and counted 203 *ripe* nuts picked from one single tree.* CATAMARAN.

—*Times of Ceylon.*

* This is rather a tall order.

RAIN.

The following paragraphs are found in an article in *The Missionary Review of the World* for July, 1890, and are from the pen of the well known missionary philanthropist, Dr. John L Nevins, of Chefoo. The subject of the article is "Famine and the Work of Famine Relief": —" Famine is the result of two opposite causes—drought and flood—which may be referred to one and the same cause, the unequal distribution of the rainfall, producing drought in some places, and floods in others. In that part of Eastern Asia which includes the great empires of Hindustan, China, and Japan, the alternation of the winds of summer and winter are so marked as to produce what are called the northern and southern monsoons, to which the climatic peculiarities of this whole region are to be largely attributed. During the winter months the northern monsoon blows almost continuously, and sometimes with great violence, from the Arctic regions to the tropics. Early in the spring the tropical winds, charged with moisture, commence moving northward, at first continuing only for a few degrees of latitude, but gradually asserting their supremacy, and extending farther and farther northward, until, in July and August, they constitute the southern monsoon, which, on the entire coast of Asia, extends from the tropics to forty degrees of north latitude. The region in which the southern monsoon and the colder breezes of the north meet, like two opposing armies alternately advancing and retiring (the colder atmosphere condensing the vapour with which the southern monsoon is surcharged forms the rain-belt, which, as it advances step by step to the north, brings what is called the rainy season). The rainy season reaches Ningpo and Shanghai, in Central China, the latter part of May, when the rain is almost constant, while north, in the province of Shantung, the sky is cloudless. This monsoon, after discharging its moisture in the south, often continues its course northward for several degrees of latitude with great violence, and almost as dry as the sirocco of the desert. In the latter part of July, and nearly the whole of August, when the air in Central China has risen to high temperature, the southerly monsoon blows past that region, holding its moisture in suspense until it is condensed, and falls in Northern China and Manchuria. These two monsoons, with the fluctuations in their force and temperature, produce the very irregular rainfall of the rainy season. In one section of country there is sometimes such an excess of rain as to form destructive floods, while in an adjacent region, north or south, there is a comparative deficiency. Sometimes the rain falls gently for days, and at other times in such volumes that it is impossible to distinguish objects at mid-day a few hundred yards distant, and water-courses half a mile in width, in which the stream had shrunk to a little rivulet, requiring only a few stepping stones for the foot traveller to pass, in an hour's time becomes a rushing torrent, overflowing its banks, and rendering all passage, for the time being, impossible."—*Chinese Times.*

COFFEE PLANTING IN GUATEMALA.—Coffee trees, transplanted from the nursery after a year's growth from the seed, are usually planted 9 feet apart, making 484 trees to the acre; but where the soil is exceedingly rich, at an altitude of 3,000 feet above the sea, they are placed 12 feet apart to prevent interference with each other's luxuriant folliage. Each tree produces 1 to 2 pounds of the berry in *oro* (that is, after being cleaned and polished and ready for the market), according to the soil and temperature, so that the product of an acre of coffee trees would be from 484 to 968 pounds in *oro*. At the present price of 23 cents per pound the result would be $111.32 or $222.64 per acre, which, at the average cost of 5 cents per pound for production and transportation to the seaboard, would show a net profit per acre of $87·12 or $174·24, according to richness and adaptability of soil and condition of temperature. —*American Grocer*

THE MANUFACTURE OF RUBIES.—What is the use of exploring unknown and dangerous countries for rubies when the secret of their artificial production has been discovered? This was the question which the Academy of Sciences discussed on the report of MM. Frémy and Verneuil, who for some time past have been making chemical experiments in the manufacture of these stones. More valuable than mere theory was the fact that the two chemists exhibited some hundreds of specimens of the glittering red crystals they had succeeded in producing. The rubies were admitted by all to be much superior to anything hitherto manufactured. No little danger, however, attends the process. The chemicals have to be fused at a heat so intense that M. Verneuil during the course of the experiments nearly lost his sight. While manufacturing rubies the two chemists found that at a certain stage of the operations crystals of the colour of sapphires were produced, but the hue hitherto obtained has not been equal to the hint of the real gem.—*P. M. Budget.*

Correspondence.

To the Editor.

FORKING OR DIGGING TEA—NO. I.

Dec. 1st.

DEAR SIR,—In answer to "Pervert" I have to state that I have seen it tried in many districts, and I cannot say that I have ever noticed any beneficial result in forking alone. In fact as your correspondent mentions I also have noticed a marked falling-off in Tea after forking; this I believe is owing to its being *overdone*, for the breaking of nearly all the feeding roots within 10 inches or a foot of the soil must seriously check the vigour of a tree for a time. Of course from digging in manure the results are well-known to be most satisfactory, and I have also seen digging in prunings in every alternate line tell most favourably on the tea bushes, but *general* digging I have not found good, but I believe if carefully done in every *alternate* row on certain stiff soils at the proper time, it cannot but have a beneficial effect on the tea. V. A.

No. II.

Nov. 30th.

DEAR SIR,—I have found no good results whatever follow forking, unless the operation is accompanied by the application of manure. I have tried it in tea of different ages, and in different soils, with equally unsatisfactory results. T. C. O.

No. III.

DEAR SIR,—Your correspondent "Pervert" is quite right in saying, that there is a great diversity of opinion on the merits of forking tea, the effects of the operation being anything but calculated to inspire *general* confidence.

In Dolosbage with a wet subsoil and heavy rainfall,—the two things, one would say, that were *not* conducive to the success of such a system of cultivation,—several planters swear by it, and in the course of my wanderings I often hear of good results following the forking up of the soil in other districts; but *personally* I am rather disposed to agree with your correspondent, and I have no desire to renew the experiments I have made.

Digging in the prunings and rubbish on the ground, I think does good, especially if *showery* weather is expected. ALPHA.

No. IV.

DEAR SIR,—Digging, in my experience, shows no results whatever on the tea, unless manure is thus applied, when paying results always follow. I would only fork up every other line. C. S. A.

No. V.

Lower Ambagamuwa, Dec. 7th.

DEAR SIR,—I have in my career as a planter had a big share in the digging and forking up of the soil, both in coffee and tea land. My nine years' experience of this work with the latter product is certainly contrary to that of "Pervert." Digging is scarcely at all needed where the soil is of a friable nature unless for the sake of economy: if you were renovating such soil by applying manure, digging it in you will find pay better than the old-fashioned holing system. I say digging is a *sine qua non.* It is perfectly true, and I admit that forking up will and does, as a rule, throw back the flushing tendency of the tea; but this is only what one must naturally expect. Take any other shrub, dig about it in a similar way, whatever its yield is to be you will invariably, nay always, find it on the diminishing after such a process, and for such a time only as your shrub has had to battle with the effects of disturbed nature. But what about the after results? Comment is unnecessary. In 1884, a field of 12 acres tea a year old was to all appearance stunted and far from having a healthy appearance, I resorted to digging as a last resource before finally abandoning the field. In six months after digging, it beat my most sanguine expectations, and today that same field is yielding a considerable crop. This was purely a root-bound field, the soil requiring to be broken up; once the roots had free play the bushes naturally grow and filled out. Digging ought to be periodically carried out where our soil is so apt to get caked up. Apart from this, it is one of nature's requirements. I believe digging up the soil has been in vogue since the creation; does not the good old Book teach us "Break up the fallow ground, dig about the roots"?—Yours truly, C. J.

CEYLON TEA CROPS AND FUEL SUPPLY.

DEAR SIR,—Looking over the Directory I find you estimate quantity of tea to be exported in 1891 at 54,000,000 lb.

I believe the quantity of wood fuel required to make 100 lb. of tea averages about 60 lb., so that fuel is becoming a very important item.

The Forest Department has done a great deal, but undoubtedly thinks too much about showing a profit on its working; but after all "Heaven helps who help themselves," and so proprietors should secure waste land in the neighbourhood of their estates and factories and plant quick-growing suitable trees.

When demand for fuel reaches 14,286 tons a year, it will be a serious matter for those who have forgotten to look ahead.—Yours, TEA POT.

THE WATCH COMPASS.

DEAR SIR,—I am surprised that "Astro" thinks that the watch could never be made to revolve around its hour hand in northern countries. Let him take a circular piece of pasteboard, lay a wire across it, fastening it on by gummed slips, and then pointing the wire to any quarter of the heavens see if he cannot twirl the disk. The hour hand of a watch corresponds to the wire, and the possibility of revolving the watch around it as if it were an axis, does not depend on the latitude of a place. This makes it plain that the watch does *not* "adjust *itself* to the plane of the sun's daily path." It can however be adjusted by taking care to keep that point of the dial which is to indicate south higher than any other point, while the hour hand is pointing to the sun. This might easily be neglected if attention were not called to it, as I believe has not been done thus far, and it would vitiate the whole experiment, and might give a serious error. This omission made the original rule practically valueless. The required adjustment introduces a complexity which lessens the advantage of the watch compass, and "Astro" admits that for five months in these parts the rule has to be altered and for other four months is only approximate. The fact is that anyone with a little ingenuity can tell the points of the compass quite accurately by simply noting the position of the sun, if he only knows the time of day—Yours truly, ANOTHER YANKEE.

THE NUWARA ELIYA CARP AS FOOD-SUPPLY:

SUPPLY OF FRY FREELY AVAILABLE FOR CULTURE IN PONDS, TANKS, &C.

Nuwara Eliya, Dec. 6th.

DEAR SIR,—Will you allow me through the medium of your paper to draw attention again to the excellent food supply that the Nuwara Eliya carp (the Prussian carp) yields.

In Nuwara Eliya they do not grow to any size, probably in consequence of the cold, but at lower elevations they thrive well and multiply amazingly.

Some that I sent in the fry-stage to a gentleman in Deltota last year are now 1½ lb. in weight, and are excellent eating; and the experience of another gentleman in Dimbula, who also had some, is to the same effect.

Any pond will do for them, and if a stream of water runs through it, so much the better.

To insure a supply of fish for the table they should be constantly fed with boiled rice or brewer's grains, when they will rapidly increase in size and become so tame that they may almost be lifted out of the water with the hand.

Any number of fry can be had here. They are easily transported; the only thing necessary being a large chatty slung on a pole with two coolies to carry it.—Yours faithfully,

C. J. R. LE MESURIER.

COFFEE CULTURE:—GREEN BUG AND ITS TREATMENT ON THE AGRAPATANAS.

DEAR SIR,—I should be very glad to respond to the request you make in *Observer* of 1st inst., could I give any more information on the subject, but really I have not much to add to what I have already given, for the simple reason that the comparatively little "bug" that we have had on these estates for the last two years or so has disappeared so quickly and done so little damage, that I have not found it necessary to do anything to it. I think this has been the general experience with good coffee about here, though I know from correspondence that I have had this has not been the case in some other quarters, and to such I strongly recommend the kerosene emulsion treatment supported by good manuring, if they wish to keep up the coffee and get crops. I believe that one of the principal reasons why we have had such comparatively mild attacks of bug is to be attributed to the earlier appearance of leaf-disease for the last few years compared with previous ones, for, I have carefully noticed that the bug begins to show signs of unhealthy life and dying off as soon as this disease really sets in. For the last few years leaf-disease has reappeared much earlier in the year than previously, and the bug has had a much shorter life than when it attacked us several months later. Of course the coffee has only been kept in really good heart by good cultivation. We have kept only the best fields, the rest having been planted up with tea year by year. It goes without saying that where there is not good cultivation the trees are altogether unfitted to stand the combined attacks of even a mild dose of bug and leaf-disease year after year and *yet bear profitable crops*. When I first commenced to apply the kerosene emulsion and lime, the "bug" was in full force and rampant; and I have already explained, that no other treatment (and I tried many experiments) succeeded in both saving the crop and leaving the coffee in good bearing condition. In fact, I lost some very fine coffee bearing heavily side by side with what I treated with kerosene emulsion, and which is still to the front, having given several good crops since then; and though this year's crop is a small one, yet the trees are healthy and promising, and this in spite of a bad attack of grub last year. There are other estates not far from this who can show similar results from following similar treatment, followed with good manuring. Still I think it is more than ever becoming a question as to which pays the better, with such tea as we have in this district, and the good yields per acre we are getting will show what even good coffee has to compete with. You ask for details of cost of application, but I think I have already given you this in a previous letter. The first year (the worst) was some R10 an acre including all cost of labour and materials on some 300 acres treated as I fully explained,—and the next year was about R5 with only part application of lime on some 150 acres; we have spent very little indeed since then.

The labour question would be to some an important one, for where there is much tea it generally takes all the labour to pluck at the time of the year that we get this bug worst, say April-May. Yes the coolies took some time to get into the most economical way of carrying on the work and required a good deal of looking after, but they gradually found it easy enough, or at least this was the case with the picked gangs whom I put on to "follow up" the first general application. We first went straight through all affected coffee, with all hands—merely sprinkling with lime the trees not attacked with bug, then I put on several small gangs of men to follow behind to wash off (simply 'unhinge" is all that is actually required) any bug that was left and to watch for the re-appearance of new life until the leaf-disease came on, when I found nothing further was needed.

I would just mention that as lime is supposed to be bad for tea I tried a thick mixture of liquid cowdung on the principle advocated in the interesting letter "From the Hills" *i. e.* to smother the bug. All I can say is that it seems to have been effectual, but I have not done it on a large enough scale to test the cost. It should be done in dry weather; Of course on some estates this would not be available, and it is a question whether it would not be most valuable as manure.*

W. B. J.

"COFFEE is being cultivated successfully in Bavaria," we read in the latest *Graphic*. But it must be a new species of coffee plant—an annual—to judge by the description which follows:—"It ripens well and has an excellent flavour, though tasting more bitter than the original tropical product. The plant is sown in the spring on sandy soil, and produces a delicate blue blossom about July, while the berry becomes ripe in August, being then a pale yellow." We should like to see this coffee, "sown in the spring" and blossoming a delicate blue in July!

FAILURE OF TOBACCO EXPERIMENTS.—In an order which it issued, the Madras Government "regrets to learn that the results of the experiments conducted by Mr. Caine in the growing and curing of tobacco during the last two years have proved to be so unsatisfactory. The reports of the several firms, to whom samples were sent by the Board for opinion, show that the leaves, when cured, were decidedly defective in the qualities required by the European market, and the very poor prices obtained in the local market for the indigenous tobacco, grown under the personal supervision of Mr. Caine, are evidence of the inferiority of the leaf to that raised by the natives themselves." The Government is not prepared to re-engage the services of Mr. Caine.—*Pioneer*. [The question now is, can success be expected in Ceylon, such as has not been attained in India?—ED. *T. A.*]

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* Of course, if there were no bug, but the double advantage of the application is that after smothering the bug and falling to the ground it is still valuable as manure. But how can even the best coffee survive the external attacks of green bug, which gives way only to *Hemileia vastatrix*, while the subterranean enemy grub gives way to neither?—ED. *T. A.*

LEAF WITHERING.

(BY THE "PERIPATETIC PLANTER.")

I have been asked recently what is the best temperature at which to wither leaf. This is a bigger question than appears at first glance, and a reply should not be given didactically, without being supported by a statement of, at least, general principles, even though detailed reasons might be, perhaps, wisely omitted. I should prefer to devote a special article to the question, so that each point might receive its proportionate share of attention, but this I cannot find time for this week. It would involve a consideration of the other question, Why do we wither? and that goes into chemical as well as mere physical changes which we seek to bring about. Suffice it for the present that I think I could show good grounds for never withering at a temperature much above 94 deg.—100 deg., unless a current of air passing over the leaf, by reason of the *dryness* and *velocity* of that air, produces a degree of *rapid evaporation* which by cooling the leaf when it comes in *wet* neutralizes the *extremely injurious* effect of the excessive temperature, and this latter neutralisation depends so much upon the air being of a low "relative humidity" (*i. e.*, being very dry) and also so much upon the leaf being *wet* not dry, and upon careful attention on the part of those in charge of the operation, that if a perfect degree of wither can be accomplished in say 5 hours, in the worst weather with the wettest leaf, with no higher temperature than between 86 deg. and 94 deg. without risks from careless; lack of attention, then, as the room will be vacant for the evening's pluck—the morning's being withered and removed, in the 5 hours—there seems to be no sufficient reason for preferring the more risky higher temperatures. Of course in competent, careful hands a high temperature (with a high velocity dry air current) may be fairly safe—it has yet to be proved so, and is against accepted views—but the additional anxiety and attention required would be a drawback to many, who would rather be not so tied to watching the progress of the wither. I was asked the question, as with a higher temperature than the Blackman system is at present worked at, four or five times the quantity of leaf might, of course, be withered in the same space and with the same appliances—provided the temperature could be maintained, at a reasonable cost in extra fuel, and provided the quality of the Tea were not damaged. Why run the risk and incur the extra expense in fuel? Where is the sufficient reason for doing so? With a temperature between 86 deg. and 94 deg., each "Blackman" in a room has, in *dry weather*, withered 66 maunds of leaf in 3½ to 4 hours: and in *wet* weather has, in the same room, done 33 maunds in the same time between those safe temperatures. Surely those quantities are good enough when the absence of risk and certainty of perfect quality in the "wither" are considered. Whilst speaking of this point, I would correct a mistaken impression or two which I have met with. Trays are by no means necessary with the system referred to. In many factories *no trays* are used. The racks are fixtures; in some cases made of tiers of Hessian cloth, in others, of open fabric woven like wire mesh, but made of hemp. In others they are of woven wire mesh; but in each case the fabric is stretched *from end to end of the rack*—and the leaf is swept off, or jerked off by tapping the under side. In some cases the fabric is stretched on rollers, and wound up, the leaf being spread at one end, and the fabric rolled out as the leaf is spread. The leaf in like manner is taken off by again rolling the fabric, which drops the leaf into baskets at the end.

Next, a factory having no loft above the Manufacturing Room, in many cases employs a good deal of its valuable space, for work such as boxmaking, &c., which can just as well be done in an adjoining building. If this space is thus cleared, and if racks are then erected therein for withering, and the necessary *cutcha* baffles erected in their proper positions, the ground floor is as good for withering by warm air current as any loft would be—and it is surprising how much leaf can be withered in a small space thus won for the purpose from an employment which can be just as well conducted elsewhere. Some factories are already so planned to wither *all* their leaf in spaces thus saved. When speaking just now of one propeller having withered 66 maunds of leaf in 3½ to 4 hours, I should have added, but in this case the racks were withered and emptied and re-filled from a store of leaf. Usually, sufficient space and rack area is provided to make one spread do for the morning's leaf, and one spread for the evening's as usual.

Another mistaken notion I have come across is, that all the leaf will get withered at the same time, and that the rollers won't then be able to work it off fast enough! This I fancy comes of the use made of the words "uniform wither" in the literature of the system. This notion is far from the case. Each *rack* should wither uniformly, so that the boys will not have to pick and choose *different* tiers of the same rack in removing the leaf. That would leave too much to the boys, and *cutcha* leaf might get mixed with withered leaf and spoil the "roll," &c. Each rack can be made to wither uniformly from top tier to bottom tier, by attention to details in erecting the "*chut*" and baffles. But the racks will wither *one after another* (by no means all at once) in their order as they stand *near* the warm air inlet, or *distant* therefrom—and thus there is *no fear* of withering too fast for the "rollers,"—and the current can, of course, be stopped at any time if there is any sign of this in dry weather.—*Indian Planters' Gazette.*

CEYLON TEA IN AMERICA: THE TEA COMPANY.

The following correspondence has been sent us for publication:—

New York, Nov. 7th, 1890.

Messrs. Darley, Butler & Co., Agents & Secretaries, Colombo.

Dear Sirs,—Since writing you on the 25th ultimo, we have your esteemed favour, 2nd ultimo, contents duly noted, also copies of the "Times" paper, containing the copy of Mr. Arthur's letter, and the remarks of the editor, &c. We find that Mr. Arthur, who has been the agent here of a man named Davidson, has gone back to England, and his "Sirocco Tea shop" is said to be closed, and is reported to have been a failure. We are quite averse to going into lawsuits, but it seems rather provoking, that we should be subjected to the attacks of a lot of people who seem to have no especial reputation at stake, and are backed up by [by a portion of] your press. We have taken up the tea business in good faith, but if your press and people intend to spend their time in vilifying us, the quicker we get out the better, as we are not at all dependent upon the matter, either financially or in any other way. It might be well to state to your people, that the only salary paid to anyone in this country, is to Mr. Pinco, and that only enough to keep him in *very* COMPARATIVE COMFORT. If the Company is a success we expect to make some money; if a failure, we will lose time as well as money. Mr. Grinlinton will no doubt ere this reaches you have explained his views about all matters here fully, and we trust no time will be lost in advising us, as to all the matters relating to the final settlements with your Co.—Yours very truly, (Signed) WATTSON & FARR.

P. S.—Enclosed we hand you copy of our last letter to Messrs. Darley & Butler, which will give you some points as regards the stock, &c., &c.

(*Extract from Messrs. Wattson & Farr's letter to Messrs. Darley & Butler*).

New York, Nov. 7th.

Messrs. Darley & Butler, London,

Dear Sirs,—Your esteemed favors 17th, 22nd, and 25th and 29th ult, duly to hand and contents noted,

We note that you are executing the order for tea, and some will no doubt come forward in due course. As to the statements and letters of Mr. Davidson and Arthur, we can only state that they are in the main lies, and that where any truth appears, it has been so perverted that it is made rather worse than lies. We have tried to find Mr. Arthur, but are advised that his "Sirocco Tea Shop" is closed, and that he has gone to England. The enterprise has proved an utter failure we are told. We have just sent the following cable—"Arthur's tea shop closed, has left country, notify *Times*, we hold them responsible for statements." While we are decidedly averse to enter into law suits, it seems rather hard that we should be subjected to attacks from parties who seem ready to go to any length to damage the prospects of the Company. We have received copies of your *Times* with full letters from Ceylon, and are writing the old Company in detail.

In regard to the surplus shares, after the holders of shares in the old Company are settled with and after the Company is floated and the two hundred thousand dollars ($200,000) working capital is raised by selling ten thousand shares at par and *giving away* to purchasers of same, *one, two, three or more shares of the surplus*, as may be necessary as bonus, commission &c., the balance is to be divided between ourselves and the parties interested with us in putting the Company through and pushing it to success.

And of course as the stock is *full paid*, and unassessible, we can do what seems best for the interests of the Company in giving away shares by way of bonus &c. or by selling stock for the benefit of the Company at any price that seems best and without subjecting the purchasers to any personal liability for the debts of the Company, and you explain to intending investors that they are not *subscribing* to shares of the Company but they are *buying* them out and out full paid up, and without any further liability for calls or debts of the Company.

As no salaries are paid to anyone here interested in the stock of the Company, excepting only to Mr. Pineo, and this only enough to support him in *very* modest comfort, we and our friends look for our pay "should the Company prove a success" in the surplus stock we may have been able to retain. If the Company fails, we get nothing, that is nothing but abuse, of which, by the way we seem to be receiving a fair share now "on account."

The $200,000 was not actually under-written, but could be realized at once under certain conditions. We have already placed some good blocks of stock and are placing same from day to day, in the meantime furnishing funds ourselves, relying upon being repaid in the near future by making a success of the Company.

In regard to your remarks about the people who are interested in the Tea Estate Company, we would say that we shall be pleased to have them take an interest in the matter, and think it may prove to their interest to take some shares in the Company. People interested as they are in the general welfare of Ceylon would do well to look into the matter carefully, and we would say to you, that as we wish to interest the Ceylon people of London in our Company, you may consider that you are at liberty to propose special terms as to number of shares they should have as bonus, upon buying some Treasury stock. This only applies to specially desirable people of which you must be the judges, as our policy is not to sell *any* stock except to those who will be of benefit to the *business* of the Company not solely selling out stock with the object of securing the capital required. Our plan may not act quite so quickly, but we will have a better assurance for a regular and increasing business.—We remain, yours truly,

(Signed) WATTSON & FARR.

New York, November 11th.

Hon. J. J. Grinlinton, M.L.C., Colombo. Ceylon.

Dear Sir—In accordance with the understanding with you when you were here that this Company should define its position with regard to selling pure Ceylon tea, unadulterated and unmixed, we now beg to advise you that this Company undertakes to sell only the pure and unmixed Ceylon teas—it being, of course, understood that our Ceylon and London Agents supply us with only the above articles.—Yours faithfully, for Ceylon Planters' Tea Coy., (Signed) R. E. Pineo, Secretary, for Ceylon Planters' Tea Company, (Signed) S. Ellwood May, President.

New York, November 11th.

My dear Mr. Grinlinton.—I enclose herewith a document as requested in your last letter to Messrs. Wattson & Farr. You will kindly note that my fellow-shareholders here have done me the honor to elect me—at this, the most critical time of the Company's existence—its President, which fully establishes Mr. Pineo's position as taken by him, as regards myself when he was last in Ceylon. You will no doubt remember that some of your journals criticised him at that time.

I also take this opportunity to state that the Company formed here into which the old Company is merged, has not only been carefully formulated by the Company's counsel, but that I have, individually, at different intervals employed three representative attorneys of this city to go through this whole affair and give me their opinion as to its being unquestionably fair, honorable, legal and in every sense honest to all concerned. When you take into consideration that the promoters do not, as usual, agree to put a certain amount of stock in the Treasury, but do agree to use enough stock to raise $200,000 in cash, for the Treasury, and in the interim get nothing for their labor, and are called upon to spend their own money and take many risks, you can well understand that they do not propose to permit the sort of abuse that one of your papers, without investigation or hesitating, published; although to those who are posted it is too absurd and ridiculous to injure any one. It would seem as though the press of Ceylon should have the interest of the planters at heart, and not publish something that might be copied by our enemies and the opposing interests, and thus have it appear that the situation of this company in Ceylon is as outlined in the "Times of Ceylon." Someone should make it plain to the journals of your island that our success has a very bad effect upon those who have been unsuccessful, and it arouses their petty jealousies and they are very apt to write libellous untrue statements, especially as in the case of Mr. Arthur who has left the country and cannot be made amenable to the laws.

I would also call your attention to the fact that when the promoters of this company have succeeded in raising the $200,000 in cash they then receive for their work, money expended, etc., what may be left of this paper, and must then spend years to make it pay good dividends as well for themselves as for all the other stockholders, before they get a particle of remuneration. When the planters of Ceylon thoroughly understand this whole matter we feel that they will do everything they can to aid this great undertaking which, whatever occurs to the promoters and workers here, must necessarily benefit them. I have recently called the attention of the Directors of this Company to the fact that our work here already has started up others in importing from London Ceylon Teas and selling them here. It gives me great pleasure to inform you that our plans are well received here and we are almost daily procuring new stockholders and good reliable selling agents.—I am, dear sir, yours very cordially,

(Signed) S. ELLWOOD MAY.

The Hon. J. J. Grinlinton, M.L.C., Colombo, Ceylon.

SATURDAY'S MEETING *RE* CINNAMON CHIPS.

AGREEMENT CANCELLED.

The meeting convened by Mr. Jardine for the purpose of considering whether the agreement entered into by cinnamon propriotors *re* cinnamon chips upon honour was to continue in force or to be cancelled

was held on Saturday (Dec. 13th) at 2-30 p. m. in the rooms of the Ceylon Association. Mr. W. Jardine was in the chair, and there were also present Messrs. S. R. De Fonseka, J. W. C. De Soysa, M. D. Cockburn, C. F. Fonseka and Jacob De Mel.

The Chairman said that the object with which he had convened the meeting was to enable them to decide as to whether the agreement that was signed by a large number of cinnamon proprietors should continue in force or be declared cancelled. There was a widespread feeling of suspicion and dissatisfaction abroad that a great many who had signed the agreement upon honour had not kept to their word—in fact their word of honor was to them a matter of far less value than the few rupees they got by selling chips. He had received letters from some, and in the course of his personal communications with others, he was assured that the majority of those who signed the agreement upon honour had not kept to it. In the face of this and of the fact also that the export of chips had not decreased but was quite equal to that of other years he thought it necessary to convene this meeting so that a decision might be arrived at as to what was to be done. Mr. Tudor Rajapakse's cinnamon estates had been leased, and there was no clause in the lease to refrain from exporting chips. Since that lease he had heard that several owners of cinnamon estates had commenced to scrape chips, and only the other day he received an enquiry as to whether it was a fact that the agreement was cancelled. He had certainly expected to have seen a larger attendance of those interested in this question than were present that evening. The small attendance showed a great lack of interest in the question and it also led one to believe that very many cinnamon proprietors had determined upon the course they had intended to pursue. When the question was first mooted and the agreement was entered into there was an impression prevailing in the minds of many that quite a quarter of a million lb. would be suppressed, but in that they had been disappointed, for they saw by the returns that there was no diminution whatever. It was now a question for the meeting to decide as to what course they intended to adopt in the matter, and in conclusion he invited the meeting for an expression of their views.

Mr. S. R. De Fonseka rose and said he had no doubt that the meeting would agree with what had been urged by the Chairman. It was a fact that many who had signed the compact had not kept to it, and the fact of their absence from the meeting showed that they took no interest whatever in the matter and that they were determined to scrape chips, for if they did take an interest in the cinnamon trade they would use their very utmost to increase the price of the spice. He believed that all interested in the spice would be thankful to Mr. Jardine for the interest he had taken in the matter, and for his part he was sorry to find the majority of their friends not inclined to support such a laudable object. He thought now that there was no other alternative for them but to scrape chips, for it would not do well for a few cinnamon proprietors only to refrain from scraping whilst the majority of them scraped away to their heart's content.

Mr. M. D. Cockburn followed, and said that it was quite clear to him that cinnamon chips should be placed in the same category as cassia. It was apparent to him that cinnamon chips did not go in opposition to ordinary quill bark, and that the two qualities were put to totally different purposes. This could be instanced by the range of prices at the August sales, when, notwithstanding the large exportation of cinnamon chips, the price of quill bark went up, so that it was quite clear that the chips did not at all go in opposition in the London market to the ordinary quill cinnamon. But the only quality that benefited and would benefit by the suppression of cinnamon chips was the superior quality. The price of that superior quality went up at the February sales and also at the August sales, but it only went down a trifle at the last sales. Leaving that out of consideration he saw no reason why only a portion of the proprietors should refrain from scraping chips whilst the majority had not adhered to the compact. It was quite clear that they determined not to keep to the compact, and therefore he thought the remainder should also be allowed to scrape away to their hearts' content. He therefore begged to move the following resolution, viz.:—"That in view of the widespread feeling existing that a large number of those proprietors who signed the agreement upon honor, not to scrape chips for two years, had not kept to the compact, it is considered expedient by those present at this meeting that the agreement should be cancelled."

Mr. S. R. De Fonseka seconded the motion, and it was carried.

A vote of thanks to the chair terminated the proceedings

CASSAVA IN FLORIDA.

(*Editor, "Louisiana Planter."*)

I see an article from a gentleman of your state on this plant, in one of our Florida papers. It is a plant in which I feel a deep interest—an interest which has no depreciation in my estimation after twenty years of cultivation and use. For stock of all kinds, in domestic use, that will eat the sweet or Irish potatoe, or any other root, nothing, I am satisfied, will compare with it for relish and nourishment; and as a feed for fowls no root can possibly equal it. In fact, the finest fowl yards imaginable can be made with the cassava plant. I have a stalk nearly three years old which has not been killed by frost, and could have had acres of such, as the frost does not kill here on my sand hill. The idea for a fowl yard is to plant an intended spot of any desired dimensions with the stalks which are used in short sticks for seed, and let it grow eight or nine months, at least, before turning in the fowls. The spreading boughs of the plant supply shade and protection from hawks, and the roots, as soon as the fowls learn where they are, will furnish half their feed. The roots usually grow at a slight angle—seldom perpendicular—and can be exposed to view by removing a little soil. If chipped a little, they are so white that the fowls will not be long in sampling them, after which they will do their own grubbing, and in doing so will get meat with their bread, as many worms and insects will be unearthed in securing the roots.

It is half feed for horses, mules, oxen, and milch cows. No beast ever showed more desire for corn or anything else than cows do for cassava roots, once accustomed to eating it; and it is the handiest thing to feed them on you could well imagine. A horse's appetite, if delicate, can be improved on it sooner than on anything else. I have made the finest bacon and lard largely on it and sweet potatoes that I have ever used. Corn and peas will do no better. It makes a fine reminder of oyster fritter if grated, seasoned well with salt and a little soda, and fried nicely. Fine pudding, custards, and bread can be made of it, and with fresh meats, as a stew, it is hard to excel when sliced thin and well cooked. No root is healthier as a diet. For starch it can hardly be excelled. As a feed simply for cattle and horses we would not on any account do without it. Florida, of course, is best adapted to this plant, except further south, but I believe the day will come when it will be found to be profitable anywhere that sugar cane will pay. I have an intended manual for farmers, yet in manuscript, on *cane*, *cassava*, *peas*, and *sweet potatoes*, which, if I were able to get into print, would give all the instruction on cassava that need to be known in all its cardinal features. I wish some pretty fellow would take pity on me and print a few thousand copies of it; possibly he and I, too, would clear expenses on it, and somebody else make a profit growing crops by its instruction. As to the yield of a cassava crop planted correctly and fertilized highly, it is something incredible. A gentleman in this county grew one root which weighed something over fifty pounds at about one year from planting the seed stalk. On a calculation of fifty pounds to the hill, each occupying a square of four feet, which gives 2,705 hills per acre, I get 135,250 pounds, which gives a fraction over sixty-seven and one-half tons per acre,

One cent per pound is what I have always sold the root for in the market, which would figure up the handsome sum of $1,352·25 per acre. But let us reduce it sufficiently in price and production to figure but one-fourth in dollars and cents, and we have left yet $338 06¼. This would, of course, be an extravagant reduction and could not fairly be allowed. But, extravagant as it may appear, I am soundly convinced of the fact that every acre a man can cultivate, which he has stock, fowls, and folks enough on the farm to consume, will yield him a profit por acre of $500 annually, while $50 for fertilizer and expense for the cultivation per acre will fully meet all the cost.

Midland, Polk County, Fla. S. W. CARSON.

CASAVE OR YUCA IN CUBA.

In a recent number of the *Planter* there is what appears to be an error copied from an exchange, which although perhaps of no great importance, should not pass unnoticed, for however trivial an error may be, it is always worthy of correction, and more so when it promises to become general. I refer to the manner in which the word *casave* is misspelt and misapplied. It has legitimately no direct reference to the plant I presume it is meant to designate, nor to its root, and it would be quite as proper to call wheat by the name of bread. Casave is an Indian name adopted by the Spaniards and means simply a kind of cake made from the root to which the word is being erroneously applied. Tho plant and its tuber are both called yuca in Spanish, (pronounced you ka, with the accent upon the first syllable,) and it has the same aboriginal origin as the misnomer. Throughout the British West Indies I believe both plant and root are universally called *manioc*, and to avoid confusion it would perhaps be well to adopt the same name in the United States, although the Spanish word is more concise, more euphoneous, and has the right of priority. Yuca was one of the four or five plants cultivated by the Indians of Cuba when the ill-requited Columbus discovered the new world, and strange to say, it was cultivated by these savages with far greater recognition of its requirements than is shown by their more civilized successors. This is abundantly evinced by the detailed description left us by one of the quaint authors of those primitive eventful days, and I regret not having the account at hand to enter more fully upon the subject. The aborigines made their casave by first taking off the outer and inner skin from the roots, rasping or pounding them to a paste almost, and spreading this in a thin layer upon a smooth flat stone previously heated, producing thus a sort of large, round wafer which could be kept a long time and enabling them to undertake long journeys, without preparing food upon the way. Casave eaten with honey seems to have been the staff of life of these inoffensive Indians, fit denizens of a land that harbored no wild beast nor venomous reptile, (not human,) and where even the honey bee had no sting, and can only defend itself by a square rough and tumble fight, which the unfortunate aborigine, more stingless yet, was too meek to attempt with his merciless invaders. The Indian, it is said, was long ago "improved off of the face of the earth," but the little Cuban bee still holds its own, bravely defending its home in the forest trees, its diminutive single entrance with a restless sentinel always in the breach, stopping the way against its imported adversary.

Casave, although in all probability very nutritious, can hardly be considered a delicacy, and the taste for it is apparently an acquired one: it is, however, still common in Cuba and often sold about the streets.

There are several varieties of yuca in which the root differs greatly, some of them indigenous and others probably imported. One called here the sour, or *agria*, is said to be the root from which the Indians in some of the islands manufacture poison for their arrows, but this seems at least doubtful. The leaf of the plant has a unique shape, and a yuca "patch" when about half grown is a pleasant sight. In this stage the lower leaves still reach the ground, the foliage forming a hemispherical mass, making rows of verdant domes, which are generally very regular and symmetrical in form. Where not exposed to frosts the plants may be left growing for several years, and the crop kept in the ground instead of being stored, with the further advantage of increasing all the while, but during the wet season the roots become watery and less palatable. One variety is quite bitter until about a year old, when it loses its unsavory flavor and preserves its edible qualities better in wet weather than other sorts. The yuca should undoubtedly be grown as a regular crop in the United States wherever the climate permits, for it is an excellent tuber, better probably, more productive and nutritious than the potato, resembling it in many of its other qualities. It is a good food for all animals, including man, and in Florida, or at least in the southern part, where it can be kept in the ground throughout the winter, it might be made the basis of a large industry in the manufacture of starch, of which it yields about 2 per cent, superior in quality to that in common use. Yuca starch resembles arrowroot very much, and, I believe, can only be distinguished from it in the form of the grain and by microscopic test, and may be used for the same purposes.

The process of extracting starch from yuca is very simple, and the requisite machinery, although differing from that generally used in the manufacture of the commoner kind, is neither complex or expensive. Starch might be made in Florida from this source upon as large a scale as sugar; also "British gum," which this root yields, I believe, by the simple addition of a due proportion of sulphuric acid, for no decoloration is needed. Yuca starch, if well washed, is undoubtedly superior for any purpose, and would meet, when its qualities are known, with a more ready sale at a higher price than the product of wheat and potatoes.

If any of your readers in that state wish to do so they can test this new industry in a small way at very little trouble or expense. The roots should be at least a very old, and from some varieties the yield will be greater after the second year's growth. They should be well washed and the two skins removed, particularly the outer one, for otherwise its finer particles will get mixed with the starch and are not easily separated. The roots may then be rasped or grated into a tub with a common hand grater made of punched tin, and for convenience of large size. To effect this operation on a large scale, a rasper may be made by securing sheets of punched tin upon two wheels made of board, and secured upon a wooden axle about five or six inches apart, to be turned by a crank while the roots are pressed endwise against the surface, in an inclined box of the same width as the rasper. The grated mass should be mixed with water and strained through a cloth fine enough to intercept all the particles of fibre. The residue may be washed until it has yielded all its starch and the refuse fed to the pigs. The starch will soon settle to the bottom of the vessel in which the liquid is placed, and then the water should be drained off. This should not be deferred too long, because a yellow deposit will then be found upon the surface of the starch, which must be washed away at some loss, although this will not be very great, for the mass is firm and compact. The starch should be again mixed with water, (before it sours, as it will if left too long,) strained and settled anew, in order to purify it. After this it has only to be spread in the sun to dry. If the yuca is of good quality, the product obtained will be a fine, white powder, which will go much further than the common article. Any farmer may in this way supply his family for a year with little labor.

The cultivation of yuca is simplo and requires no seed but the stalk, which, when dry, will also furnish fuel. It should be planted in rows about six feet apart and some appropriate crop sown between. The plant requires little moisture, and any excess if long continued is very pernicious. It should, therefore, be put into the ground toward the end of the rainy season, in order to give it a fair start before the winter droughts commence, and it is better to bank the land

into ridges before planting, for the double purpose of securing good drainage and a sufficient depth of loose soil for the free development of the roots.—SANTIAGO DOD.—*Louisiana Planter.*

ORANGE CULTIVATION:—THE SATSUMA.

Not many years back, any orange was simply an orange, with but one main distinction of variety, given as to whether it came from Messina or from Havana. Then the Havana oranges, regardless of size, shape, color or quality, were the top notch, and supplied the desires of those wanting the best.

The opening of orange culture on a commercial scale in our own Florida has changed all this, and practically driven the foreign fruit out of the market, save as poor crops at home or especial cheapness give it entrance. And our orange lovers have learned to distinguish, even in the North, between the many varieties received from Florida, and frequently between the same variety grown in different localities in the flowery state.

The writer well remembers his first acquaintance with one very distinct orange, the Mandarin type, which, from an abundant crop, strayed into the interior Pennsylvania markets a few years ago. The peculiar flattened shape attracted the eye, and a closer examination established the little fruit firmly in the favor of many who then first obtained it. The varieties of the species to which all of this type belong (*Citrus Aurantium nobilis*) are many, and much superior to the original form which pleased us. All possess the peculiarity of a loose skin, readily removed without breaking the skin of the interior segments.

The Satsuma—also called Oonshiu. Kii Seedless, etc—is probably the highest development of the Mandarin type. It is a pretty orange of the flattened shape of the class, but with a rougher skin than either the Mandarin or Tangierine. This skin is a reddish orange in color, and of peculiar leathery texture. The segments are but loosely adherent, so that the orange is readily eaten out of hand without spilling the juice; this, however, is characteristic of the species, as is also the peculiar looseness of the skin, which has caused these varieties to be called "kid glove" oranges in the market, from the facility with which the skin is removed. The impression that a good orange cannot be enjoyed gracefully will not be verified in the case of this type; the small, delicate segments can be separated and eaten without in the least soiling the hands or face. It is practically seedless; some specimens have one or two small seeds. Being without the rank and somewhat "fishy" odor of the type, it does not offend the nostrils, while it surely tickles the palate; the flavor is something surprising. I have frequently handed sections of a Satsuma, without comment, to friends not acquainted with it, waiting in silence the exclamation, sure to come: "Why it tastes like a cherry!" Sometimes the impression was that of a strawberry flavor, and I have noted two or three entirely distinct bouquets, if they may be so called, in the same fruit. To most people this orange is delicious, and other varieties, however good, lose their desirability in comparison with it.

The Satsuma is said to have been introduced into Florida about 1880 by Mrs. General Van Valkenburgh, who brought it from the island of Kiusiu, one of the Japanese group. Since, it has also been introduced by way of California, under its Japanese name—Oonshiu or Unshiu. There is no difference, although many claims have been made as to the superiority of the California sort. A critical comparison of the fruit of each shows them to be identical. It is another one of the many excellent things which our Japanese friends are discovering to us, and for which we should be grateful to the "Yankees of the East."

The tree is rather dwarf, and reclinate in habit, the branches drooping to the ground, resembling somewhat a Kilmarnock willow in this respect. It is entirely thornless, and marvellously productive—a tree planted but four years on the grounds of R. D. Hoyt, at Bay View, Florida, had on it 625 fruits early in December. This tree, which is illustrated herewith from a photograph, was $4\frac{1}{2}$ feet high, and about 7 feet through. This dwarf habit renders the fruit easy to gather, and the tree is exceedingly handsome and attractive in appearance, as may be imagined.

A remarkable feature of the Satsuma when budded on *Citrus trifoliata* stock is its hardiness, which is yet an unknown quantity, as none have ever succumbed, even where the ground has been frozen several inches deep. It is suggested that it may introduce profitable orange culture into Texas; trees of Satsuma set there several years ago have done remarkably well. Indeed, it is possible that in a sheltered spot the variety may be hardy as far north as Delaware, and by acclimation come yet more into the so-far-forbidden land for orange culture; who knows! With a hardy stock and a still hardier bud, the elements are certainly favorable for an extensive widening of the "orange belt."

The commercial importance of the Satsuma cannot be overestimated. The past winter one nurseryman disposed of his crop at $9 per box, wholesale, in New York, and the demand is certainly limited only by the supply, as the peculiar features of the fruit create a taste for it in any one favorably impressed at first, even where there is a dislike for the original Mandarin type. The expense of growing a crop must be less than for other varieties, so that even when the vastly increased production reduces prices, there will still be a profitable margin. The variety keeps fairly well, and packs very attractively, owing to its peculiar skin.

There has been extensive planting of budded Satsumas in Florida in the last two or three years, particularly since the trees have been offered by nurserymen at reasonable prices. A large production of the fruit may therefore be expected in the next few years, when all the country will have a chance to become acquainted with this fine variety.

Owing to the dwarf habit of the Satsuma it is admirably adapted to pot culture; moderate sized plants grown for two years only in greenhouses in Virginia have produced 40 to 60 fruits each, and make a very handsome display when set with the odly shaped oranges. Indeed, there can be but little question that this is one of the most valuable introductions of many years among citrus fruits.

J. HORACE MCFARLAND.

—*Farmer and Fruit Grower.*

VIRTUES OF THE PAPAW.

(*Editor, "Farmer and Fruit Grower."*)

It is probable that many people who have read of the singular qualities of the tropic papaw dismissed the subject as entirely too fanciful for serious attention. So I at first regarded the claim that a tough beef steak, wrapped in the bruised leaves of the papaw for a few hours, would become tender. However, after much delay, I decided to try if the fruit would not assist digestion, a reasonable deduction if the fruit or leaf would digest tough beef out of the stomach. I soon found the fruit a perfect remedy for indigestion. I made many inquiries but found nobody among the old settlers in Mana-tee and DoSoto counties who had heard such a claim for the papaw before. But at Fort Myers, Lee county, I found nearly all the old residents knew of it valuable properties. A doubt with me arose that if so potent might it not be dangerous in some way. But the necessity for a remedy for indigestion led to some months use of the fruit for that purpose (and I must say they are very agreeable "medicine"), and instead of any ill effects or necessity for their continued use as I fancied might result, they seem to have nearly, if not entirely, cured the chronic indigestion from which I have suffered for seven or eight years, and which grew worse, very perceptibly, each year, though good physicians were consulted and their remedies tried, with no permanent improvement. This sounds like a patent medicine certificate, but I do not see how I can draw attention to so important a matter in a better way. I wish to induce people to plant at least half a dozen of the trees for each case of in-

digestion and cure themselves. North of Fort Myers the plants or trees will need some protection from very hard frosts. But I have seen plants with half a bushel of fine fruit when not over four feet high, and not, I think, quite two years old. Such plants or trees can easily be protected in any part of Florida. The seed must be planted very shallow, barely hidden with the soil, and the plant set out when about one foot high. Where the soil is rich and the trees are to be protected from frost, they may be set as near as four feet apart, but more room would be better. I cannot learn how high they might grow eventually, the highest at Fort Myers being near twenty feet. Should they grow beyond any practicable covering, new plants might be started to take the place of those that get killed by passing out of shelter. For indigestion eat as much of the fruit at supper as you wish. It being better, where fruit is scarce, to make its use as near continuous as possible. The green fruit seems as effective (or more so), for indigestion as the ripe. The taste is much like that of the musk-melon. They are also called melon-papaws, and are, when ripe, from the size of a large hen's egg to that of a half-gallon measure. I am told that very differently shaped fruit grow from the seed of a single tree. Some of the trees have no branches, while others have from one to a dozen. Some writers say they have no branches, but many do. The tree is quite novel and ornamental; well worth all trouble of propagation as a novelty, or as a fruit, or a medicine, or to make tough beef tender. A South Florida party proposes to use them in canning Florida beef for market. I have not a seed or plant to spare at present. Almost anyone at Fort Myers could procure seed if called on for them and postage sent, or I will send seed in a month or two if anyone desires to test the matter. W. E. DRISCOLL.

Manatee, Fla., June 16, 1890.

INDIAN EXPORTS.—For the first six months of the current commercial year, namely, April to September 1890 inclusive, the export of certain staples in which we are interested, have compared with past years as follows:—

Export for first six months of three seasons:

		1888.	1889.	1890.
COFFEE ...	... cwt.	210,814	80,540	113,203
TEA ...	... lb.	42,326,269	44,301,931	44,309,341
CARDAMOMS	... lb.	109,978	77,024	51,307
PEPPER ...	... lb.	3,824,526	3,079,543	4,850,406
CINCHONA BARK	... lb.	646,022	263,133	401,628
COCONUT OIL	...gals.	775,437	792,747	387,851
CAOUTCHOUC	... cwt.	6,057	7,060	6,065

In Cinchona Bark, coffee and cardamoms, India is not making progress, while coconut oil has fallen very low this year in exports.

THE EFFECT ON PLANT-LIFE OF GROWTH AT HIGH ELEVATIONS.—From a communication on this subject by M. Gaston Bonnier, detailed in the *Comptes Rendus* for September, we extract the following results of comparative researches in experimental physiology made by that gentleman. Experiments made on two exactly similar plants, subjected to the same external conditions, showed that the functions in a specimen cultivated in an alpine climate are so modified that the amount of feeding-power as represented by assimilation and chlorophyllic transpiration is increased; while in a plant grown in darkness, respiration and transpiration seemed slightly modified or even diminished. Therefore, we may conclude, that during the short season at high altitudes, plants elaborate more freely the nutritive principles which are necessary to them than do corresponding plants of the same species at lower elevations. These experiments serve to explain the presence of the larger relative quantity of sugar, starches, essential oils, colouring matter, alkaloids, &c., which are found in plants native to a low elevation, when these are grown in an alpine climate, as all these products are directly dependent upon chlorophyllic assimilation, that is to say, on the greater vigour and sound health and nutritive power shown by the plants when at a high elevation.—*Gardeners' Chronicle.*

WESTLAND'S PATENT TEA-BREAKING AND SIFTING MACHINE is doing very good work, we are glad to learn, and there is considerable differences for the better between the teas turned out from it, and those of the different grades sifted by ordinary sieves.

BONE MANURE.—Professor S. Cooke, of the Poona College of Science, has patented a process for the manufacture of artificial manure from bones with the aid of raw materials found in every Indian village, and he has, moreover, proved its efficiency by practical experiments conducted on his own farms at Panchgani and elsewhere.—*Madras Times*, Dec. 18th.

VEGETABLE BUTTER.—A new artificial butter has made its appearance on the French market, which has already been heard of and, it is said, will be introduced in England. It is made from coconut oil, purified with alcohol and bone-black. The washing with alcohol removes the unpleasant aromatic principles and all tendency to rancidity. The washings are used for making artificial flavouring essences employed for liqueurs and confectionery. As the usual tests for margarine fail with the new counterfeit butter, analytical chemists are devising methods for identifying coco-butter (not cacao-butter) and cow-butter "cocotised."—*Chemist and Druggist.*

NORTH CACHAR, Nov. 22nd.—Gardens are shutting up very fast indeed. A little rain now would be a godsend, and would carry us on into December, but as it is, the quantity of leaf from toeles and in fact off all plants save indigenous, is almost nominal. Just starting the cold weather deep hoeing—turning up the ground in fine big lumps. Kitchen gardens are coming on, and there will be lots of English vegetables presently.—What a treat! Weather exquisite and all the more enjoyable after the awful past season. Not the least prospect of any rain. River steamer service apparently made up its mind to tread on the British planters' tail as often and as hard possible, and neither to beware or have a care. But *nous verrons.*

UTILIZATION OF BONES FOR MANURE IN BOMBAY.—There are 7 bone mills in Bombay and 1 at Thána. The latter is a large one, recently opened by Messrs. Croft & Wells. Bones are brought by itinerant dealers chiefly Musulmans, who employ the low-castes of villagers to collect them. These pretty dealers either sell direct to exporters, who employ the Bombay mills, or to larger dealers. It is estimated that some 10,000 tons are annually collected. The prices paid in Bombay vary from R35 to 45 per ton, but are rising. Conversion to one-inch bones costs about R2½ and to bone meal about R5. The prevalent prices last season in England for the prepared bones were £4-10 and £5 respectively. The imports by sea of bones to Bombay for export to England come chiefly from Cutch and Kathiawar. The rail imports are larger. The difficulty of collection in the Konkan has so far prevented much export therefrom.—*Madras Times.*

MM. FREMY AND VERNEUIL have presented another paper to the Académie des Sciences, Paris, on an improved method of manufacturing rubies. Instead of employing pure alumina, they now use chromated alumina, alkalised with carbonate of potash, which does not impair the purity of the crystals, while facilitating their formation and enhancing the beauty of their colour. Other improvements have been introduced, especially in lengthening the time of the reaction to a week or more, thus engendering hard, rhombohedral crystals of a large size. A gas furnace is used in place of a coke one, and thus a constant temperature of 1,300dg. C. can be maintained for weeks. Large crucibles, giving more than three kilogrammes of rubies at one operation, are now adopted. MM. Apport, the well-known glass-blowers, have allowed the investigators to make use of their furnaces and they have thus been able to prepare rubies which are in part sapphires, or crystals, red on one side and blue on the other, a phenomenon sometimes found in nature. The same charge will also produce crystals entirely red, and others wholly blue, perhaps owing to a difference in the oxidation of the chromium.—*Globe.*

GEM WASHING PLANT.

It has been pointed out to us that *Engineering* of April 25th last contained an account of "Diamond Washing Plant," with a series of engravings which afford a very good idea of the machinery employed in excavating, transferring and washing the clay deposit in which diamonds are found and which doubtless afford some idea of the kind of machinery now being sent out by the Ceylon Syndicate to be used at Rakwana. The illustrations show the Diamond Washing Plant for the Bulfontein, Kimberley and De Beer's mines, and they certainly show the elaborate nature of the machinery. From the letter-press we quote as follows:—

The whole machinery is erected on a high bank of tailings, levelled for the purpose and connected by an inclined tramway with the depositing floors below, on which the blue ground brought from the mine is caused to pulverise. The trucks containing the pulverised ground are hauled up this incline by an endless chain driven by intermediate gear from the same engine which drives the rest of the machinery. Arriving on the level bank, these trucks run along the tramway P and are tipped into the inclined screen A, through which the fine ground passes into the feeding hopper of the dry elevator B, whilst any lumps or stones too large to pass the screen are returned along the tramway Q for further exposure on the depositing floor. The fine ground lifted by the dry elevator is equally distributed between the two revolving screens U U, which are slightly inclined, so that any lumps too coarse to pass the mesh pass out at the ends of the screens, and are similarly returned to the depositing floor along the tramway S. The screens are generally formed of stout square steel wire, woven into a mesh with ¾ in. openings. This is in Bultfontein Mine, where the average size of diamonds is smaller than in the other mines. In Kimberley and De Beer's mines the mesh is generally 1 in. square. A spray of clean water is kept playing on the outside of the revolving screens, and a certain quantity is also fed into the hoppers of the screens where it meets the dry ground from the elevator, so that what passes the mesh of the screens is in the form of a puddle and is ready for treatment in the rotary machines E E into which it directly runs. These machines are each 14 ft. in diameter, being formed like mortar mills with an inner and an outer rim, the latter about 18 in. high, the former about 9 in. In the centre of the machine is a stout upright shaft resting on footstep bearing, and to this shaft by suitable attachments are secured eight radial arms extending so as almost to touch the outer rim of the machine. Each radial arm carries five or six vertical steel tines which are set to within about ½ in. of the bottom of the machine. The inlet for the puddle is by an inclined shoot from the apron under the screen discharging through the outer rim of the machine, whilst the outlet is over a weir cut in the inner rim. Since the effect of the revolving knives is to throw everything towards the outer rim, it follows that all the heavier particles tend in that direction, whilst only the light refuse passes over the central weir. The speed of the machines is about nine revolutions per minute. As it occasionally happens through careless feeding, or other causes, that diamonds are carried over the central weir, the second pair of machines, or safety pans F F, which are an exact duplicate of the pans E E, receive all the tailings from the latter, and treat them over again before they pass through the overflow of the safety pans to the wet elevators W W, which deliver them on to the spoil bank. At the top of each of these elevators are inclined screens which separate the coarse mud from the muddy water, the latter being returned down the shoots V V to the feeding hopper of the revolving screens, where it mixes with the clean water, and forms a puddle of proper consistency, a matter of the greatest importance as if the water is too clean light stones accumulate in the machines, raising the level of the deposit therein, whilst if the water is too muddy heavy stones may flow away in it, and in either case diamonds are liable to be carried over the weir.

In this connection, and as showing the great necessity for the introduction of machinery into our gemming districts, we may mention that the splendid catseye recently bought by a Moorman and valued at many thousand rupees, is supposed, for good reasons, to have been picked up by a workman of the Akuressa Syndicate, who, of course, bolted with it, leaving his balance of pay unclaimed. The announcement that a large catseye was in the market followed a few days after the disappearance of the workman referred to!

THE DUTCH BARK MARKET.

AMSTERDAM, Nov. 26th.—Cinchona.—The sales to be held in Amsterdam on Dec. 11th will consist of 4,536 bales and 135 cases (about 388 tons) Java bark, divided as follows:—From Government plantations, 521 bales, 48 cases about 50 tons; from private plantations, 4,015 bales, 87 cases, about 338 tons. Druggists' bark Succirubra quills, 135 cases; broken quills, and chips, 427 bales; root, 77 bales; officinalis, broken quills, chips, 62 bales; Ledgeriana, broken quills and chips, 2,725 bales; root, 996 bales; hybrids, broken quills and chips, 164 bales; root, 85 bales. Total, 4,536 bales, 135 cases.—*Chemist and Druggist.*

CEYLON UPCOUNTRY PLANTING REPORT.

PRIZE ESSAYS ON THE FERMENTATION OF CACAO—THE WISDOM OF THE WEST INDIES—BUTTERED CACAO—INGENUITY OF THE MOORMAN—HOW TO INCREASE THE WEIGHT OF CACAO—ADULTERATION.

Dec. 17th.

The Ceylon grower of cacao will receive a new sensation if he gets the December number of the *Tropical Agriculturist*, and reads the "Prize Essays on the Fermentation of Cocoa," taken over from the Trinidad *Agricultural Record*.

In Ceylon we too have had at times a rage for Prize essays; but anything that ever issued here could not be compared for a moment with this batch of practical beauties, which represent the wisdom of the West Indies. They are the nearest things as oracular and pretentious deliverances, to the lectures which the tea experts used to confound us with in the past, and which we all regarded with becoming awe. When I was done with the reading of these West Indian essays, and had noted the diversity of opinion which existed on the commonest matters of cacao curing, and how every man seems to do that which is right in his own eyes, and becomes an authority in consequence, I could understand how it was that a Commissioner was not sent here to learn our method, so that on his return he might establish some kind of principle among them. As it is they have methods which run from three hours to fifteen days; and the unfortunate who goes to these papers for practical guidance will be at his wits' end as to what course to follow. What these West Indian planters are suffering from is a plethora of knowledge, and the crying want among them is how they can best unlearn.

They are nothing if not scientific. Read a passage like this:—"The vinous fermentation in this vat (No. 1) induced by 'saccharomyces cerviciæ' is accompanied before removal probably by a commencing lactous fermentation, the ferment of which is 'penicillium glaucum

$$C_2\ H_{12}\ O_6 = 2C_2\ H_6\ O_3$$ "

This is decidedly high feeding, and there is more or less of it in all the essays.

It is hardly to be wondered at that a class of men who are capable of producing the above and understanding it have many trade secrets in connection with cacao curing. "Talisman," the *nom de plume* of one of the writers, surely carries off the

palm in his butter dodge, which is as ingenious as it is original. "On the morning of the sixth day," he says, "get some good quality of butter, wash out all the salt thoroughly, and rub the cacao with it. About three cents worth of butter is sufficient to each bag: the butter will give the cocoa an agreeable perfume without destroying the chocolate aroma, and will prevent mildew, one of the greatest enemies that cocoa planters and shippers have to contend against."

There is an appendix to this essay, and "Talisman" has a note on bittered cacao. He feels that this plan of his may not commend itself to the common intelligence, be received with derision, in fact, and like the Roman who appealed unto Cæsar, be appeals unto science. "The application of butter to cocoa &c. may excite the risibility of some people," he says, "but I have tested it well: and cocoa which has had butter judiciously rubbed on, can be shipped without fear of mildew to any cold or damp climate. The milk of the cow must have some latent virtues antagonistic to the little germs or microbes which infest damp cocoa."

In manipulating cacao, and doctoring it for the market, the Moorman has always been considered to be an expert. He discovered the use of the annatto dye for brightening up a dark sample, and now that this little dodge has been found out, and local buyers are in a position to checkmate it; his active mind has been at work again, and the same results which the annatto formerly produced, he can and does bring about by jak sawdust and lime. When this the latest plan is tripped up, be will devise something else. This kind of ingenuity, which is so marked a feature of the Moorman mind, has rather a deteriorating effect upon character, and has earned for the Lebbes and Saibos the reputation of sharp practitioners.

But as compared with our West Indian rivals the Moorman is nowhere; and be has but to transfer himself to Trinidad, or Grenada, to have his character renewed, and receive a moral whitewashing. What the Moorman does in the closet, the West Indian cacao planter unblushing carries out on the housetop. For example, the essay which received the first prize has the following passage, showing how weight of cacao may be increased, and colour heightened:—"The husk is certainly much more brittle in washed cacao, and does not therefore protect the bean as it should: it weighs also considerably lighter, but this might be made up by *recoating* the bean with a mixture of starch, gum tragacanth, and boric acid. This would be preservative, and improve the look of the cocoa very much: colour might be added if desired. If so it should be *red earth,* and not common colouring material, because earth coating is recognized as legitimate." Legitimate! who in the world recognizes red earth as a substitute for cacao? Just fancy a state of things where the above adulterations are current and advocated! The Moorman would starve among them, he would find his occupation gone.

It is pleasing to find one of the essayists protesting against the adulterations current, and pointing out what the result would be.

We know how the "Heathen Chinee" mixed his teas with all kinds of abominations, and how he has been driven out before the pure article which is produced in Ceylon and India. Ceylon cacao too has the highest place in the world's market; and while, doubtless, this is greatly brought about by our being in possession of the Caraccas variety, that it is pure like our teas, must also have an effect, for doctored cacao, like doctored goods generally, don't pay.

There is a great deal more in these essays that might be written on. But enough; let those who would learn more of cacao curing in the West Indies betake themselves to the *Tropical Agriculturist*.

PEPPERCORN.

KEROSENE as a therapeutic agent is highly spoken of by Dr. H. A. Gross in the *Medical World*. It cures almost all pains, from toothache to gout and rheumatism. It is deodorized in this manner: Take of coal oil, 1 pint; nitric acid, 1 ounce. Let it stand for a week and pour off the supernatant oil. It does not in the least smell like coal oil.—*Sugar-Bowl and Farm Journal.*

SALE OF ESTATES.

We learn that Agra-oya estate, in the Lower Dikoya district, has just been sold on a cash offer, the terms of which have not yet transpired. A well-known estate in North-East Matale with a small area of tea is also about to change hands:—the sales in both cases will mean fresh capital and fresh blood.

The Fiscal's sale of Hyndford estate, Nawalapitiya, —which is likely to become a very valuable tea property by-and-by—has been delayed for the present.

SAMBAS R WEST BORNEO, AND GOLD FINDING.

(From a Correspondent.)

As I see a notice in a late number of the *Observer* of the map of Sambas (west division of Borneo), it strikes me that perhaps you might like to have a translation of the account of Sambas to which the map was attached. "Bij dit artikel behoort een kaart" is the note under the heading of the leading article in the *Indische Mercuur* of 1st November last. It consists of a short but clear account of the present state of this portion of Netherlands India and a sketch of its history from the first setlement of the Dutch there in 1609 when the East India Company entered into a treaty with the Sultan of Sambas up to the presnt time. On my way to Java I met the then Assistant Resident of Sambas (it was then only an Assistant Residency), and we were fellow-passengers to Batavia on board a Dutch schooner, the "Katerina Kornelia," belonging to McLean, Watson & Co. and called after Mrs. McLean. Mr. Gibson formerly of Ceylon who married one of Colonel Watson's daughters was in Sambas a short time ago, and to the best of my belief he is there now. If this account of Sambas, with its description of the manner of collecting gold, will be of any use, I will send translation. [By all means send it to be given in *Tropical Agriculturist.*—ED. *T. A.*]

PLANTING NOTES.

MANA GRASS EXPERIMENTS AND STANLEY-WRIGHTSON TEA CHESTS; MR. ROGIVUE AND CEYLON TEA IN RUSSIA.

LONDON, Nov. 28.

At length there appears to be almost a certainty that the perplexing doubts respecting the several experiments made here with mana grass from Ceylon will be satisfactorily cleared up. We hear that the gentlemen who sent home the fourteen hundredweights of this grass, the failure of trials made with which my letters reported, has written home expressing the opinion that very probably the failure of his shipment to the Stanley-Wrightson Syndicate has been due to the fact that he had carefully removed all the stalks before making it. Of course, it is the stalk which contains the strong and long fibres; the leaf fibres only serve to mat the former under treatment. The two small lots with which the minor laboratory experiments were made with such success contained all the stalk of the grass. It is no wonder that Dr. Evans, the analyst employed, said he could not recognize the large consignment as identical in character with that he had at first had under his hands. A small lot of the stalk is to be sent home for distinct experimenting, and the Syndicate entertains no doubt that Messrs. Curtis & Harvey will give them a sufficiency of the one ton of the grass they are expecting to continue further trials with. You will understand that it would have been just as easy to make straw paper with the ears and leaf only of wheat, as to make mana paper from the blades of mana grass alone. It may be hoped, therefore, that ere very long it

may be possible for me to send you reports fully conclusive as to the future of the maua board industry which we hope to see commenced among you.

Just as this pleasing solution of its puzzling difficulty has reached the Stanley-Wrightson Syndicate, it has been in receipt of further most satisfactory testimony as to the efficiency of its tea chests lately arrived and now arriving home with tea from Ceylon and India. There has been shown to me this week a letter from Mr. Rutherford which informed the Syndicate that the tea belonging to the Ceylon Tea Plantations Company—a lot from far-famed Mariawatte—which had been received at home in its special chests, had sold this week for 10½d at the auction as against 10d for similar tea from the same estate which had come home in wooden chests. If such a result could always be relied upon, there would be no need to consider the extra cost of the pateut chests in comparison with those of wood. This important testimony by no means stands alone, as other recipients have written that the tea reaching them has arrived in splendid condition in the Syndicate chests. You will see that from both the above-mentioned circumstances, the prospect before the new tea boxes is brightening materially. A few improvements in the details of putting the chests together is all that seems to be now wanted to insure a really brilliant success.

Nothing seems to have been heard of Mr. Rogivue since he started again for the Continent and Russia. Doubtless he is by this time once more in St. Petersburg, and our sympathies are fully with him in his endeavour to secure co-operation with the Russian Minister who has taken the initiative in official action respecting the introduction of Ceylon tea. During the present week I met an old friend just home on a brief holiday from Shanghai, and on my asking him how he was getting on with his trade in China, he said :—" Last year was something too awful; but this year we are doing a really good trade." On my asking him how that could be with the English market for China tea so depressed, he remarked :—" We don't want the London market in the least ; Russia is taking every bit of the good tea we can send her and at good prices." When told by me of Mr. Rogivue's Mission, and of the recently reported action of the Russian Minister, my friend seemed to be considerably taken aback. After a few minutes of thought—evidently not pleasant thought—he observed :—" I don't believe the Russians will ever take to drinking the teas either of India or Ceylon. They can never suit the Russian palate, nor, even if they could do so, will the Russian system of making the infusion in samodvars, admit of either of those two powerful teas being used. I predict a Russian would at once spit out any Indian or Ceylon tea so infused." My answering remark was that time alone could show; but that at all events the arrangements sought for by the Russian official indicated a want of satisfaction with their present supply of China tea. On this my friend remarked that he should go to St. Petersburg himself, and see what was going on. He had evidently taken the alarm, in spite of his protestation that the growths of Ceylon and India could never prove acceptable to the Russian people.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Nov. 27th.

CINCHONA.—Nearly 200 bales of Guayaquil bark were included in today's sales, and a considerable proportion of this sold, with fair competition at steady rates : Fine thin quill 1s 5d ; good stout short and mossy 1s 1d to 1s 3d ; mossy chips, mixed with quill 9½d to 11½d ; ordinary rusty and damaged, from 9d down to 3d per lb. Several lots of Loxa also found ready buyers : Good bright quilly 1s 7d ; fair broken ditto 1s 5d ; small and broken 9d to 11d ; very mouldy and dull, from 2½d to 3d per lb. Of South American Flat Calisaya, 78 bales bright, but rather small were bought in. For the sound bark 1s 6d per lb is wanted, and an offer of 1s per lb was not entertained. There were also 16 bales (2,085 lb) cinchona from the West Coast of Africa (St. Thomas), in fairly good druggists' quills of a Calisaya character ; the best lot of this sold at 7½d per lb. For 5 cases very fine strong bold Java druggists' quill (Succirubra) 8½d was refused, though 9d would be accepted, while 38 cases good short East Indian druggists quill were bought in at the nominal price of 1s per lb.

CINNAMON.—At the quarterly auctions which took place on November 24th about 3,000 bales were placed in sale. The market was quite flat, and only about 925 bales found purchasers, at a decline of fully 1d per lb on good cinnamon, and from ½d to 1d per lb on ordinary grades.

ESSENTIAL OIL.—At today's auctions 20 cases Citronella in tins sold at ¾d to 13-16ths d per oz and 4 cases of Winter's Lemon grass oil were bought in at 2¾d per oz.

QUININE.—Prices have been easier this week, and we hear of sales of about 40,000 oz. of German bulk quinine on the spot at 11½d to 11¾d per oz.; while the Brunswick agent is said to have sold 25,000 oz. for April-March delivery at 12d per oz., but has now no more available at that price. The other German agents quote 1s 1d per oz. as the lowest price.

CROPS IN INDIA

SEASON TELEGRAM TO THE GOVERNMENT OF INDIA, REVENUE AND AGRICULTURAL DEPARTMENT, CALCUTTA.

Week ending 29th November.—Rainfall *nil* in Northern and Ceded Districts, Kurnool and South Canara ; good in Tanjore and South Arcot ; elsewhere very slight. Standing crops generally good except in parts of Nellore, Cuddapah, North Arcot, Chingleput, South Arcot, Tinnevelly and Malabar, where they are withering. Coffee affected by leaf disease in Nilgiris. Want of rain greatly felt in North Arcot, Chingleput and Tinnevelly. Locusts appeared in parts of the Ceded Districts, North Arcot, Nellore and Chingleput, but very little damage reported. Outturn of grains generally middling to average. Prices rising in eleven districts, falling in nine.

THE CRY OF THE CEYLON CACAO PLANTER.

How long shall we suffer supinely
  And bear the diurnal disgrace,
Controlling our passions divinely
  And wearing a smile on our face ?
Shall we palter with procrastination,
  Obeying Humility 's rules,
And suppressing our just indignation,
  Be set down as—fools ?

Is it right we should wait any longer
  In hopes we have suffered the worst ?
Think justice will prove herself stronger
  Before we are utterly curst ?
Can we hope for decreased degradation
  While decently docile and dumb,
When there settles on every plantation
  This criminal scum ?

Shall we hope with intelligent natives
  That Honesty soon shall o'erspread
The people : the code legislative's
  Penalties all become dead ?
May we trust that the deep concentration
  Of thought shall control every thief,
And keep him outside the plantation ?
  It passes belief.

Already too long we have tarried,
  There must be no further delay,
For the lawless ruffians have harried
  Estates by night and by day.
We cannot compete against numbers,
  For even Jupiter nods :
While the worn-out manager slumbers
  They prey on his pods.

If fear were true wisdom's beginning
  We might have some hope,
But Justice to strangle their sinning
  Has no proper scope.
She threatens, in case of detection
  In thieving and fraud,
o each felon her fullest protection,
  Free lodgings and board !

SUGAR PALM IN FLOWER.

One of the group of palms in the triangular space between Muirburn House and the banyan tree, Park Street, is reported to be in flower. The palm is *Arenga saccharifera*, and it may be of interest to watch the development of the flowering. From the *Treasury of Botany* we quote as follows:—*S. saccharifer*, the Areng, is a very common palm in the Indian islands, and on account of the variety of its products is of great value to the natives. The black horsehair-like fibre surrounding its leaf-stalks, called Ejoo or Gomuti by the Malays, is converted into cordage, employed for thatching, plaited into ornaments, &c.; a large supply of toddy or palm-wine is obtained by cutting off the flower-spikes, and this when inspissated affords an abundance of sugar, or when fermented a capital vinegar: considerable quantities of sago, of a rather inferior quality is, also derived from this palm, and several other products of minor importance.

COLOMBO TEA SALES FOR THE YEAR 1890.

The last public sale of tea to be held in Colombo during 1890 took place today, and brought up the total quantity of tea sold during the year to 6,114,525 lb., as compared with 4,627,762 lb. sold locally during 1889. Taking our shipment this year as 43* million lb., the quantity sold locally represents 14 per cent of this—the same percentage as was sold in Colombo last year—so that relatively to the increase of shipments the sale of tea in Colombo is not growing at all. The figures showing the quantity of tea sold in Colombo for the past three years compare as follows:—

	Offered.	Sold.	Percentage to total shipped.
1887-88 ...	3,579,047	2,783,429	13
1889 ...	6,841,529	4,627,762	14
1890 ...	8,867,510	6,114,525	14

Of this quantity sold locally, about 3 million lb. have been this year purchased for, and shipped to markets other than London, and the average rate paid for the whole of the tea for the year has been 43½ cts. The following table compiled by us will show the weekly quantities offered and sold, whilst the averages of each sale have been kindly supplied to us by Messrs. Forbes & Walker, the well-known Colombo brokers:—

1890

	Offered.		Sold.		Forbes and Walker's
Date.	Pkgs.	lb.	Pkgs.	lb.	Average. cts.
January					
8	2980	194715	2475	160463	45
15	3064	209491	2365	160022	45
22	2567	182529	1503	106675	41
29	1675	123064	1254	92153	42
February					
5	1563	102317	920	56936	41
12	2714	126740	1085	80923	44
19	2093	269324	1285	159698	45
26	1153	77178	1021	68247	42
March					
5	1012	68418	744	48559	40½
12	1624	113318	1093	77219	43
19	1946	135036	1829	58506	41
26	1920	134533	1136	75412	43
April					
2	1695	103935	1142	65960	42
16	3978	270091	2266	158358	39
23	2186	146630	1294	80077	38
30	1354	90893	1111	71511	39
May					
7	2008	139547	1761	121240	42
14	3142	200105	2140	129207	42
21	2784	186559	2498	161511	43
28	2918	194814	2453	163175	42
June					
4	2318	150240	2112	138701	47
11	3785	271295	3298	231814	45
18	3310	254764	2919	228432	47
25	2941	194641	2293	150289	46
July					
2	2728	193886	2093	146779	47
9	2294	154133	1902	128419	47
16	4059	370194	3453	231325	40
23	2350	173895	1502	110406	36
30	1514	108114	1167	83320	38
August					
6	1762	120261	1675	114903	40
13	2142	150665	1364	90157	39
20	1709	130230	1289	97767	38
27	1969	150773	1560	114705	41
September					
3	1801	123163	1654	114128	40
10	2177	172973	1918	157193	44
17	1936	140921	1640	116332	45
24	2637	184222	2439	171143	47
October					
1	1882	133865	1724	121920	50
8	3080	220871	2240	155245	49
15	3698	271065	1931	142026	44
22	2586	197469	1292	94419	39
29	1627	141562	816	73524	44
November					
5	2278	172153	1413	96567	42
12	3229	239375	1877	143454	43
19	3530	255484	1781	118629	41
26	2470	177294	1372	92805	41
December					
3	2837	197294	1622	102567	40
10	3104	235396	2070	159095	40
17	3764	286011	2329	167536	39
23	3081	226064	1762	124773	40
Total	122976	8867510	87882	6114525	

—Local "Times."

* It is in reality over 45 millions lb.—ED. *T. A.*

LANKA PLANTATIONS COMPANY, LD.

CACAO, COFFEE AND TEA.

The ordinary general meeting of the shareholders of the Lanka Plantations Company, Limited, was hed, on Wednesday, at the offices, 8, Old Jewry, E.C., Sir Robert Harding presiding.

In moving the adoption of the report the Chairman said that the advices which they had received from their manager continued to be of a character which would lead them to hope and believe that the current year would certainly not be worse than the year under review. He did not desire to be too sanguine, because they had had many disappointments previously; still, he thought they might consider that the company had now turned the corner. They now had between 1,400 and 1,500 acres of tea under cultivation, the average produce of which was about 300 lb. per acre. Therefore, they would have 450,000 lb to dispose of next year, which would, no doubt, give them very satisfactory dividends. The greatest economy had been exercised by their superintendent. The year's working had resulted in a profit of £7,292, which was sufficient to pay the dividends on the preference shares for the present and the previous years, and also 3s per share on the ordinary shares. That was a better state of things than they had had for some years past, and he believed it was the beginning of more prosperous times.

Sir Herbert B. Sandford seconded the motion.

Mr. Bayford pointed out, in the course of a long speech, that it was unwise, in the present position of the company, to pay a dividend, but that it would be far better to reduce the debt of the company.

The Chairman having replied, the report was adopted.—*H. & C. Mail* Dec. 5th.

A VISIT TO CHILAW:—COCONUT CULTIVATION.

Our chief point has reference to the steady extension of cultivation wherever there is unoccupied ground along the fifty miles of road to Chilaw. We saw evidence of a change, since our last visit in September 1888. The fruit-trade—specially in plantains—between the Chilaw district and Colombo is growing in importance. All round—in and about—Chilaw town, the little fields of tobacco are very well-defined, the young plants being at present the objects of great care in watering morning and night. Beyond Chilaw, the new Telegraph wire is conspicuous on its way to Puttalam; when carried to Mannar, it will give an alternative line—a very important matter—between that point and Colombo.

A wide span is required to carry the wire over the Deduruoya; but we found that river—the next to be bridged we should think—far less in depth and breadth of water than we had anticipated at this time of year. This reminds us to remark on the neatness and yet great strength of the new Toppu girder bridge beyond Negombo: it rests on substantial iron piles screwed into the bed of the Mahaoya. The bridge bears the name of the respected Factory Engineer, and is a great improvement (though rather narrow inside) on the old wooden bridge, and especially on the ferry we crossed two years ago.

Finally, we have to remark on the important scene of Coconut Cultivation in the Rajakadaluwa district north of Chilaw. Mr. G. D. Miller, the pioneer, and the sole European planter who has ventured down there, has now demonstrated to the satisfaction of some of the best authorities in the island that the climate and soil are well suited for coconuts. Mr. Miller's own four and five years' old palm trees, notwithstanding the prolonged drought after the South-West monsoon of this year, are most promising, and this gentleman will shortly have 1,000 acres planted altogether, on the group of plantations under his care. There is no reason, we believe, why the coconut palm should not be planted and succeed alongside the thirty miles of road to Puttalam. The character of the soil makes up to a great extent for the short rainfall. Mr. Jardine who rather shook his head on his first visit with us in September 1888, a few months ago on a second visit, quite changed his opinion and he has reported very favourably of the prospects of the Rajakadaluwa and Toynbee plantations. Here then is a planting industry established in a remote district, mainly through the indefatigable exertions of one man, and the amount of good he (with his fellow-proprietors) have done to the poor people around him, both Sinhalese and Tamil in affording them welcome employment and in stimulating them to give more work to their own gardens, cannot be overestimated. All success, say we, to Rajakadaluwa and its spirited, hardworking proprietor Mr. G. D. Miller.

AGRICULTURAL COMPANY OF MAURITIUS announce an interim dividend of 1s per share, or at the rate of 10 per cent. per annum, for the half-year ending Sept. 30th, payable, tax free, on Dec. 24th at the Alliance Bank.—*O. Mail*,

THE KOLA NUT.—The wonderful stories that have been told of the properties of the kola nut are more than confirmed by our Consul at Bahia, who has written a special letter to Lord Salisbury on the subject. The West African carriers at that port, who use kola, and carry the bean wrapped in banana about their persons, are not physically speaking superior men to the Brazilian negro; yet the African, through constantly masticating kola can, we are assured, endure fatigue which no Brazilian traveller can withstand. Where it takes eight Brazilian negroes to carry a load with difficulty, four African porters carry it cheerfully, singing and chanting as they trudge along, each with a bit of kola bean in the mouth. As a rule the kola-eating African gangs who labour at the hard task of unload ing vessels earn, we are told, twice as much as their competitors. The beans, which are described as unintoxicating and in no way injurious, are said to act as a nutritive, and quench thirst; yet they are not strictly a stimulant. The supply at Bahia comes from Lagos. It is best soon after it is gathered, and is sold according to freshness at twopence or threepence for each bean. It appears that the attention of the Government of India has already been called to the extraordinary properties of kola nuts, and practical information has been supplied to them from the authorities at Kew.—*A. F. Press.*

THE I. M. S. "INVESTIGATOR" AND THE COCOS ISLANDS.

The I. M. S. "Investigator," which is now in harbour, has recently been surveying the Great and Little Cocos, islands to the North of the Andamans, which must not be confounded with the Cocos, or Keeling Islands, to the South of Sumatra. Both islands are uninhabited and belong, we believe, to a Rangoon Barrister who has leased them from Government for fifty years as a speculation. Forty years ago or more an attempt was made to effect a settlement on the Great Coco, which is 6 miles in length by 2 miles in breadth, by three Europeans, one East Indian and eight Burmese; but the project had to be abandoned as seven of the party succumbed to fever. The island is surrounded by a strip of white coral beach, on which grows an almost continuous belt of coconut trees, whence its name is doubtless derived. Within the belt is nothing but forest and jungle. Up till now it has always been supposed that neither of the islands contained any fresh water. In 1874 a very careful examination was made, but without any drinking water being found, although it was said by some natives that a good tank did exist somewhere. Curious to say, the officers of the "Investigator" have now discovered fresh water on both. One officer also bagged a strange specimen of a teal, which has been sent to Calcutta for identification. Dr. Alcock, the ship's Naturalist, during the time that he has been on board has been paying special attention to marine biology. a science which may be said to be still in its infancy, Dr. Alcock has made some important discoveries both during last season and this. The most interesting discovery, perhaps, is that of highly luminous deep sea crustaceans, which were dredged at a depth of 3,000 feet on the voyage round from Bombay. According to a correspondent this is believed to be the first positive proof that the source of light in the dark abysses of the ocean is the self-luminosity of the animal inhabitants. A large prawn lying in a bucket of sea water on deck was observed to be shining brightly, and, being seized, it emittes copious clouds of phosphorescence from the orificed of the genital glands. By the light of this luminous secretion Mr. Alcock was abl , though otherwise in perfect darkness, to see the details of the interior of the bucket, and his own hands as well as the position and shape of the animals in the bucket. After the removal of the animal the water remained luminous for some time. Other crustaceans were also luminous, but to a less extent. Dr. Alcock's name as a marine biologist is likely to be heard of frequently in the future, for he has the most favourable opportunities of pursuing his work of scientific research. The Government of India has provided him with expensive apparatus necessary for dredging the deep sea bottom, and the Bay of Bengal as a field for investigation has so far been hardly touched except round the coasts. It can hardly be doubted that its tropical waters contain many wonders, which so far have never seen the light of the sun.—*Madras Mail*, Oct. 19th.

PROGRESS IN THE NEGOMBO DISTRICT.

COCONUT AND IRRIGATION—COIR FIBRE—OIL, &C.

We congratulate Mr. Akbar, the spirited proprietor of Katukande coconut plantations (600 acres in cultivation) on the banks of the Mahaoya, on securing the services of Mr. Wm. Lawrance late of the Badulla district, as his Engineer and Manager. Mr. Lawrance is a practical engineer trained in one of the first establishments in Aberdeen, and he has also had prolonged experience as a planter. Katukande is a very important charge; for besides the estate, Mr. Akbar has a large Coir Fibre Mill employing some 400 people on the property, and it is also the scene of most

interesting Irrigation experiments, the pumps being worked by a 30 horse-power engine. It is now Mr. Akbar's wish to erect an extensive Saw-mill, the machinery for which is all ready for Mr. Lawrance to see put together.

Apart from Katukande Mr. Akbar owns the Hunupitiya Oil Mills in Negombo under the care of Mr. James Brown as Engineer and which do an extensive business.

Furthermore, this enterprising Ceylonese gentleman is just maturing his plans to run a paddle steamer early next year between Negombo and Colombo, the passenger rates by which are likely to be so moderate as one, half and quarter rupee each, according to class. We heartily wish all success to the steamer, to Katukande, its mills and pumps, to Hunupitiya and to Messrs. Lawrance and Brown in Mr. Akbar's service.

SENDING TEA DIRECT TO LONDON.

Among the various proposals put forward lately to improve the present state of the tea trade, none strikes one as so obviously absurd as that of sending all tea direct to London. That London at present rules the other markets is admitted by even the men who suggest this, "Proprietor" in his very practical letter touched the root of the matter when he remarked:—"I am of opinion that so long as an increasing quantity of tea is yearly poured upon one (the London) market, the sterling price for the same is not likely to rise! This to every one with the slightest knowledge of supply and demand is obvious. With the present state of prices can the producer afford to ignore a single outlet, Calcutta, Bombay, Australia, New Zealand, the Cape, or any other, no matter how small the quantity wanted? Is it not to his interest to encourage competition from every market in a place where he has at least some slight touch? The idea of a small proprietor being left to the tender mercies of the London market with the entire crop going there—no competition—is suicidal. The saving of importers' profit is brought forward, but what guarantee have we that it would reach the proprietor. It is extremely doubtful if these profits are worth having. I am told that one has only to know the names of the many firms who have given it up during the last six years,—one very notable case fresh to memory—to be sure that in this branch, as in every other, the keenest competition exists. Added to which there is no secrecy about it, as the prices of all teas sold in public auction in London appear in the catalogues, many copies of which are weekly sent to India to all large firms. Enquiring the other day in order to find out what was being done to push Indian tea, I was informed that most of the large firms in Calcutta have a "buyer," who, during the off season, is sent to various places, London, Australia, New Zealand, America (this last, my informant added, will certainly increase its consumption) in order to study the different requirements, and push Indian teas generally, by sending suitable grades, and that these are the men who are reported to "come out" every year to import tea, and the only people, so far as I could learn, who are doing anything to open the fresh markets we so much need.

Ceylon men certainly set an example to us, in the way that the producer is always ready to respond to any effort in the above direction. India seems content with the comforting idea that at some future date Ceylon is "going out." The tea certainly has been leaving the country in alarmingly increasing quantity for the past five years, and many gardens in India seem nearer "going out" point than their despised competitor. As a producer, I would certainly prefer to sell my tea at a market where competition from all centres comes in; and it does not strike me as likely that those above mentioned will send to London for what they want. In any case the increased charges, freight, etc., would not come out of the consumers' pockets, and it is certainly not desirable for the supplying of these places to fall into the hands of one or two of the largest owners or agents. I have not yet found a producer with a thorough knowledge of both markets advocate it, although the steady sellers in Calcutta number among them many names of men who have not the reputation of making mistakes. It is reported by experts both in London and Calcutta that this year's crop is a very poor quality one, and I suppose this must be accepted, as it is borne out by the continual bad weather reports from nearly all parts. This, together with the high exchange (how we used to grumble at 1-4½), is said to account for the exceptionally low prices, and it is to be regretted that both causes should come together. Probably economy could be effected in small ways, and it would be well for all interested to look to his, but one fact remains that until London is relieved from the weight of tea that at present goes there, prices cannot rise to any extent. Fresh markets must be opened, certainly none abolished, or many of the smaller gardens will either be closed or become absorbed by their larger neighbours. A remark I overheard the other day struck me rather forcibly: there are some gardens in India that produce such tea as will never increase the consumption, and by quantity only help to reduce prices, and if some of these did go to the wall, it would not be an unmixed evil.—*Englishman.*

THE TOBACCO INDUSTRY IN NORTH BORNEO.

You will, I daresay, have noticed by the Singapore and other papers, during the last two years, that considerable attention has been attracted to the Western Division of Dutch Borneo, principally on account of the numerous gold and diamond mining concessions taken up there, and also in connection with the concessions or contracts of land for tobacco planting, these latter being almost entirely confined to the Sambas district of Western Borneo. It may interest your readers to hear what has been done in the way of planting there.

As in the Straits and British North Borneo, so in Sambas, the credit of giving a start to planting belongs to the ex-Ceylon Planter. Towards the end of 1887 a Syndicate was formed by a few gentleman in Singapore, to apply for and take some gold mining concessions in Sambas, and young W——was sent across to get the necessary documents signed. While in Sambas, the Sultan, hearing he was a planter, advised him to have a look at the land in the Sangauw district, some four to five day's journey up the Sambas river, and where the Sultan had been experimenting with Liberian Coffee, Pepper, and Cacao. W——acted on this advice and was so much taken with the quality of the soil and the general appearance of the country that on his return to Sambas he applied for 10,000 bouws of land in the Sangauw district for the Syndicate he represented, and it was granted on fairly reasonable terms after a few months.

Samples of the rich, chocolate-coloured soil brought over by W——to Singapore were shown to practical Sumatra tobacco-planters, who without exception expressed the opinion that better soil for tobacco could not be desired, and the only doubt was as to whether the climate of Sambas was suitable or not.

In a short time a Syndicate was formed in Singapore for the purpose of carrying out the experiment on a proper scale of, say, 80 to 100 fields, and an experienced Dutch Deli planter was engaged to carry out the work.

The first opening was made at "Simedoem," 12 miles by cart-road from the Kampong Sangauw, where river carriage ceases, the card-road being constructed partly by the estate and partly by the Sultan. Nothing could be finer than the soil on this estate, and the work of clearing, roading, and draining &c., was carried out in the most approved Deli manner. Here I may remark that from what I have seen and heard the general run of such work as roading and

draining, carried out on tobacco estates in Deli and elsewhere, would be considered much too elaborate and expensive by the generality of Ceylon planters. The year 1887-88, when the land in question was selected, was an exceptionally dry one, but unfortunately the year of the above experiment, 1889, was abnormally wet, and this, added to the fact that the estate was at an elevation of 1,000 to 1,200 feet above sea level, and was shut in on three sides by hills, causing the morning mist to lie long in the hollow, all told against the success of the experiment which, in fact, as far as this particular spot was concerned, was pronounced a failure.

In the meantime, however, acting on the advice of their Manager, the Syndicate had applied for several lots of land on the banks of the Sambas river, and within a few miles of the town of Sambas, and on one of these contracts an experiment on a much smaller scale was tried, with the result that the tobacco produced was pronounced by competent judges to be equal to the best Deli produce. As you can understand, all this experimental work had cost the syndicate a considerable amount of money, and they wisely decided to lie on their oars for a little to see what the result was from the first planting by a Dutch Company which had followed in their footsteps on the lower alluvial land.

I had the pleasure of meeting the Managing Director of the Tabak Maatschappij, Sambas, Mr. Leyssiens, an old Deli planter, just after he had visited the Serabe estate belonging to the Company, and he expressed himself as perfectly satisfied with the quality of the tobacco produced, and the prospects of his Company and tobacco planting in Sambas generally, provided the labor difficulty could only be satisfactorily arranged. It is the quality and not the quantity of the labor which constitutes the difficulty, as in nearly every batch of Chinese brought over from Singapore you are sure to find some black sheep turned out of Deli, and they very soon manage to contaminate the raw cooly fresh from China. Severe measures must be taken with such men, and I think there is every hope that such will be enforced, as the new resident for the Western Division of Borneo, The Hon. S. W. Tromp, was for several years a Controlleur in Lankat-Deli, and thoroughly understands dealing with refractory Chinese. Surprize has been expressed over here at the Singapore Syndicate not going ahead and opening up land; but I think they are quite justified in lying back a little now, having already, in a very plucky manner, sunk a considerable sum of money in the country, and, as they hold the very pick of the land considered suitable for tobacco-planting, directly other estates are opened up their land will be very much increased in value, and they will then find no difficulty in disposing of it to advantage, or getting others to provide the necessary capital for opening on a large scale. I sincerely hope, and have every reason to think, that they will not only get back the money already sunk in the country, but derive a handsome profit as well; and they well deserve it, and it will be entirely owing to the pluck of the Singapore Syndicate, who risked their money at first, if Sambas ever proves the rival to Deli some expect it to be.

I hear that several estates are to be opened up this year, and there is now direct communication with Singapore by steamer once a month, and also per Government steamer with Pontianak once a month. The terms on which planting contracts in Dutch Borneo are held are as follows:—The land is granted on a 75 years' lease by the Sultan and Rulers and their Chiefs, with the approval of the Dutch Government, and the contractor binds himself to pay the following rent, viz., one guilder per bouw on one-fifth of his contract at the end of the first year; one guilder per bouw on two-fifths at the end of the second year; and so on up to the end of the fifth, when he pays one guilder per bouw on the full extent of the contract. As there are now from 25 to 30 contracts in force in Sambas, averaging 10,000 bouws each, you can understand that the Sultan of Sambas will derive a very handsome and yearly increasing income from this source alone. The whole of the Sambas territory, you may say, has been taken up either as planting contracts or gold-mining concessions, the Sultan's royalty on the latter being 2½ per cent. of the gross minerals produced.

The Sultan of Sambas is a courteous, educated native gentleman, having been educated in Java, and he rightly enjoys the full confidence of the Dutch authorities. The advancement of Sambas from the nest of pirates it was not so very many years back to what it is now is entirely due to the Sultan's just and enlightened rule under the guidance of the Dutch Government.

—Local "Times." KAMBAR.

A "SCRUB EXTERMINATOR" has been invented in Melbourne; and a sample of the preparation—which, while killing the plants, ought not to injure the soil—has been sent to the Government of Madras for trial.

"COORONGITE" is a mineral substance very like india-rubber, and was originally discovered some years ago near Salt Creek, a tributary of the Coorong inlet at the mouth of the Murray River in South Australia. It is found in swamps and hollows of the sand. Some believe it to be of vegetable origin, and a species of gum or lichen, while others consider it a residue of petroleum. Boreholes have lately been sunk on the ground, and a depth of 500 feet attained, but without striking any oil.—*Globe.*

CEYLON EXPORTS AND DISTRIBUTION 1890

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1890 B'nch & Trunk lb.	Tea. 1890 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1890 cwt.	Coconut Oil. 1889 cwt.	P'bago. 1890 cwt.
To United Kingdom ...	54962	121	55083	7930606	42828743	11334	154819	1069837	237635	94151	118029	159843
,, Marseilles	157	...	157	12500	1462	80	...	105960	8800	3000	...	...
,, Barcelona	..	...	...	...	1150	...	...	45000		...	..	...
,, Genoa	12	...	12	...	3554	...	...	100765	39424	4330	3482	1134
,, Venice ...	118	232	350	70412	2455	...	...	11100	11200	200	401	...
,, Trieste	7941	97	8038	546	4100	...	7393	8900	20048	18333	10239	...
,, Odessa	32	...	32	...	275	...	...	...	...	8062	5415	...
,, Hamburg	296	...	296	730	43026	913	1131	297882	91972	19381	9071	35232
,, Antwerp	19	20	39	217919	1600	...	...	22000	11312	1565	1492	16545
,, Bremen	20	...	20	...	25578	151	.	29948	...	...	..	6895
,, Havre ...	...	100	100	..	4761	8	...	10000	...	2007	4578	...
,, Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
,, Africa	16	...	16	...	40382	...	...	5000	...	17	34	...
,, Mauritius and Eastward	299	333	632	...	99530	498	..	28500	...	41265	7270	...
,, India	1609	718	2327	...	128069	...	197267	7220	...	88129	43074	374
,, Australia & New Zealand	11630	1306	12936	...	2552861	9	40	8474	4256	1821	1944	406
,, America	1924	...	1924	401893	201098	1840	4956	89228	...	58100	101072	150457
,, Stockholm	...	...	...	...	1703	...	...	...	...	...	...	...
,, Constantinople ...	...		...	.	3122	...		...	...	...		...
Total Exports from 1st Jan. to 31st Dec. 1890	79038	2927	81965	8655990	45943469	14888	365606	1839814	435847	340371		372502
Do 1889	81416	4583	86117	9435715	33337145	18742	295095	2279284	518536	327652		452224
Do 1888	130469	8814	139283	13251120	23670268	12936	260443	1657332	465886	365852		235764
Do 1887	164138	8166	172552	11996039	12938040	15915	329474	1489034	319972	284607		230635

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, December, 18th 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	{ Slightly softish to good { Hard bright... ..	£5 10s a £7 10s
Yellow ...	Do, drossy & dark ditto...	95s a 110s
CINCHONA BARK--Crown per lb.	Renewed	4d a 10d
	Medium to fine Quill ...	6d a 9½d
	Spoke shavings	3d a 9d
	Branch	1d a 3d
Red	Renewed	2d a 10d
	Medium to good Quill...	4d a 9½d
	Spoke shavings	2d a 5d
	Branch	1d a 3d
	Twig	1d a 1½d
CARDAMOMS Malabar and Ceylon	Clipped, bold, bright, fine	1s 8d a 3s
	Middling, stalky and lean	10d a 1s 6d
Alleppee	Fair to fine plump clipped	1s 4d a 3s
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, bri'	1s 6d a 3s 3d
Long Ceylon	Middling to good... ...	1s a 2s 3d
CINNAMON 1sts	Ord. to fine pale quill ...	7½d a 1s 5d
2nds	,, ,, ,, ,, ...	7d a 1s 3d
3rds	,, ,, ,, ,, ...	5¾d a 1s 2d
4ths	Woody and hard	5½d a 10d
Chips ...	Fair to fine plant... ...	2d a 7½d
COCOA, Ceylon	Bold to fino bold ...	110s a 115s
...	Medium	95s a 101s
...	Triage to ordinary ...	55s a 85s
COFFEE Ceylon Plantation	Bold to fine bold colory...	110s a 112s 6d
	Middling to fine mid. ...	104s a 107s 6d
	Low mid. and Low grown	99s a 104s 6d
	Smalls	96s a 103s
Native	Good ordinary	87s a 92s
Liberian ...	Small to bold	85s a 93s 6d
East Indian ...	Bold to fine bold... ...	105s a 115s
	Medium to fine	100s a 105s
	Small	95s a 102s
Native	Good to fine ordinary ...	87s a 92s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£14 15s a £27 5s
Stuffing ...	Coarse to fine	£7 a £25
COIR YARN, Ceylon ...	Ordinary to superior ...	£15 a £30
Cochin ...	Ordinary to fine	£15 a £40
Do ...	Roping fair to good ...	£12 a £16 5s
COLOMBO ROOT sifted ...	Middling wormy to fine...	18s a 27s 6d
CROTON SEEDS, sifted ...	Fair to fine fresh... ...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold... ...	50s a 63s
,,	Small and medium ...	26s a 39s
Rough	Fair to fine bold	18s a 25s
,, ...	Small	16s a 21s
GUM ARABIC, Madras...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	10s a 12s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES, pale ...	Good to fine picked ...	10s a 11s
	Common to middling ...	8s 9d a 9s 3d
	Fair Coast...	9s a 9s 6d
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fiue heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	11-16d a ¾d
LEMON GRASS ...	,, ,, ,, ,,	1⅜d a 1½d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy }	4½d a 4⅝d
Alleppee & Cochin ,,	,, good ,, }	
Tellicherry, White ...		1s a 1s 1d
PLUMBAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright ...	5s a 9s
RED WOOD	Fair and fine bold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to good flavor ...	£30 a £58
Do. chips ...	Inferior to fine	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	4d a 8d
	Fair middling medium...	3d a 5d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	16s a 18s
Do. ...	Mixed middling [bright	15s a 16s
Do. ...	Bulbs	10s a 12s 6d
Cochin ...	Finger	16s a 17s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	15s a 22s
2nds	Foxy & reddish 5 a 8 ,,	12s a 16s
3rds	{ Lean & dry to middling { under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Soscotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	36s a 42s
	Ordinary and middling...	28s a 31s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb }	Good and fine bright ...	3⅞d a 4d
	Common dull to fair ...	3¼d a 3¾d
Stems...	Common to good ...	¾d a 15-16d
COCULUS INDICUS ...	Fair ...	12s a 13s
GALLS, Bussorah & Turkey ₩ cwt. }	Fair to fine dark blue ...	52s 6d a 58s 6d
[cwt.	Good white and green...	40s a 47s 6d
GUM AMMONIACUM per	Blocky to fine clean ...	40s a 100s
ANIMI, washed, ₩ cwt.	Picked fine pale in sorts,	£13 a £14
	part yellow and mixed	£10 a £12
	Bean & Pea size ditto ...	£5 a £8 10s
	amber and red bold ...	£10 a £11
scraped...	Medium & bold sorts ...	£5 a £7
ARABIC E.I. & Aden .. per cwt.	Sorts	32s a 70s
Ghatti ...	Sorts to fine pale ...	22s a 57s 6d
Amrad cha	Good and fine pale ...	70s a £5 17s 6d
	Reddish to pale brown ...	25s a 55s
ASSAFŒTIDA, per cwt.	Clean fair to fine ...	26s a 50s
	Slightly stony and foul ...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 37s 6d
MYRRH, picked ,,	Fair to fine pale ...	£5 a £7 10s
Aden sorts	Middling to good ...	62s a 80s
OLIBANUM, drop per cwt.	Fair to fine white ...	30s a 51s
,,	Reddish to middling ...	22s 6d a 27s
pickings...	Middling to good pale ...	12s a 19s
siftings ...	Slightly foul to fine ...	10s a 13s
INDIARUBBER Mozambique, }	red hard ...	1s 10d a 2s 2d
per lb. Ball & Sausage }	white softish ...	1s 3d a 1s 8d
	unripe root ...	1s a 1s 3d
	liver ...	1s 2d a 1s 10d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb	Nearly water white ...	4⅞d a 5d
2nds ,, ...	Fair and good pale ...	3¾d a 4d
3rds ,, ...	Brown and brownish ...	3¼d a 3¾d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 4d
	Common foul and mixed	9d a 1s 8d
Rangoon ...	Fair to good clean ...	1s 10d a 2s 4d
Madagascar	Good to fine pinky & white	2s 2d a 2s 6d
	Fair to good black ...	1s 8d a 2s 10d
SAFFLOWER ...	Good to fine pinky ...	50s a 60s
	Middling to fair ...	40s a 45s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	9s 8d a 10s 10d
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	20s a 22s 6d
,, ...	Common & middling soft	12s a 19s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb	Middling to fine ...	2d a 3d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ₩ cwt.	Good, pure, & dry white }	157s 6d a 160
Japan ...	,, ,, pink }	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	35s
	Pressed	Nominal 30s
Block [per lb.	Good ...	22s 3d
GUTTA PERCHA, genuine	Fine clean Banj & Maca-[sar	3s 6d a 5s
Sumatra...	Barky to fair	2s a 3s 9d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	2s a 3s
	Inferior and barky ...	1s 4d a 2s
NUTMEGS, large, per lb...	64's a 80's, garbled ...	2s 9d a 3s 1d
Medium ...	83's a 95's ...	2s 1d a 2s 9d
Small ...	100's a 160's ...	1s 5½d a 2s 6d
MACE, per lb. ..	Pale reddish to fine pale	2s 6d a 2s 11d
	Ordinary to fair ...	2s 2d a 2s 4d
	Chips and dark ...	1s 11d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 3d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	1s a 1s 1d
	Dark, rough & middling...	6d a 9d
SAGO, Pearl, large, ₩ cwt.	Fair to fine ...	13s a 14s
medium ...	,, ,, ,, ...	11s 6d a 12s 6d
small ...	,, ,, ,, ...	9s 6d a 11s
Flour [per lb.	Good pinky to white ...	9s a 9s 6d
TAPIOCA, Penang Flake	Fair to fine ...	1⅝d a 2½d
Singapore ...	,, ,, ...	1-11-16d a 2d
Flour ...	,, ,, ...	9s a 15s
Pearl ...	Bullet, per cwt. ...	18s
	Medium ,, ...	15s 3d a 17s 6d
	Seed ,, ...	16s

// THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for January :—

TECHNICAL INSTRUCTION.

In an able article in the *Westminster Review* of July last by Professor Andrew Gray, an attempt is made to state what technical education really means "First, then," says Prof. Gray, "technical education is education principally in the theory and the application of the scientific principles which underlie ordinary industrial operations, from the general economic laws which regulate commerce and trade, to the theory of the tools and processes of the craftsmen.....It is the assimilation of a carefully-reasoned out and coherent scheme of instruction in the general elementary principles of mathematics mechanics, chemistry, economic and natural science, with their applications, including also modern languages, literature and history, a scheme which will make the workman a thinker, a self-directing intelligence, instead of a dull lifeless machine. The notion is much too prevalent that such education being useful is, therefore, necessarily a lower kind of education than that contained in the traditional curricula of our public schools and universities. It is also too much the habit of mind of those who have been trained, or more frequently those who, having spent some little (time) in the Academic groves, and heaving breathed the same air with scholars and philsophers, only *fancy* they have been trained, in the old Humanities, to regard all instructions in the great departments of human knowledge which modern civilization and scientific discovery have called into existence with contempt, or at any rate, as unworthy the attention of a man of 'culture.'"

These words come with great force from a writer of Prof. Gray's experience, and should go far towards the end for which the article, from which we quote, was written, namely to dispel a considerable amount of misapprehension as to the meaning and scope of technical education. Even in the case of agricultural education in Ceylon there has been this feeling of contempt referred to above, and ridicule, as stated by the speakers at the recent prize distribution held at the School of Agriculture; and a good deal of gratuitous but unwelcome advice is continually being thrown out, while some are ever ready to decry and censure every effort made in this direction. One critic has gone the length of saying that the funds available to the School of Agriculture have been misappropriated! The founder of the School of Agriculture was evidently not one of those who, according to Prof. Gray, misapprehended the meaning and scope of technical education in agriculture, when he formulated his scheme of education for agricultural students in Ceylon, so as to make them "thinking, self-directing intelligences." It is a trite saying that the prosperity of a country depends upon the state of its agriculture, but it is none the less true, and was well illustrated in the history of our own Island. And it is for the education of the natives of this country in agriculture that some would grudge a modest expenditure on the part of the Government; this too at a time when the necessity for such education is being recognized in every part, even the remotest, of the globe.

But it is an encouraging thought that the rulers and leaders of the people are among the patrons of technical education; and with such words as the agricultural students heard from the speakers at the School of Agriculture last month,

impressed on their minds, they should not mind the attempts of a few ill-willed critics who delight in obstructive work, to discourage them.

The School of Agriculture has for one thing, as stated by the new Director of Public Instruction, fostered an intelligent pride in good honest work and a sense of its dignity, and its *alumni* are setting an admirable example to the students of the coming Technical Institute, the expected benefits of which are thus well summed up:—"The systematising of the instruction and training of our craftsmen, extending already existing industries, creating new ones, assisting the development and bringing about a more economic utilization of the resources of our country."

OCCASIONAL NOTES.

His Excellency Sir Arthur Havelock, who since his arrival has been going through most of the public institutions in Colombo, paid what may be said to be a surprise visit to the School of Agriculture on Monday the November. He was accompanied by Mr. Gerald Browne, P.S. and Mr. H. W. Green, late Director of Public Instruction —Mr. Cull, the present Director, being absent on inpection duty in the Southern Province. His Excellency spent a good while in looking over the chemical laboratory, inspecting the newly-started dairy, and walking over the grounds, part of which was occupied at the time with paddy, Indian corn, sugarcane, arrowroot, turmeric, three or four varieties of cultivated grasses, native yams, beans and other vegetables. Some ploughing was also done with the improved "Cingalee" plough before His Excellency by one of the students. Before leaving Sir Arthur expressed himself "much interested in this useful institution."

On Tuesday morning, the 11th November, Mr. S. Davies, travelling agent to an American firm of implement makers, accompanied by Mr. W. H. Davies of Colombo, visited the school with the object of demonstrating the use of some new agricultural implements. A trial was first made of two hand implements known as the "Planet Jr.," double-wheel and single-wheel hoes. These were so constructed as to be furnished with various attachments for ploughing, moulding, drilling, harrowing, cultivating, raking and skimming. These little machines are as perfect implements as could be wished for, and did their work most admirably. The "Planet Jr." double-wheel hoe, which is furnished with two wheels, and weighs 40 lbs. is priced at £3-3 sterling, while the "Planet Jr." single-wheel hoe, furnished with a single wheel and weighing 26 lb costs £1-11-6 sterling. They are well adapted for all crops sown in rows, and would save an infinite amount of time and labour in the cultivation of such crops as Indian corn, arrowroot, sugar-cane, as well as in vegetable garden cultivation. A trial was also made with a horse hoe (attached to two buffaloes) which could also be fitted for ploughing, cultivating, &c. This implement weighs 65 lb and cost £2-15 sterling, and is, we learn, being much used in tobacco and sugarcane cultivation. Mr. Davies had just returned from India, where he introduced the new implements, which he assured us were having a very rapid sale.

Mr. A. E. Coltton claims to have discovered in the *Lathyrus Silvestris* "the fodder plant which successfully resists not only the most severe droughts, but also frosts, and deriving its moisture, carbonic acid and ammonia from the air, and air alone, grows luxuriantly, perennially producing enormous quantities of the finest possible fodder; the plant which in course of years will cover throughout the world the vast areas of arid, uncultivated, and at present mostly uncultivated land, supplying abundance of the most nutritious fodder to countless millions of horses, cattle, and sheep; the plant which will promote the permanent prosperity and progress of stock-farming and agriculture to a certain degree unknown before; the plant which will in due course form the greatest source of national wealth to every land."

In the *North British Agriculturist* of November 19th, Sir John Lawes, "the Isaac Newton of Agricultural Science," contributes an article on Nitrate of Soda. Dr. Lawes dissents from the view which many Chemists are inclined to take that the nitrogen of the root-crops is obtained by the plants from the atmosphere. His own experiments point to a very different conclusion, and he maintains that where root-crops can do without nitrogen if only supplied with phosphates, the soils are in a high state of fertility and contain a sufficient amount of nitric acid for the use of the crop. The result of a very long series of experiments account for two facts: One is, that a given weight of nitrate of soda yields a much larger increase of roots than the same weight of nitrogen in sulphate of ammonia; the other is, that whereas it is necessary to apply potash in addition to phosphates when we use salts of ammonia, there is no such necessity when we apply nitrate of soda. Dr. Lawes finds it difficult to explain why the nitrate is independent of any addition of potash, as soda is not found in the ripe seed, however abundant it may be in the growing plant, and it is therefore tolerably evident that it cannot take the place of potash in some of its more important functions. Even in the potato there is no soda. Although nitrate has a marked influence upon pastures, cereals, and roots, its action is most uncertain upon leguminous crops; it should not, therefore, be employed for them. Dr. Lawes unmanured four course rotation, commenced in 1848 showed that the Swedes which gave the largest crop the first year gradually diminished in yield, till now though these are good plants they form no bulbs at all. The unmanured wheat and barley, on the contrary, have all through this period produced fairly good crops, averaging 30 bushels of barley and 28 of wheat, and consequently taking up large quantities of phosphates from the soil. The necessity for supplying phosphate of lime to turnips, concludes Dr. Lawes, is not because the soil does not contain it, but because the plant cannot take it from the soil. Soils manured with nitrate of soda should be kept specially free from weeds owing to the great avidity which they have for this manure. Of course as the weeds decay, the nitrogen in the form of nitric acid is

returned to the soil, but this takes time, and so far as the crop for which the nitrogen is intended is concerned the effect of the manure is lost.

At last there is a fair prospect of a Technical Institute for Ceylon. The following paragraph is from the report of the Sub-Committee of Council on the Supply Bill for 1891:—"The Sub-Committee strongly approve of the recommendation which has been made by the Government for the establishing of a Technical Institute in Colombo, and for the appointment of a Superintendent therefor. The services of a competent officer may, it is hoped, be secured for R5,000 per annum, and the Sub-Committee readily agree to the addition of provision therefor." This should delight the hearts of Mr. H. W. Green and the Hon'bles W. W. Mitchell and J. J. Grinlinton, who have long advocated the claims of Ceylon for such an establishment.

In the 36th annual report of the Ceylon Planters' Association, we read with reference to cotton, that "both by Europeans and by Natives it is being tried more or less experimentally in various parts of the Island, and in some cases with considerable success. Valuable addition has been made to the literature of the subject, notably by the prize essays published in the *Ceylon Independent.* The cultivation is simple and inexpensive, while under favourable circumstances the yields are quick and very considerable. Insect pests and a wet climate are the two difficulties which will probably prevent any large cultivation throughout the planting districts. But it seems probable that in the drier parts of the country the enterprise will be profitable to the native in his cheua and to European companies in large plantations.

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Melastomaceae.

36. *Melastoma Malabathricum*, L. Sin. Bowitya, Katakaluwa.

This is a shrub which grows wild in the hotter parts of Ceylon, and especially abundant near streams and marshy grounds. The shrub grows to the height of from 5 to 8 feet; the stems being thin and covered with an ashy yellowish bark having a coarse surface. The stems are branched into small twigs which bear the leaves and flowers. The leaves which are green, have three prominent ribs, entire margins, and are of an eliptical shape; the surfaces of the leaves being hairy. Clusters of regular flowers, having a purple corolla, are borne on the twigs, and these give place to a fruit covered with a coarse leathery covering which bursts when ripe and exposes a bluish-coloured pulp divided into five or more carpels and containing very small seed.

This pulp is eaten by children, and it stains the mouth a blackish colour, hence the Sinhalese name Katakaluwa, and the generic name *Melastoma.* The pulp is of a sweetish, very slightly aromatic taste, by no means unpleasant. In some districts the plant is found to such a large extent, and the fruits borne in such large quantities, that the latter may with advantage be used in making preserves and jams.

37. *Memecylon Capitellatum*, L. Sin. Welikaha.

This is a low shrub which grows wild in the lowcountry of Ceylon. In some rare instances the plants grow up with a single stem to about six to eight feet. The stem, though thin, is very hard and flexible; the leaves are dark green and are of an ovate shape, with an acute apex and entire margin. The whole leaf has a shiny appearance. The flowers are borne in clusters on the stem and are of a violet colour. The fruits are round and small, and borne in clusters containing from fifty to hundred crowded together. These when young are of a pale green colour, but when ripe become jet black, and when crushed show a blue colour. The black pulp surrounding the seed is eaten. This pulp is of a sweetish taste, and stains the mouth blue. Like the last-described fruit this may also be used in making preserves.

The leaves and chips of roots and stem of this plants are used in dyeing.

Cucurbitaceae.

38. *Luffa Aegyptiaca*, Mill. Sin. Nyanwetakolu.

This is a perennial creeper which grows even in high elevations in Ceylon. Sometimes it creeps to great lengths. The leaves are palmatifid and are covered with soft hairs. The flowers are monoecious. The fruits are cylindrical in shape and attain a length of from 9 to 12 inches; in an unripe state they are cut into small pieces and made into curries. When ripe the fibro-vascular bundles are developed and the fruits become hard and leathery.

39. *Luffa Acutangula*, Rox. Sin. Darawetakolu.

This is a cultivated vegetable which is generally found in villages, but it also grows wild in some places. It is a creeping plant with a thin green-coloured stem and dark-green palmatifid leaves. The flowers are monoecious. The fruits are from 9 to 12 inches in length, narrow at the base, but gradually increasing in diameter towards the extremity. The fruit is covered with a thickly-veined epicarp, which in a young state is very soft, and sharp angular ridges are formed on the surface of the fruit. In a young state the fruit is esteemed a good vegetable, and is hence grown to a large extent in the native vegetable gardens. In the markets these fruits fetch from half-a-cent to a cent each. A creeper produces many fruits and continues to bear for nearly two years.

40. *Momordica Charantia*, L. Sin. Kariwila.

This is a creeping plant with a very thin wiry pentagonal stem, having a large quantity of branches and leaves. The *M. Charantia* is largely cultivated in native vegetable gardens, but it also grows wild. The leaves are dark-green and palmatifid, and the flowers monoecious. The fruit differs in size in different varieties, is succulent, and has protuberances on the outer surface. In shape it is long and angular.

In an unripe state the fruits are of a green colour which turns to yellowish-red when they are ripe. The seeds of the ripe fruits are covered

with a scarlet pulp, are flat, and peculiarly shaped. The testa of the seed is marked as if it had been engraved. The fruits which are much used as a vegetable are esteemed on account of their reputed medicinal properties. They have a bitter taste. The degree of this bitterness seems to vary with the surrounding conditions under which the plants are grown. The curries and different preparations made from this fruit, though relished by many, are unpleasant to some owing to the bitter taste. The leaves of this plant are said to be a good vermifuge and are used with other substances in cutaneous affections.

41. *Momordica Dioicæ,* Rox. Sin. Toombakariwila.

This is a perennial creeper, with a thin much-branched stem, growing wild in the warmer parts of the Island. It is never, or very rarely cultivated. The leaves are similarly shaped to the *M. Charantia* above described, but are smaller in size and lighter in colour. This plant is dioecious. The fruits are small, rounded in form and have a succulent pericarp, of a light green colour, covered with small protuberances which give the fruit a characteristic appearance. It forms a good edible vegetable, having none of the unpleasant characters of the preceding species. It is also considered to have many medicinal properties, and is always recommended to invalids.

A yam is found at the root of this plant which is used by Native Medical Practitioners in the preparation of different medicines, and especially those used for snake bites.

THE LAWS OF CEYLON RELATING TO AGRICULTURE

(Ord. No. 21 of 1867 amended by 2 of 1873 and 2 of 1887.)

II. *To Promote the Maintenance and Extension of Paddy Cultivation in this Island.*

"Proprietor" means, except when otherwise provided, the proprietor of paddy lands only, and includes the cultivator or person in actual possession of any such land.

"District" means any Corle, Pattu, Village or other subdivision of a province as the Government Agent thereof may deem convenient.

I. *Meetings to form Irrigation Districts.*

1. The Government Agent of any province may, whenever he thinks it advisable or upon a requisition signed by not less than ten proprietors call a public meeting to form an irrigation district for the encouragement and extension of paddy cultivation.

2. In case the extent of the District should render more meetings than one necessary, the Government Agent may form several divisions of each district and hold a meeting at each division.

II. The Government Agent to give notice of such meeting, at least one month before the day fixed for the meeting, stating its object and calling on proprietors to attend in person or by proxy in writing.

III. Meetings to be held at the time and place appointed, in the presence of the Government Agent. Every proprietor present, either in person or by proxy in writing, is entitled to declare to the Government Agent,

(1.) Whether he wishes that the district should be constituted an irrigation district within the meaning of this Ordinance.

(2.) Whether he wishes that the Ordinance should for that end be carried into operation with the aid of headmen or of Village Councils, or of both.

(*b.*) After explanation by the Government Agent of the results that would follow, according to this Ordinance, from the different modes of carrying the Ordinance into operation, if the proprietors determine to adopt the aid of the Village Councils, it shall be lawful for them to appoint a Committee of not more than twelve nor less than three persons to be associated with the Government Agent for the purpose of drawing up rules for the enforcement of ancient customs or for advising him in matters connected with the irrigation of the district.

(*c.*) Where more meetings than one are held for any district, each division to be allowed to appoint its proportion of the Committee to make up the number of the entire district.

(*d.*) Minutes of meetings to be signed by the Government Agent and to be deposited in the Kachcheri, and certified copies thereof to be transmitted to Government.

IV. Objections to votes to be decided by the Government Agent; such objections and the decisions thereon to be recorded in the minutes.

V. Majority (of two-thirds at least) to determine all resolutions proposed at meetings.

VI. Districts and rules under No. 9 of 1856 and No. 21 of 1861 to continue. Proprietors to have power to change their determination in respect of the questions referred in the 3rd section both as respects the districts constituted under the above Ordinances as well as under the present. Such fresh determination to be binding until altered again.

VII. Where proprietors cannot be convened, the Government Agent to draw up rules for the enforcement of ancient customs, and to carry this Ordinance into operation with the aid of headmen.

VIII. Acts done in contravention of the said customs or rules to be investigated by the headmen or by the Village Council according to the election made by the district under the 3rd section of this Ordinance.

II. *Headmen.*

1. One or more headmen shall be appointed, if the result of the meeting under section 3rd of this Ordinance be in favour of such a course, to attend to all matters connected with the irrigation of the district, and to prevent the infraction of rules in reference thereto.

II. (1.) Headmen shall be appointed by a majority of proprietors present either in person or by proxy.

(2.) Government Agent to have power to dismiss any headman guilty of misconduct.

(3.) Vacant offices to be filled up by headmen elected by majority of proprietors.

(4.) Till such election takes places, the Government Agent may appoint provisionally.

III. 1. Headmen may take prompt action, where such action is necessary, to prevent damage accruing to any proprietor by any act committed in breach of the rules and report it to the Government Agent.

2. If possible, before taking such action, the Government Agent must be communicated with, and his instructions awaited.

IV. Expenditure incurred by any headmen in consequence of the act of any party must be paid by such party on the production of a certificate by such headman from the Government Agent; in case of non-payment within 10 days from the service of the certificate, the Government Agent shall proceed to recover it as provided in the 6th division of this Ordinance.

V. Headmen to be paid for their services: proprietors refusing to pay to be proceeded against as provided in the 6th division of this Ordinance.

III. *Rules for Enforcing Customs.*

I. Rules for the enforcement of ancient customs to be framed by the Committee appointed under the 3rd class associated with the Government Agent. The rules framed to be transmitted to the Governor for the approval or disallowance thereof by him and the Executive Council. After approval they are to be published in the *Government Gazette*, and in the district in such manner as the Government Agent shall seem expedient. After such publication they are binding on all proprietors of land, provided they be not repugnant to or inconsistent with the true intent and meaning of this Ordinance.

II. Rules may be amended or repealed in the same manner as the original rules were framed.

IV. *Village Councils.*

I. (1.) Village Council may be convened by the Government Agent.

(2.) Notice of it to be given in the village where the party complained against resides, or where the act complained of was committed.

(3.) The Government Agent or some person deputed by him to enquire into the complaint with the assistance of a Village Council.

(4.) If the party complained against be adjudged guilty by the Village Tribunal, and if the verdict be concurred in by the Government Agent, he shall be fined any sum not exceeding £3.

(5.) The enquiry to take place in the presence of the accused party, except in case of wilful absence after receiving notice.

(6.) Sentence not to be executed unless confirmed by the Government Agent. Proceedings of inquiry presided over by a Deputy to be forthwith submitted to the Government Agent for confirmation.

II. 1. Village Council to consist of not less than five nor more than thirteen men selected by the President of such Council from among the proprietors of paddy lands in the district.

2. Government Agent or some person deputed by him shall be President. President shall conduct and keep a record of the proceedings and shall have a casting vote.

III. Proceedings to be summary and free from any formalities.

IV. Proceedings of Village Council not subject to appeal or injunction.

V. Penalty for breach of rules to be recovered in the manner indicated in the 6th division.

VI. Village Council may direct appropriation of penalties for the payment of damages incurred by the aggrieved party.

VII. Penalties to be paid to the Agent, and by him applied as directed by the Village Council, and the balance to be expended in carrying out this Ordinance into execution, and for such other purposes of irrigation works within the district as the Government Agent and the Committee appointed under the 3rd section shall determine.

V. *Construction, Repair and Improvement of Irrigatiom Works.*

I. (1.) When it is necessary to construct repair or improve any work connected with the cultivation of paddy lands, the Government Agent to call a meeting at his own instance, or on the application of three or more of the proprietors, of those likely to be benefited by such work, and to determine by a majority of their votes whether it is desirable that such work should be constructed, repaired or improved, and whether Government aid is necessary for such work.

(2.) Where Government aid is not necessary, a majority of the proprietors shall determine the rate of subscription in money or contribution in labour payable by each proprietor towards the work.

II. (*a.*) Where Government aid is necessary, the Government Agent to make application for such aid specifying

(1.) The allotments likely to be benefited by such work.

(2.) The names of the proprietors of such allotments.

(*b.*) The Governor, if he think it expedient, may order plans and estimates of the work to be prepared and refer the same to a Board consisting of the Government Agent of the province (and not any Assistant Government Agent), the Surveyor-General, and the D. P. W. for report on the advisability of the undertaking.

(*c.*) After receipt of report the Governor may sanction the performance of the work, and such sanction to be published in the village by beat of tom-tom.

(*d.*) After such publication the allotments of land (as set out in the specification of the Board as aforesaid, and which said specification shall be conclusive on the point) and the proprietors thereof are bound to repay the cost of the outlay as provided hereinafter.

(*e.*) Such cost to form a first charge on the several allotments and to take precedence over all mortgage, hypothecations and encumbrances whatsoever.

III. Government officers shall execute the work, option being left to the proprietors to execute the earthworks.

IV. (*a.*) The sum expended by Government in the execution of the work shall be payable in ten yearly instalments.

(*b.*) The Government Agent to assess the amount due from each allotment of land including the allotments belonging to the Crown.

(*c.*) The Government Agent shall thereupon issue a requisition to each proprietor calling upon him to pay the amount due from him on specified days in each year.

(*d.*) If any proprietor be absent from the village, or if from any cause the requisition cannot be served on him, the Government Agent shall order it to be affixed in some conspicuous place in the allotment, and the Government Agent shall further cause a notice to be published in the

village, by beat of tom-tom on three different occasions, specifying the allotments which will have to contribute towards the cost of the work, the sum each allotment is assessed at, and the time within which the different instalments are to be paid.

V. Lands required for irrigation purposes shall be acquired according to any laws now or hereafter to be in force for the acquisition of land for public purposes; the sum paid as compensation for such land shall be included in the cost of the work to be recovered as hereinafter provided.

VI. Plan or survey of channels made under the authority of the Surveyor-General shall be deemed conclusive proof of the facts exhibited therein, unless satisfactory proof to the contrary be established.

VII. The Government Agent may order verbally or in writing any person obstructing or encroaching to remove or abate such obstructions or encroachments upon channels, ponds, tanks, etc.; or non-compliance with such order the Government Agent may cause such obstructions and encroachments to be removed or abated; and for this purpose the Government Agent or any person thereto authorized by the Government Agent may enter into any garden, enclosure or other premises, and to do such things as may be necessary. The costs incurred in effecting such removal or abatements shall be recovered from the party on account of whose non-compliance with the order the costs were incurred.

VI. *Recovery of Money under this Ordinance.*

I. If default be made in the payment of any instalment due in repayment of the amount expended by the Government on the construction, repair or improvement of any irrigation work, the Government Agent or any person authorized by him in writing may seize the allotment of land herein declared bound and specially chargeable with the repayment due by it of the amount expended by the Government. If any person refuse or neglect to pay any other sum which he is made liable to pay under this Ordinance, any property belonging to him and situate within the province or district may be seized. If the amount due together with the costs and charges payable under section 3rd of this division shall not be previously paid, the Government Agent shall proceed to sell the allotment of land or property so seized, by public auction, at any time not less than 2 days from the time of such seizure.

II. Person making the seizure may place and keep a person in possession of the land so seized pending the sale.

III. The Government Agent may demand from the person by whom money is due aforesaid, or from the owner or joint owner of any property seized the several sums of money mentioned as follows:—

(1.) For cost of proceeding to the land of the person in default in order to seize the same, a charge not exceeding one shilling for every pound due.

(2.) For keeping a person in possession a charge not exceeding one shilling a day.

(3.) For the expenses of sale a charge not exceeding 6d. in the £ on the net produce of the sale.

IV. Overplus, remaining after the deduction of the above charges, to be restored to the owner or joint owners of the property sold.

V. (1.) Certificate of sale granted by the Government Agent to be sufficient to vest absolute right and title to and interest in the land sold in the purchases free from all encumbrances, whatsoever any law or custom to the contrary notwithstanding.

(2.) Such certificate shall be liable to the stamp duty fixed on conveyances of immovable property and to any registration or other charges authorized by law, such duty and charges being payable by the purchaser.

Miscellaneous.

1. Customs certified to by Government Agent to be *prima facie* evidence of their existence.

2. Powers given to Government Agent may be executed by any Assistant Agent.

H. A. J.

(To be continued.)

THE SUNFLOWER PLANT.

(Helianthus Annus.)

By W. A. De Silva.

The sunflower is a perennial, slightly woody plant, growing to the height of from three to four feet. It belongs to the composite family. The flower heads which are very gay in appearance mostly are borne on the top of the plant, though a few are also borne on the small twigs given out from the leaf axils.

The cultivation of the sunflower as an ornamental flowering plant is common in the temperate and tropical climes, but it is also being largely cultivated as an agricultural product in parts of Russia, Turkey and other countries.

The sunflower, as its name in many languages signify, is associated in the minds of many a people, more or less with the sun. There is a popular belief that this flower is attracted by the sun in such a way, that it turns round from east to west, facing the course followed by it. But careful observations have proved that this idea is a fallacy, and the power of the sun is not greater on the Helianthus than on any other plant.

The uses to which this plant is put to at the present day are many. Among these the chief one is the oil which is produced. The seeds contain a large percentage of a fine oil, as good as the best sweet oil. This oil is used for culinary as well as lubricating purposes.

The seeds which have a milky taste are also valued as a good food for poultry and birds, and is esteemed much for their fattening properties. It is said that it is a desirable food for man too.

A fine yellow dye is prepared from the large golden petals of the flowers. This dye may with advantage be used in colouring silks and other light materials.

The leaves are also of some use, and a kind of cigarette is manufactured from them, which is used to a large extent, as it is reputed to have some medicinal properties.

The whole plant is considered to be a febrifuge of great value. A decoction made from the leaves and stems of this plant is said to be very

efficacious in cases of malarial fever. It is said that this plant surpasses even quinine in this respect.

The cultivation of the sunflower for the purpose of obtaining oil has been attempted in Ceylon, but not with much success. The plant grows well in many parts of the Island, and it is worth while making further experiments not only for the sake of the oil, but for utlising its other products more fully. If such experiments are attended with success, the plant ought to prove a paying garden crop.

It is said that this plant serves as good fuel, and that it has been used for heating stoves. Perhaps this new use might induce some to make further trial whether it could be cultivated with profit.

NOTES FROM A TRAVELLER'S DIARY.

Andiyagala was the place I mentioned last in my notes. About 5 miles' journey, from this place, brought me within sight of the Kalá-Balalu Wewa, which presented an appearance which I did expect. The tank was almost dry, the sluices having been opened to irrigate the fields below. A great part of the thick forest which once covered the bed of the tank is still there, devoid of its green foliage. The fallen leaves and the felled trees were lying beneath the shallow water emitting an odour peculiar to the decomposition of vegetable matter. The following inscription appears on a granite slab at the main or the Yóda-Ela sluice:—"This sluice, originally constructed in the reign and by order of King Dhatu Sen, about A. D. 460, was, after many centuries of neglect, rebuilt in the reign of Her Majesty Queen Victoria A. D. 1886."

The very existence of the town of Anuradhapura seems to depend on this tank, without which most of the other tanks in the vicinity will be dry, and paddy cultivation, in consequence, will have to be abandoned. It seems a pity that a permanent supply of water cannot at present be maintained in this tank. The natives in the vicinity have a peculiar aversion to drinking well water. They say the tank water tastes better. There seems to be some truth in this, for I found that in most cases the well water had a brackish taste.

The town of Anuradhapura, which was, at one time, one of the most thickly-populated cities in the East, looks now more like an ill-kept Park than anything else. The place is interesting botanically as well as archæologically. Interesting water plants and ferns and trees of various descriptions could be seen here. The oldest historical tree in the world is also here, but it now seems much degenerated. The town has a small Botanical Garden. Several varieties of cotton have been tried, and the Egyptian variety seems to thrive well.

The paddy-fields at Anuradhapura are quite a sight worth seeing when under crop. Some of them were the best that I ever saw. Extraordinarily high yields has always been the result of judicious cultivation; coconuts and plantain also seem to thrive well here.

Most of the tanks in the interior villages were almost dry, and at a place called Mahadiwul-wewa, near Madawadchiya, I saw a splendid crop of paddy in a dried portion of the tank. This sort of cultivation is called in Sinhalese 'Káwala Wepiréma.' The yield is very high owing to the exceptional fertility of the soil; but the superstitious belief of the people is that the "demon" has an aversion to eating this paddy and he therefore does not steal it!

BUILDING MATERIALS.

SECTION I. STONE *(continued).*

BY A FACTORY APPRENTICE.

Decay and Destruction of Stone.—The great agent of destruction to building stones is the damp or the water supplied by the atmosphere directly or indirectly. The precautions to be observed are very simple. "The first and foremost rule is never to employ a porous absorbent stone in the ground, or in elveation; unless in the former case it be maintained constantly wet; or in the second case, the absorption of moisture from the ground be prevented by the interposition of some impermeable material. Porous stones should never be used for parts of a building where water may lodge." Various other causes give rise to the decay and destruction, such as:—1st. Oxide of iron if allowed to remain in any notable quantities. 2nd. The crystalline sulphate of lime in consequence of the sulphuric acid they contain. 3rd. The silicates and the sulphates of iron so often met with in building stones. Decay and destruction of stone is also caused by nitrification which takes places near damp ground.

"Not only does this nitrification throw off the minute and less adherent particles of the building materials, whether they be of stone or brick, but it is also able to detach any protecting coat which may be put upon them if the adhesion of that coat to the subacent material should not be of a very energetic nature. Let the adhesion be ever so energetic, if once the action of nitrification should have been established, it must run its course, and the amount of evil it is capable of producing will simply depend upon the quantity of organic matter originally contained in the materials or susceptible of being absorbed by them from the atmosphere."

Preservation of Stone.—It is always advisable to guard against any sort of decay setting in to a building stone, since to arrest its progress after it has been once allowed to establish itself is impossible.

The following are some of the precautions observed to prevent stone decay:—1. By painting. 2. By the injection of oleaginous fatty or waxy matter. 3. By washing the face with a solution able to convert the material into an insoluble non-absorbent substance. 4. By filling in the pores of the stones with an insoluble material which should effectually exclude water.

There are strong objections raised against the process of painting, as the oil evaporates and the stone become again exposed to the atmosphere, and so the process has to be renewed.

The second process, namely, by the injection of oleaginous, fatty or waxy matter can only act

mechanically by closing the pores of the stone This coating like painting itself has to be renewed, since it is gradually detached from the stone.

The third process, that of washing the face with a solution able to convert the material into an insoluble non-absorbent substance, is one "in which the carbonates of lime are washed with a solution of an alkaline silicate, as silicate of soda or potassæ with a view to converting them into silicates of lime through the elective affinities of the lime and the silica. One objection to it is that the silicic acid is a slow one, and when the surfaces washed in the manner described are exposed to the rain, it is by no means rare to find the solution carried away."

The fourth process is to clear the stone from dust or other extraneous matter and make it absorb as large a quantity as possible of the silicate of soda or potassæ. When the solution has dried into the stone a second wash should be applied consisting of the chloride of calcium.

(To be continued.)

PRIZE DAY AT THE SCHOOL OF AGRICULTURE.

Yesterday (Nov. 29th) afternoon took place another of those pleasant gatherings which recur annually at the School of Agriculture in the Cinnamon Gardens. The entrance to the building was tastefully decorated, and the school-room had much artistic labour bestowed on its decorations. The Hon. the Colonial Secretary presided, and amongst others present were the Hon. J. J. Grinlinton, Hon. W. W. Mitchell, Hon. Dr. Anthonisz, Hon. M. C. Abdul Rahiman, Messrs. H. W. Green, J. B. Cull, T. E. De Sampayo, Mrs. and the Misses Keith, Mr. James De Saram, Dr. H. M. Fernando, the Maha Mudaliyar, Mr. C. Drieberg, Mr. and Mrs. Joseph, Messrs. C. Thomasz, Walter Pereira, R. P. Jayawardana, Mrs. and the Misses Beven, Mr. and Mrs. Schrader, Mr. C. M. Fernando, Mr. and Mrs. Jeronis Peiris, Advocate Senathi Rajah, Miss Frédoux, Mr. Ranesinghe, Mr. J. S. Drieberg, Mrs. and the Misses Attygalle, Miss Lindsay, Miss Drieberg, Mrs. and the Misses Grenier, Mrs. C. Drieberg, Rev. S. Lindsay, Mrs. A. de Saram, Dr. and Mrs. Asreappa, Mr and Mrs. F. Dornhorst, Rev. T. C. Hillard, Dr. Bowles Daly, &c.

The proceedings commenced by the President calling upon the principal (Mr. C. Drieberg, B.A.) to read his Report.

Report was of a very encouraging nature, and its reading was punctuated with frequent marks of applause from the audience. It alluded in terms of praise to the late Governor Sir Arthur Gordon, who had by his encouragement and patronage in previous years shown his interest in the work of the School. His Excellency Sir Arthur Havelock was prevented from presiding owing to pressure of work, but he had already shown his appreciation of the work carried on in the School by visiting it. The presence of Sir Edward Walker was an indication of the interest he evinced on behalf of the school. The report next proceeded to state the results of the operations carried on in the various provinces by the students who had been sent forth from the School. One of their men had been appointed as an agricultural instructor in the fever-stricken district of Walapane—the condition of which district the energetic Assistant Government Agent of Nuwara Eliya was endeavouring to ameliorate. That appointment made up a total of twelve students who had been employed as agricultural instructors—seven of whom were paid by Government and five privately. It was a matter for congratulation that the Government officials rendered valuable assistance to the cause of agriculture, notably the Government Agent of the Eastern Province, the Government Agent of the Sabaragamuwa Province, and the Assistant Government Agents of Matara and Kegalla. Another batch of students was leaving College on completion of their studies to engage in agricultural pursuits. It included some excellent young men, among whom was Mr. J. J. Koddipilly, who has had a brilliant career at the School. One feature of interest was the publication of a Monthly Magazine devoted to the interests of Agriculture; and this literary effort is appreciated by those for whom it was intended. The School Museum is growing in size, the Agricultural Discussion Society is well supported by both students and outsiders. A dairy has also been set on foot by the headmaster, Mr. Jayawardana, and experiments have so far been attended with success, and it is satisfactory to note that a long felt want has been supplied. Through the knowledge imparted in this branch of agriculture the students could gain a knowledge of the proper housing, feeding, and general treatment of cattle in health and disease. Another feature of interest in the report was the fact that a large variety of crops had been grown on the School grounds with the view of demonstrating the most approved methods. The report next referred to the willing help and ready assistance of Mr. De Silva, the second assistant, not only by teaching in the School but by his writings. Another student of last year's batch has been employed as a conductor on an upcountry estate; and it was satisfactory for the Principal to note that the advantages of employing such men consisted not merely in having an intelligent manager but also a disciplined and honest employee. The report concluded by speaking of the loss of their old Director, Mr. Green, to whom the School owed its existence and success, but they had also to welcome the presence of Mr. Cull, whose established reputation as an educationalist insured the successful direction of the Department of Public Instruction.

Mr. J. B. Cull, M.A., the new Director of Public Instruction, then rose and said:—Sir Edward Walker, Mr. Principal and ladies and gentlemen,—I congratulate myself in the fact that my predecessor, Mr. Green, has come amongst us this evening prepared with a speech. The School is pre-eminently a poem of his own composition; and the fact that I am so completely new to the use of the plough makes it impossible for me to comment on the nature or the results of the School in any way as adequately as I would wish. I congratulate you, Mr. Principal, on the record you have been able to present for the year. I learn that there are 26 students

on the roll, and the report of those students who have been sent forth to work in the various districts is entirely satisfactory. (Applause.) I leave it to my predecessor to comment upon the various modes of agriculture that are carried on in the Island with unvarying success in the various provinces. As regards the School itself, I note with great pleasure that it embodies one of the most noble feelings, and, what is best, it teaches the dignity of labour. (Applause.) Passing the compound the other day I was struck by seeing the boys engaged in mamotying and other kinds of operations, and in a country like this, such kind of work is eminently satisfactory. It has been wisely remarked that a man who makes a blade of grass to grow in a place where there was no grass at all is a benefactor to the country, and this is the great object of the Agricultural School—multiplication of the fruits of the earth; making nature yield more abundantly and tending to eliminate as far as human agency can eliminate the ill-effects arsing fiom untoward climatic conditions in the island. (Applause.) Reading in connection with this subject a poem written many centuries ago, the "Georgics" of Virgil, I was struck with the rule laid down regarding ploughing, in which the author recommends that as a preparation for ploughing one should take his coat off, and put his shoulder to the plough, and it is universally true that a man who cannot take his coat off and put his backbone into his plough is a very incomplete agriculturist. (Applause.) I will not occupy your time any longer in view of the speeches which are to follow, save to express my great gratification at being present here this evening, and to express the interest I have always taken on behalf of the School of Agriculture. (Loud applause.)

Mr. H. W. Green next rose, and said that the students of the Agricultural School, unlike other ordinary educational establishments, were limited to a certain number. They had a great many applications for boys, but their number was limited to 23 in his time, and now he saw it was 26. They only wanted a select number of boys, who had the interests of agriculture at heart. He read in the newspapers that one of the boys had been sent from the School to the clerical examination, but he hoped that the Principal would never allow this to occur again, for the one object with which the boys entered the School of Agriculture was to qualify themselves in agricultural knowledge and to go forth and spread forth that knowledge. When he first thought of an Agricultural School, he had many discouragements to contend with, but he was now glad to find that he had successfully broken the ice. There were eleven agricultural instructors, seven of whom were paid by Government and five privately, so that all their old students were not simply employed under Government. The improved plough had done a great deal to foster agriculture, and from the reports to hand, he found that the crops had more than doubled their usual yield by the use of the plough. They had sent out their young men to work with the improved ploughs, and they had all done good work. The other day he sent out a hardworking man to work in a place some 19 or 20 miles from Trincomalee. The people there were not inclined to work at first, but the speaker himself spoke to the people and told them that if they did work, they could share the profits equally and so ward off starvation. At last they did set to work, and they got a good return and shared the profits. He moved the instructor on to the next station, and the result was so eminently gratifying that here were several applications for the ploughs. Their object was to disseminate a knowledge of agriculture so that others might follow the example; for he found the Sinhalese people always ready to take advantage of opportunities offered to them. They wanted the young men to work. A good many had already taken advantage of employment on estates, and he was quite sure that the education received here would not be thrown away in vain. In conclusion he wished all success to the institution and wished the pupils good-bye. (Applause.)

The distribution of awards then took place according to the following list, each recipient as he came up to receive his gift being heartily cheered by his comrades:—

Seniors.—Agriculture, Chemistry, Botany, Zoology, Entomology, English, History and Geography, Mathematics, and Practical Chemistry (the late Mr. de Soysa's prize) all gained by J. A. Kodippily; Veterinary Science was won by A. Drieberg; and Practical Agriculture by J. P. Ranasinghe.

Juniors.—Agriculture and Geology by P. V. Cooray, and Chemistry, Botany, English, History and Geography, Mathematics, and Field Surveying (the Grenier prize) all by E. M. Johannes.

THE PRESIDENT'S SPEECH.

The prize-giving over, Sir E. Walker said:—Mr. Principal and ladies and gentlemen:—It gives me great pleasure to come here today and to make the acquaintance of the School of Agriculture and to join with you by your presence in the expression of encouragement to the masters who have been engaged in teaching the boys during the past year and congratulating the boys themselves on their course of study. (Applause.) I trust that those who have received prizes today will find in them an encouragement to persevere in after life and to exercise that industry which have enabled them to attain certificates. I am not altogether a stranger to the School of Agriculture. The deservedly high terms in which Mr. Green has spoken of the institution I am well aware of, as it has been my good fortune to have been much associated with Mr. Green, and from him I have from time to time heard a great deal of the School and have been much impressed with the zeal and the interest he has taken in it. (Applause.) I think the Principal in his Report has very rightly expressed regret at his loss, but it is not a very real loss after all, for you have in his successor a gentleman who has the interests of practical education at heart, and I feel sure that he would use his best efforts in furthering the work of agriculture. (Applause.) And you have Mr. Green in a position to help you at the Governor's elbow and as my principal colleague and assistant. As regards the work of the School I have heard of several accounts disparaging and discouraging the work and utility of the education given in this institution. Of course it would be difficult by statistics to show how valuable the School was,

but I am of opinion from all the information I have gathered, that those boys who have been sent forth from this School into the various provinces of the island are doing good work in agriculture. (Applause.) I put the question to Mr. Drieberg when I came into the room whether during his travels about the country he had seen good work being carried on in agriculture as the result of the money spent on it, and he unhesitatingly answered in the affirmative, and I think we may take his opinion as one of considerable value. His opinion is, moreover, of an independent character, because he belongs to this country, and it is not as if he were speaking of the results of his own labours, but of those who have gone before him. Some people have tried to throw cold water over the school: but if the boys only worked quietly and persistently their labours would bear much fruit. (Applause.) The Principal has referred to a pupil who had gone to the district of Walapane. Well, I know of no one who is likely to do more good to that unfortunate part of the district than one who would instil into the poor people there some knowledge of agriculture, and if he did that he would certainly accomplish more than what Government officials and Colonial Secretaries had yet been able to achieve. In conclusion, I have only to express the great pleasure it has given me today in taking part in the prize-giving this year. (Loud applause.)

The Hon. Mr. J. J. Grinlinton followed, and in the course of a spirited address urged on the School the desirability of experimenting upon the system of transplanting paddy. In some parts of the country this system was a success, while in other parts it was a failure, chiefly because in many cases transplanting took place at the wrong time and the plants died. He hoped that the matter would occupy the attention of the Principal and his puplis, for transplanting was carried on on an extensive scale with various other products, and he saw no reason why they should not carry out experiments in transplanting paddy. With regard to the remarks which fell from the President and Mr. Green that cold water was being thrown on what they did by some people, he believed that these people were everywhere in the world, and the very men who had not lifted a finger to help them and had done all they could to discourage them would whenever they heard that success did attend their efforts, say "We told you so." (Laughter and applause.) He counselled the young men not to trouble themselves about the criticisms levelled against them, but simply to work on steadily and success would assuredly follow. He was sorry to find that the Sinhalese nation were not giving that attention to cultivation which they did in the ancient days. In those days their one ambition was to possess and cultivate the land, but now the majority of the young men only tried to get educated and seek employment under Government on the smallest pittance. This, the speaker said, was what ought to be discouraged; and he thought the best thing for our young men to do was to put their shoulders to the plough and to give their attention to agriculture. (Applause.) In addition to agricultural knowledge, a knowledge in mercantile matters was also indispensable. He would instance the case of those gentlemen in England who were trained to agricultural pursuits in preference to a berth under Government, and he maintained that if the young men only considered the advantages to be gained from a knowledge of agriculture, they were bound to succeed in life. In conclusion, the speaker proceeded to advocate technical training. The School was only in its infancy, and they had heard of the success which had attended their efforts; and if success had attended efforts where difficulties had to be surmounted before, he had no doubt that a school for technical education would also meet with success. (Applause.) Without technical education the School could not prosper, and he would be very glad if technical education was brought to the very doors of the natives. (Loud applause.)

Mr. H. W. Green referring to Mr. Grinlinton's remarks regarding the system of transplanting said that was the first thing he started with, as it was the system which brought out the best returns. In China and Japan this system of transplanting brought enormous folds, and even transplanting in the sandy soil at the back of the room resulted in a yield of 539-fold. Another great advantage in favour of transplanting was that 10 measures sufficed to plant out an acre of land, whereas the people usually used two or two and a half or three bushels an acre. The system too could also be carried by means of a nursery in one corner of the field, and during a period of drought the cultivator would be able to water this small piece of ground from his chatty and thereby to tide over the period of drought without being starved. (Applause).

The President said that in bringing the proceedings to a close he wished all the pupils a successful career. He might mention that in connection with the eleven students who had left the institution for the various provinces, the fact that five had been employed by private parties indicated that they had shown an independent appreciation of the worth of the School. (Applause.)

Three hearty cheers having been given to Sir E. Noel Walker for presiding on the occasion, followed by rounds of cheering for the Principal and the visitors, the gathering adjourned to the green, where light refreshments were partaken of: the Band of the C. L. I. V. treating the people to some excellent music.

GENERAL ITEMS.

Mr. H. S. Holmes Pegler, Author of "The book of the Goat," writing to the *Agricultural Gazette* on the milking properties of goats, says that two quarts a day is a fair average for a good milker. A goat which was exhibited at the Royal Aquarium Show and won the milking prize gave nearly a gallon a day. In Switzerland and Malta much attention has been given to the improvement of the milking qualities of goats. Regarding quality, Mr. Pegler says that in almost every case goats' milk is richer than of the cow; heavy milkers, however, as a rule supply a comparatively poor yield. In order to compare the comparative richness of the milk of the goat and the cow, an analysis was made of the milk from a Cashmere goat belonging to the Queen, and that of a Shorthorn cow, winner of

the Champion Cup in the milking trials at the Dairy Show of 1888. While the goats' milk was found to contain of water 80·72 per cent, fat (pure butter) 6·93, and solids other than fat (casein, sugar, and ash) 12·35; the cow's milk gave the respective percentages of 87·56, 3·63, and 8·81. The sample of goats' milk thus showed 7 per cent less water, while it contained nearly twice the quantity of pure butter fat, and half as much again of other solids. Besides its richness and nutritious property, goats' milk has the merit of being extremely digestible, and is accordingly recommended by medical men as a diet for invalids and children. In Ceylon goats are of no great importance as milk-producers among the natives, though the Hindu and Mussalman classes use the milk to some extent. The value of the milk as food for invalids and children is, however, recognised even here.

Says the Melbourne *Leader*, in an article on valuable vegetable products:—The Indian Arecanut is règularly eaten every day in the year by 100,000,000 of the population. There is an annual importation of upwards of 30,000,000 lb. from Ceylon, the Straits Settlements, Sumatra, and they are exported in considerable quantities for the use of the Indians living in Zanzibar, Aden, Mauritius, China, and other countries. The fresh nuts have intoxicating properties and produce giddiness. These objectionable properties are much diminished by heat and by drying, and many cautious people decline to use any except nuts which have undergone a process of cooking and are known by their colour. The original wild nut was intoxicating, but the only nuts now used are from cultivated trees, and these are milder. They are only intoxicating when unripe, and then but slightly. The nuts are eaten with the betel leaf, the praise of which is sung in ancient Hindu books which attribute to it no less than 13 valuable properties which are duly enumerated. Modern medical men vouch for the fact that essential oils of betel leaves are highly beneficial in catarrhal affections and throat inflammations. Further researches into the properties of the nut and leaves are evidently called for, because their preparations by native methods are a good deal regulated by superstitions. The betel leaves are mixed with other spices used with lime to form *pan*, with which the nuts are eaten. An organic poison can be extracted from the nut, and when this is injected under the skin of rabbits and cats they die a few minutes; but the same may be said of a great many vegetable productions, the Kola-nut inclusive, which are usually regarded as harmless. Even the lettuce contains such a poison. The arecanut is grown on a palm which is supposed to be indigenous in the Malayan peninsula and islands, but is not now found in a wild state. The Indians no doubt indulge too freely in the use of the arecanut and betel leaves, but for exceptional use they may be found to be medicinally beneficial. If the reverse be the case, further investigation is demanded on behalf of the 100,000,000 betel eaters. It is a popular idea among betel-chewers that the chewing mixture has digestive as well as antiseptic properties.

Mr Johansson, a Swedish Engineer, claims to have invented the simplest and most rapid machinery by which new milk can be converted into butter. The process takes less than three minutes, and the machine could deal with 1,500 pounds of milk per hour. Mr. Johansson received the highest award at the Royal Agricultural Society's Show last year.

A trial of ploughing by means of electric motors is about to be made on the property of the Marquis de la Laguna. The power of a waterwheel of some 20 H. P. will be employed, and the implement for working the land is excepted to work at a distance of 3 miles from the generating dynamo.

During the year 1889-90, says the *Madras Times*, there was a general rise in the prices of the principal food grains and horsegram throughout the Madras Presidency as compared with the two previous years.

The value of charcoal to plants is not so much as a fertilizer as an absorber of ammonia both from the atmosphere and the soil. It is further claimed for charcoal that it prevents attacks of insects and fungi.

The British Consul at Bahia has more than confirmed the wonderful stories told of the properties of the Kola nut. The Kola-eating Africans who labour at the unloading of vessels are said to work and earn twice as much as their competitors. The beans which are described as unintoxicating and in no way injurious, are said to act as a nutritive and quench thirst: yet they are not strictly a stimulant. The beans are best soon after they are gathered, and are sold according to freshness at twopence or threepence each bean. At the request of the Government of India practical information regarding the extraordinary properties of Kola-nuts has been supplied by the authorities at Kew.

Dr. Henry Baker of Michigan remonstrates vigorously against the proposal to discard the fumes of burning sulphur as a disinfecting agent. He shows by tables and diagrams the controlling power of this disinfectant, and attributes its alleged failure as such to the use of too little sulphur. The burning of 3 lb. of sulphur to the thousand feet of air space is sufficient to destroy the germs of contagious disease in a closed room, without extra moisture in the room. In support of his position he quotes the results obtained by recent French experiments in this field.

The members of the Indian Agricultural Conference were unanimous in urging that educational primers of an agricultural character should be introduced in all primary schools, and also that arrangements should be made for the supplying of a high-class education in Agricultural Science to all who desired follow it out.

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THE

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LEAD FOR LINING TEA CHESTS.

A considerable amount of discussion has of late taken place as to how far it may be possible to substitute various forms of linings for tea chests in lieu of the lead which has almost from time immemorial, been used for that purpose. The objections that may be taken to the use of lead for this purpose are many and various. Chief among these is the item of cost, and, scarcely secondary to that, the weight for which land carriage both up to the estates and down to the port of shipment has to be paid. There are those who further maintain that lead packing for any articles of an alimentary nature is to be deprecated, it being urged that, although in a degree insensible to observation, the introduction of a certain amount of lead poisoning most injurious to human system, may be due to the practice.

We may, we believe, leave this last objection out of consideration; for although we do not deny that the contact of lead with food destined for human consumption is injurious, we doubt exceedingly if it has been proved that the tea packed in lead linings has ever imbibed from it any deleterious quality. The two first objections we have mentioned are, however, of gravity fully sufficient to justify the desire felt for the provision of some efficient substitute for these lead linings, for they are—all experience teaches us—not only weighty, but sometimes costly and troublesome to prepare. On this account alone we have welcomed, and are yet prepared to welcome, any suggestion likely to be of effect in offering an efficient substitute for lead. Of late, reports reaching us as to the satisfactory results of shipments made in lead paper, as also in artificial parchment, would seem to have indicated that such a substitute had been found. But the mention made in our London Letter by last mail of a recent experience must compel us as yet to suspend a favourable judgment on this point. We are told that an expert tea-taster of eminence was able to at once pronounce, not alone as to the material used for enveloping the tea submitted to his judgment, but even as to the character of the enclosing chest. Such a result can have but a single meaning, viz., that the lining —in the case under notice, lead paper—was not impervious, and that it had permitted to pass through it and to be absorbed by the tea some inherent taint in the material of which the chest was composed.

Confirmation as to this has been supplied to us from other correspondence, which asserted that several of these lead-coated paper linings, when examined after receipt at home, were found to be perforated with innumerable small holes, the fact leading to the conclusion that the film of metal placed upon the paper had been too thin to resist the action of the acids exuding from the material of the chests, though, the perforation being so minute, they might have been caused by the action of damp alone. But it matters little how minute these perforations were. They may not have been as "deep as a well nor as wide as a church door"—to quote Shakespeare,—but what they lacked in size they made up for by their number, and it must be evident that any lining liable to become so affected must be untrustworthy, and that its use is therefore out of the question when so much of financial return to our planters is dependent on their produce reaching its several markets in a perfectly sound state. We learn from home that the fact of failure is fully recognized by those who have hitherto made trial of this proposed substitute for lead, and that they will abandon the further use of it.

We may conclude, therefore, that as yet what we require has not been found, and that we shall do wisely for the present to stick to our old and well-tried lead linings, however weighty the objections to their use may be. But our London Correspondent has sent to us by the mail a specimen of a newly-manufactured material on the possible success of which some hopes may be built. It would seem that, while sheet lead such as we use at present is unnecessarily thick and heavy, the leaded paper errs in the other extreme, that of the film of the metal being too thin. Possibly, therefore, a remedy is to be found in some material which shall provide the *juste milieu.* This the specimen of lead foil—as it is termed—that has been sent to us seems to provide. It apparently has body enough to resist the action of either a moderate amount of acid or of damp, while the paper lining added to it—if, indeed, it be paper—would prevent any contact between the tea and the lead. It is said to have the further

useful quality of uniting closely when a heated iron is simply passed over it, and our correspondent tells us that he has seen the edges of two pieces of this material so united. This facility will be much appreciated when it is compared with the labour of soldering the ordinary lead lining. Trial shipments are, we are told, to be made with this lead foil, and we hope they may have successful results. "When one door shuts another opens" goes the old saying, and we should welcome the assurance that we have to give up the hopes entertained of several lead papers hitherto tried, we may have the alternative before us of another possible solution to the difficulty our tea-growers now experience.

ANOTHER CASE OF THEFT OF CACAO FROM THE WARIAPOLA ESTATE; MATALE.

R. S. Fraser of Wariapola, Complainant, *vs.* Bandia of Hapuwida, Defendant.

CHARGE.—That the defendant did commit theft of five cacao pods (unripe) of the value of R1·25 property of complainant.

ROBERT SCARLETT FRASER sworn.—This accused was caught stealing in my cacao garden. His father was convicted of stealing cacao in my garden and was sent to jail for six months. The accused pleaded guilty and stated that he was drunk and did not know what he was doing. [The learned Magistrate thought it best to examine Mr. Fraser as to the story of the accused of being drunk. I saw the accused soon after he was caught. My conductor and watcher caught him. He lives in a block of land adjoining my cacao fields, but there is a paddy-field intervening at one end. He was not drunk in the least when he was brought up, though at times he simulated drunkenness. When he had occasion to speak, he spoke very freely. There was no smell of liquor on him. He walked perfectly freely and spoke freely and when standing stood perfectly steady but kept his eyes closed. Cacao is constantly stolen from my estate without any trace of the thieves.

JUDGMENT.—I find the accused guilty under the 368th clause of the Ceylon Penal Code. The cacao produced is perfectly unripe cacao; and though the value is not great the extreme prevalence of the offence in Wariapola demands the highest punishment I can give. I find the accused guilty and sentence him to undergo rigorous imprisonment for a term of six months.—(Signed) J. H. EATON, P. M. Dec. 29th, 1890.

In the case wherein Mr. W. S. Marshall, the superintendent of the Vicarton estate, charged his kanakapulle, Supaiyah, with neglect of duty and disobedience of orders, the accused was sentenced on both counts to two months' rigorous imprisonment. The accused has given notice of appeal. Full particulars will follow.

MR. SCOTT BLACKLAW ON BRAZIL.

CASABRANCA—COFFEE CULTIVATION—A HEAVY BEARING ESTATE—THE COLONISTS AND THEIR WAGES—MOCOCA BRANCH OF RAILWAY—PROVISIONS—SAO JOSE—END OF THE RAILWAY JOURNEY—TRAVELLING ON MULEBACK—TROLLIES—ROADS—AN ADVANCING TOWN—"COMETS"—RIO PARDO—GUAXUPE—LABOUR SUPPLY—GOVERNMENT ELECTIONS—THE EMPEROR'S PALACE—THE PROVISIONAL GOVERNMENT—EXCHANGE.

Rio, Nov. 2nd.

Casabranca is a considerable town on the Mogyana Railway, 171 miles by rail from Sao Paulo. Coffee planting was begun here about 1878, and as formerly mentioned the principal pioneers here were the Prados. The Fazenda of Antonio Prado, late minister of Agriculture, is not far from the town. I have mentioned that coffee is only planted on high lands, that is on lands at four or five hundred feet above the level of the surrounding country. Unless planted on these, coffee gets killed by the yearly visitations of frost in the cold months, extending from May to September. This Fazenda, named Santa Veridiana, has thus a commanding aspect, and the green hills closely covered with coffee trees are seen from a long distance. There is over a thousand acres in coffee, and the cultivation is entirely done by European colonists, Germans, Italians, and Portuguese. Each colonist family is given a solidly built house covered with tiles, and is also given pasture for cows and land, outside of the patch of coffee which is set apart for each family to treat,—to plant provisions. As this is a heavy bearing estate, seldom giving less than ten cwt. per acre, and as the colonist is paid according to the quantity of coffee picked, it is very popular amongst colonists. Judging by the number of houses one sees from the railway there cannot be less than 100 families. In good bearing coffee, a colonist family of five persons will pick from 1,200 to 1,500 boxes, of 50 litres each, in one season. The price paid to the colonist is twenty ponce (1s 8d or 800 reis) for each box of 50 litres (nearly a bushel and a half) of cherry. They have also the produce of the land, which each family cultivates for growing provisions. While they make butter and cheese, which they sell in the town, they also rear fowls, fatten pigs, and indeed each in himself is a farmer on a small scale. If the mother be thrifty the family can be kept from the provision-growing and and house alone, and the £130 or so received for coffee picked and weeded is saved money. Many of the colonists on this estate are rich and have money out at interest. This year (1889) the coffee estates along here are giving a heavy crop, but as the season has been a dry one all over the country, next year's crop will be a light one, as there have not been rains to send out young wood for the October blossoming season.

The most of the estates here are in good order, but it is said they are shorthanded for crops this year (1889) and a good deal of coffee will be lost and if not lost much will be gathered from under the trees and thus give an inferior quality. There are many more large coffee estates near Casabranca, From here the main line goes on to Ribeiro Preto direct west, and a branch goes north-west to Mococa, on the boundary between S. Paulo and Minas.

As our journey at present goes by the last named branch we will notice it first. Starting from Sao Paulo at 6 a.m. we arrive by train at Casabranca at 2·30 p.m., having travelled at the rate of 20 miles an hour including stoppages. I pity the traveller who has not taken something to eat with him, for there is such a confusion when changing at Campinas—from the 5ft. 3in. gauge to the 3ft. 3½in.—that he has no time to eat anything there, and the Portuguese sausages which one sees for sale at some of the stations are suggestive of grease, fat pork, and garlic, a kind of food which the average Briton cannot stomach. Some of our sandwich loaf, however, remained. All the same we were glad when arriving at Casabranca to be told that there was time for the passengers going by the "Mococa" branch to have dinner. The black-beans, rice, beef steak, and fowl, the last two being the only kind of cooked food from which the strong flavouring bulb I have mentioned is excluded, were ravenously eaten by us, and our Brazilian fellow-passengers had a fair "set to" at the joint of fat pork, mixing in their black-beans a cooked farinha made of Indian corn. If I can remember I may describe the way of making this baked flour later on.

A two hours' ride on the train takes us to Sao Jose do Rio Pardo. This part of the line goes principally through far-stretching campos covered with illuk grass, and in some places studded with small stunted trees, of a kind which seems to resist the action of the yearly fires, for every dry season these campos are set on fire if not by accident then out of pure mischief. There are however some stock farmers who believe in the yearly burning doing good, as cattle, horses and sheep greedily eat the young grass which seems to shoot up even without rain. The ground however

after this process of burning every year becomes dry and sandy, the sand being left lying between tho tufts of grass, while any organic part of the soil surviving the roasting is washed away.

It is a relief now and then to come to a hilly part where coffee can be grown, and we pass on the way some very fine coffee estates, some only coming into bearing and all having large clearings of young coffee, and large villages of European colonists' houses (mostly Italians). In about two hours we reach the town of Sao Jose de Rio Pardo, having passed two small stations among coffee estates. From Casabranca we have come in a north-easterly direction, and our journey ends here at Sao Jose as far as railway travelling goes. We have now for tho rest of our route to proceed on mule-back.

Before leaving Rio we had been directed to the hotel kept by Senhor Ananias, and the proprietor was himself at the station on the outlook for "Hospedes" for his establishment: more than that, he had a conveyance called a trolly to take them, and a mule cart to carry the luggage to the hotel. I think I have on former occasions described a trolly. It is not a Brazilian invention, but was introduced by some American contractor in the days when railways were young, adapting the idea from similar vehicles used for many years in the hilly parts of the Northern States of the American Union. It consists of four wheels on the axles of which are laid two eight inch boards on the flat, these act as springs, on them are fixed seats cross-wise for holding two each seat; some have two of theso seats and some three: indeed they can be made with any number of cross seats by adopting longer boards, and extending the wheel-base. The boards or (springs are of a timber called *Cabriuva*, or *Balsama* the latter name because the wood emits a strong agreeable scent, and a balsamic liquid is extracted for medicinal and surgery purposes) and are very strong: I have never heard of a case of any of them breaking. To allow for turning the boards are put closer together on tho foreaxle, through which goes a strong bolt; to the foreaxle to which is also attached the pole, for two or more mules; or the shafts if for one.

You will notice that this arrangement does not give much play to the lock in turning, and the unwary driver if he makes a quick turn and the inside wheel in turning catches on the board-spring, he may upset the "trap" and bring its living freight to the ground. If the trolly has to turn right round on a road the occupants must all come out, and the driver will then lift the hinder part to one side, that is to say he will himself turn it end for end, which he can easily do, as when empty the whole thing is very light; so in this way it can be turned completely round on a narrow road.

When tho writer came first to Brazil there were not many of these conveyances, and they looked very rudely made articles; any paint they had was engrained with mud or dust. But now, in the country-towns, trolly-making is a profession, and professional painters "do them up" with paint and varnish in a sort of artistic manner, and the trolly gets a good washing every day it is used. A nicely done-up trolly with seats for four will cost £40. My estate carpenter—a Scotchman—made me one to my own design, and I paid for the ironwork alone to a professional trolly maker £15.

In the trolly in which we were conveyed to the hotel there was yoked to it a large horse, a sort of kangaroo breed. All its action seemed to be in the hinder quarters, and as the only pace the animal had was a gallop, he took us through tho steep streets by genuine "leaps and bounds." And such streets—laid out on the face of a hill! About a hundred yards near the railway was flat, and a large square on which were situated the church and the jail was nearly so, but all the rest of the streets were at a gradient of one in three, or not to exaggerate they were like what "Willie Gordon" of Oodasgeria would call the "good old one in five." This was not the greatest objection to them, they were innocent of paving—although any quantity of workable granite peeped through the sides of tho hills near the town—and the heavy rains had made them full of ditches, ruts would be a mild name. Sometimes the axle of tho forewheels of the trolly would be at 35 degrees with the horizon while the hind wheels would be nearly on a level. Although they have not got farther in Sao Jose than a one-horse trolly, the citizens would be very much offended if a stranger called it "a one-horse town," for here is a centre of republicanism, and discussions go so high some times as to defy the authorities to keep the peace, and now (Sept. 1889) there is a detachment of soldiers, which had been sent up not long ago to keep the outrageous spirits within legal bounds. We learned through conversations with "mine host" and others, that the same Ananias who was driving the kangaroo horse was a rank republican and more so a decided socialist. He good-naturedly stated his opinion, and with a prophetic inspiration declared the monarchy doomed.

Senr. Ananias made us very comfortable at his hotel, gave us clean rooms and good food, but laughed at the idea of our thinking it possible to hire mules to continue our journey the next day. "No, no, senhores, we are an advanced people, but we must not be hurried. There are mules to be hired, but you must wait a day and then start at five next morning."

Next day we had an opportunity of noticing that Sao Jose was really advancing, new houses were springing up in all directions. The railway has been opened only for one year, and before it was projected there very few houses and population could not be counted above 300. I should say there were now 3,000 inhabitants. The bulk of the population is Italian, and the storekeepers, a great many of whom in addition to their *Casas de negocio* (retail shops) add that of *Mascatto* or podlar, nay some of them had large stores, and send goods on mule packs to the far interior, for at present this is the *ultimo thule* of this branch of the Mogyana. It is to be feared however that the opening of this branch as far as Mococa—near the boundary of Minas—Sao Jose will get a check in its advancing career as far as tho last mentioned branch of trade is concerned.

The day was not lost, for as our mode of travelling was to be on mule-back, and as we were to use our own saddles, some additions had to be made to our accoutrements, in the shape of extra cruppers, girths, saddle-cloths, and, above all, a breast belt for the saddle must not be forgotten, for the roads we had to go over were described by Ananias as steep and stony in some places, and having mud-holes in others that would try the best *graith* and the pluck of the best mules to get through them. We had guns and a fair supply of ammunition, but the country was described as so full of game; some extra shot suitable for what we were likely to meet had to be procured. Cartridge cases we had enough of, and knowing from past experience the wretched powder procurable in the interior I had brought from Rio a fair stock of Curtis & Harvey's powder, note this as the powder to be bought here has more smoke than penetration small shot for *snipe* and *codorno* (a small partridge) we bought 800 reis—(1s 8d) per kilo: and the small bullets, of which you put three in your gun, if you meet an *Ounca*, (a small tiger) we got for 600 reis (1s 4d) per kilo. All our luggage had to be arranged to go conveniently on the pack-mules, and many details, which many of your readers as old travellers, well understand had to be attended to.

The evening was agreeably spent, for with dusk came an advent of some three or four "Comets." In country hotels they generally make their appearance for the first time about dinner time; they are observable for perhaps a single day and two nights, and they continue their eccentric orbits, some having Sao Paulo as their centre, and some Rio de Janeiro, after short visits, to these little worlds in the interior. They disappear and return some months after. I do not know if your commercial travellers would feel honoured by such a name being applied to them, but those of that class here are proud of it. These gentlemen scour the country with samples carried on pack-mules, and take

orders from the traders in the towns, for the houses they represent in Rio de Janeiro, Sao Paulo, or Santos. They are intelligent, energetic fellows, sociable, and jolly in the evenings, and to the traveller visiting these Parts for the first time, they are living *encyclopædias* from which a great many notes of a very useful character, regarding the country one has to pass through, can be taken.

O Ananias! your name since my early infancy is connected with one who did not object to suppress the truth, and now that five o'clock has struck and daylight is breaking in sparkling golden lines away behind these high hills, there is no appearance of the mules which you said would be waiting before we could get out of bed. We were so anxious to catch the cool of the morning that night shirt, pijamas and slippers were put in the saddle-bags the night before in case the packing of these should cause delay.

I could hear no champing of bits, no snorting of animals. I opened the front door opening to the street, then the back door leading to the yard—all is vacancy and silence, except for that sonorous but inharmonious music of sleep given off from so many organs all over the house. Nor did Ananias himself turn out until six o'clock, and I believe that if he had not to get up to receive payment of accounts from "Comets" and others who had to leave by a train about 7·30 a.m. we might not have seen him then. He coolly answered if the mules did not come soon they must have broken out of the "Curral." (The Ceylon word Kraal comes from this). 8 a.m. no mules—we take breakfast—and by nine they appeared. I do not wish to libel Ananias, for different from his namesake of sacred history he had not a wife to aid him in his sacred councils, but certainly, he gained about four shillings on each of us, by our being so long in starting.

We are at an altitude of about 2,200 feet above the sea, and the air is cool up till nearly mid-day. Our ride was over rather steep roads for three kilometres. At the back of a range of hills, covered with campo grass and chena, we came to the river Rio Pardo—about 10 a.m. This would be 3 miles from Sao José.

The Rio Pardo (Brown River) has a characteristic name, for rising in a range of high mountains—a continuation of the Serra Negra, which I have mentioned before, as dividing the undulating plateaus of Sao Paulo from the rough mountainous campos of Minas Gerães, and although running here slowly, shows by its brown water that it is fed by many a mountain stream, and has already received the drainage of many square leagues of land. Here its width is about 100 yards.

There is a ferry boat here, but a more rickety affair could not be conceived. The construction is of two trees dug out placed parallel, about three feet apart, and a few loose boards crosswise on the top. We were not very confident that the other side would be reached without a ducking. I made sure our mules would object to this mode of crossing, but no; the old negro who acted as ferryman got a hold of the reins and the animal rode, with very little hesitation, jumped aboard, but we could not wish another four-legged passenger, for the loose boards were all curled with the sun and many were broken, and out of place, besides the canoes seemed to get their ballast increased by a considerable addition of water, so we shoved off. To lessen the risk of foundering I had to give the boatman a hand in the rowing of our frail craft and living cargo to the other side. The landing in the mud at the other side was a more serious matter. The only accident however was the soiling of my riding boots and my clothes getting ornamented by some cakes of mud having been thrown up through the floundering of the mule in reaching terra firma. One by one we had to cross, and this delayed us very much, particularly since some of the other animals were either obstinate or not well educated in crossing rivers in such a fragile craft.

After crossing the Rio Pardo we had to ascend a steep hill on patana land. Then we went for five or six miles through some magnificent forest trees with trunks of large diameter and of collossal height, creeping shrubs with flowers of varied hues, while the singing birds of all sizes and colours had not yet ceased their morning song, and mingling amongst the music of the forest the home of insect tropical life, and the shrill drones of the many crickets and cigaros (a large tree cricket) gave to these parts the enchanting charms which a traveller in the tropics loves to dwell amongst, but can with difficulty describe several hills of forest similar to this alternating with ridges, and plains of campo were crossed. The soil is of the rich Terra Rocha, the finest soil for coffee as yet known. All these forest lands are however in the hands of wealthy owners, and will by-and-by be laid low for planting the favorite coffee bush. There are still many square miles of these forest in these regions. These are not likely to change hands but they will be turned to profitable account by the present proprietors as soon as the labour difficulty is successfully solved.

Game in the bird line was plentiful, both in the forest and on the wide expanses of campos through which we passed that day, but we had started late in the day and had 36 miles to ride before dark, so we could not wait for shooting.

All along this road there were neither resthouses nor bazaars (or vendas as they call them here). We stopped at a native hut by the side of our road and got an old negro woman to make us some coffee, while we discussed some fowls' wings and legs, which Ananias had supplied us with as a bite on the road. The day was cool and, barring the steep sides of hills, the stony fords, and the mud-holes, the journey was agreeable. We reached the end of our day's ride at a town called Guaxupe about an hour before dark. Our route all day had been in a north-westerly direction, the province of Sao Paulo being left behind us at S. José.

Guaxupe is an Indian name, and is given to this small town of some 1,500 inhabitants and which boasts of only one church, while many of the same size in Brazil have three or four. There is an hotel called the "Reteiro dos Vigantes" (the Travellers' Retreat). The culinary and eating departments are on one side of the street and the sleeping and travellers' retreating apartments, on the other. Our bath was taken in a large galvanized basin which we considered quite a luxury. A bullock had been that day killed, and we had plenty of rational food for this our first experience of Minas hotels. The hotel happened to be full and my friend and self had to sleep on the floor of the "salle," or sitting-room. Some pleasant days were spent here and I did not get promoted to sleep on a bed all the eight days I stayed at the Retreat.

Coffee planting is the principal agriculture here. The planters have not suffered from the emancipation to the same extent as in many districts, as the principal labour has always been the *camarada* or half-caste between the white and the Indian. Although not slaves they are accustomed to work in gangs.

The landowners here hold only small pieces; the farmer in many cases works with his labourers in the field, and feeds along with them—thus getting the maximum amount of labour out of them. Coffee is dried in the cherry and sent to some central mill, or to some neighbouring proprietor who may have erected coffee cleaning machinery, to be prepared for the market. Many of these seemingly poor farmers are making money owing to the high price of coffee, and the railway coming so near to them. The colonist system of labour is almost unknown here, but will gradually follow after its success in the province of Sao Paulo. As I have some duties in the interim which will occupy some five months I will not be able to return to the Coffee Districts of S. Paulo for that time, when I intend to give a short account of the greatest of Brazil's coffee centres—that of Rebeirao Preto, and these notes will then come to a close.

You will have seen by the European papers that our elections have passed quietly over, the candidates of the Provisional Government having gained all along the line. The Deputies and Senators are now wending their way to the capital, to take their places in Congress which is to meet in a few days.

The Emperor's palace, situated on a nice picturesque piece of ground overlooking the beautiful bay of Rio de Janeiro, is being fitted up for the deliberations of that important body. After some days spent in formal business their duties will be to approve the Constitution, and to elect a President and Vice-President. It is said in some quarters, that, this business done, the two houses will be prorogued until May, by which time each province will have received its constitution and will have thus consolidated the Government by a Republic composed of Federal States. It is expected that after the election of a President all the European powers, which have not as yet done so, will recognise the Estados Unidos do Brazil. The principal acts of the Provisional Government have been generally approved by the nation, but many differences of opinion have been expressed regarding its financial policy. Exchange however is now rising and the value of the milreis is two shillings. All duties have now to be paid in British sovereigns at par or 27 per milreis.

A. SCOTT BLACKLAW.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Dec. 4th.

ANNATTO.—There have been larger arrivals of seed from Ceylon this week, two vessels bringing 278 packages.

CINCHONA.—The bark supply offered at Tuesday's auctions was a very moderate one, consisting of:—

		Packages		Packages	
Ceylon bark	...	1,064	of which	971	were sold
East Iudian bark	...	684	do	623	do
Java Bark	...	75	do	75	do
South American bark		234	do	171	do
West Coast African		221	do	156	do
Total	...	2,278	do	1,996	do

The assortment was not remarkable in any way, except for the unusually large consignment of bark from the African West Coast included in it. There was a small quantity of good Ledgeriana bark from the Wentworth plantations in India, and also a few lots of fine renewed Succirubra, but most of the bark was of ordinary or medium quality. Competition was brisk, and the improved tone of the market enabled holders to realise a slight advance on the previous auctions, the unit for good barks being 1⅝d per lb., and the average fully 1½d per lb.

JAVA CINCHONA.—Original: Succirubra stem quills, bold and long, but damaged, 6d to 6½d; dusty stem chips 3½d; ditto root 3d to 3½d per lb

SOUTH AMERICAN CINCHONA.—Of 230 packages of cultivated Bolivian Calisaya, 171 pkgs. sold at full prices. Quilly chips, 4d to 4½d; medium to long fairly bright stem quill 5½d to 7½d per lb. Four cases (416 lb.) red quill, thin, damaged and colourless, imported via Hamburg, were withdrawn.

WEST COAST AFRICAN CINCHONA.—No less than 221 bales (28,269 lb.) of bark grown in the Island of Sao Thomé were offered. The bark was imported in two consignments, via Lisbon, and 156 bales of it (19,169 lb.) sold at comparatively good prices to German quinine makers and French druggists. Calisaya and succirubra hybrid medium quill, fairly bright, but damaged 4½d to 5d; chips and shavings 3½d to 4½d per lb. The greater part of this parcel was slightly damaged. The exports of cinchona from Java during the three months from July 1st to September 30th, have been as follows:—

	1890 lb	1889 lb	1888 lb	1887 lb
Govt. plantations, Amst.	64,208	18,264	148,749	170,295
Private ,,	1,595,818	987,641	986,363	864,391
Total	1,660,026	1,170,283	1,065,112	1,034,686

COCOA BUTTER.—At the monthly auctions, which took place here on December 2nd, 300 2-cwt cases of Cadbury's brand sold at prices ranging from 13¼d down to 12⅝d, closing at about 13d, the result being a decline of about 1½d per lb as compared with the November auctions. On the same day 70,000 kilos of Van Houten's cocoa butter (A) were sold by auctions in Amsterdam. They realised from 68¼ to 70½ cents per ½ kilo, equal to about 12¼d to 12½d per lb., or rather less than the prices paid in London.

OILS (ESSENTIAL).—Citronella is worth 13-16d per oz. on the spot for fair native quality, and for arrival 11½d per lb. c. i. f. is asked for tins. Lemongrass oil on the spot is 1¾d per oz., and for arrivals the quotation is 1½d per oz. c.i.f. terms.

OILS (VARIOUS).—Coconut Oil: Ceylon steady, at 31s 6d for fine quality on the spot, while for near at hand 28s d, c. i. f. terms, is quoted. Cochin has advanced, and is now worth 33s 6d to 34 6d on the spot according to quality, while for distant delivery 32s 6d, c. i. f. terms, is asked.

QUININE.—There has been a somewhat better feeling in the market this week, although the sales reported only amount to about 40,000 oz.—second-hand German bulk at 11¾d to 12d per oz., and some Brunswick, from the makers', at 12d per oz. for April-May delivery. There would be further buyers at 12d per oz. for forward delivery now, and also 11¾d per oz. spot, but there is nothing to be had at those figures. The B. & S agents have refused all offers below 13d per oz. for January-February, and hold firmly at that quotation.

A PAMPERED RAILWAY COMPANY.

Mr. Geo. W. Christison, a Darjeeling tea-planter and Manager of the Lebong Tea Company, Limited has begun a strenuous agitation against an important public grievance, in regard to which some correspondence has appeared in the *Englishman* lately. Mr Christison, for the first time, tries to bring an organised protest, and Government pressure, if possible, against what has been generally known as the excessive cupidity of the Darjeeling-Himalayan Railway Company, fostered as it is by the indulgence of an over-lavish Government. Although subsidised from the public funds to an extent that no railway in the country has been, the public interest is the last thing it seems to look to, payment of a large dividend to shareholders and fat salaries to officers appearing to be its sole concern. The rolling-stock it maintains is far from adequate to the demands of the traffic along the line, so that in busy and rainy seasons goods accumulate at the stations to the great loss of importers and exporters, notwithstanding that bullock carts still carry a good deal of the traffic. The consequence is that, in order to secure a large dividend from a comparatively small traffic, the rates have been kept up from the beginning at exorbitant figures, though it has been amply proved that, with some present sacrifice by laying out money on rolling-stock and improving arrangements, the rates could be considerably reduced without any permanent loss to the income of the Railway.

Passenger fares by the Darjeeling-Himalayan Railway for first and second classes are four times as high as those on the Eastern Bengal State Railway, and third class fares more than six times as high as on the lowest class of the Eastern Bengal State Railway. Parcel rates are higher for 5 miles of the Darjeeling-Himalayan Railway than for 328 miles of the Eastern Bengal State Railway. With regard to goods generally the highness of the scale will be understood when it is known that the price of coal together with freight from Naihati to Silligorie (305 mile) amounts to very much the same as the charge for freight alone over the 51 miles of Darjeeling-Himalayan Railway from Silligoorie to Darjeeling.

In response to strong representations for reduction of rates made by the Darjeeling Tea Planters' Association, of which Mr. Geo. W. Christison is a leading member, the Darjeeling-Himalayan Railway has offered a rebate of 5 per cent on coal and 7½ per cent on all other goods. But Mr. Christison regards this to be utterly inadequate to meet the necessities of the case, and he urges upon the Association to press for more, and if accepting the terms offered by the Darjeeling-Himalayan Railway not to bind itself to keep quiet for the next five years, as is stipulated for by the former. In one of his circular letters addressed to the members of the Association through its Secretary, Major Harrison, Mr. Christison writes:—

"It is very evident from the paltry reduction upon coal (the most important of all) where the difficulty lies. If a proper reduction were made, the increase of traffic would be such that the Railway could not carry it. It therefore is the duty of the Association to go to the root of the evil, and induce the Railway to increase its rolling-stock and otherwise improve its arrangements in regard to stations, godowns, cranes, &c., and, if necessary, even

petition Government for this. The line is clearly being worked for the immediate profit of the shareholders, and not for the good of the public. Government has granted the Railway vast concessions in the public interest and would certainly insist upon it making proper arrangements for the public traffic if a strong representation were made in the proper quarter. It is calculated by the best authority that ten lakhs are needed to provide rolling-stock, and otherwise put the line into proper order. The raising of this extra capital might affect the dividends for a time, but the shareholders would ultimately be gainers as well as the public."

The "concessions" referred to in the above paragraph are six very substantial ones, besides others of a minor nature. These are (1):—Free use of the Cart Road between Silligoorie and Darjeeling, said to be one of the best of its kind in the world, for the laying of the lines of the Darjeeling-Himalayan Railway. (2) In regard to the maintenance of this Cart Road the Railway Company is in the position of contractors to the Government, being paid for on a most liberal scale of rates, with 15 per cent. added for tools, plant, and supervision, the landslips being looked after by the Government for the first five years, and still very largely, if not entirely. (3) A most liberal subsidy for the carriage of mails. (4) Free use of Silligoorie Station and appliances till the line makes a clear dividend of 7½ per cent. (5) All materials for the Darjeeling-Himalayan Railway carried at a reduction of 40 per cent. on the minimum rates over the Northern Bengal State Railway. (6) On completion of contract, the Government to take over the line at the market priceof shares plus 25 per cent. premium on such market price. The grant of the use of the Cart Road saved the Darjeeling-Himalayan Railway Company 50 lakhs, and it has recently obtained exemption from payment of road and public work cesses.

In view of these concessions from the public funds, and presumably in the public interest, Mr. Christison rightly insists, and hopes that a fair reduction in the rates for goods, particularly for coal, may be obtained, and better arrangements made for the carriage of the traffic. Other railways have borne the whole cost of their construction, and without any such concessions manage to offer rates immeasurably lower, paying themselves fairly and furnishing every necessary convenience to the public. Over and above the high charges, not the least of the inconveniences by the Darjeeling-Himalayan Railway, is the discreditable delay that takes place in the transit of goods owing to the insufficiency of rolling-stock, so that godowns are often reported blocked, and goods have to lie exposed in the rains; while a good deal of traffic is carried yet by bullock carts and other modes of conveyance that ought, with fair rates and better arrangements, to go by rail. Mr. Christison suggests that the number of carriages and waggons of the Railway should be increased together with a reduction of rates, and a fourth class should be provided for the poorer classes 50 per cent cheaper than its present third class particularly as so many coolies have to be transported over it. He further declares that instead of the 5 per cent reduction on coal offered by the Darjeeling-Himalayan Railway no less than 33⅓ per cent would be fair, and even 50 per cent would not be unreasonable or out of proportion to the rates for coal charged by other lines, while in place of the 7½ per cent general reduction offered under other heads, 10, 18, 20, 25, 40 and even 56 per cent on different goods "would be fair, and nothing more." These contentions are supported by an array of statistics carefully collected and arranged so that there can be no two opinions as to the conclusion they lead to. Mr. Christison points out that the reduction now offered by the Darjeeling-Himalayan Railway Company, so as to draw the Darjeeling planters into an agreement to keep quiet and send all their goods by the Railway for the next five years, is a repetition of Mr. Prestage's old bribe (with an addition of 2½ per cent) to get the Darjeeling Carrying Company closed and thus have a monopoly of the traffic over the Cart Road. "The Agreement," remarks Mr. Christison, "is unworthy of any railway. Certainly, if the Association, as well as the individual members accepting, are to be bound hard and fast for five years, and other routes to be closed, the rebate is not worth the sacrifice." Mr. Christison would rather have the cart traffic revived on its old scale if the Darjeeling-Himalayan Railway does not come to terms. The common rates by bullock carts from Silligoorie to Darjeeling vary from 6½ annas to 8 annas per maund—10 annas and upwards in the rains being rather an unusual fare, and 9 annas per maund being rarely paid by those who carry regularly and understand the business. Taking 8 annas as the average rate, it is little over half the charge by the Darjeeling-Himalayan Railway if down traffic (which includes large quantities of tea) be allowed for.

Mr. Christison has taken up a very good cause, and he deserves the support of all sections of the public. He is fighting in the interest not alone of the Darjeeling tea planters, but of the public generally to whom the Darjeeling trade and Darjeeling as a place of business as well as sanitarium, are daily growing to be of greater importance. HOPE.

—*Indian Planters' Gazette.*

TEA CULTIVATION IN JAVA.

The Italian *Bolletino Consolare* gives the following account of the present condition of the tea industry in Java:—

The cultivation of tea in the Dutch Indies is practically confined to the island of Java. It is mainly carried on in the province of Preanger, in the western part of the island, where it is rather a part of horticulture than of agriculture. The industry is in the hands of experienced planters, who are sparing no pains to increase the prominence and quality of the Java teas. Notwithstanding their care, however, as early as in 1887, they could not congratulate themselves on the price of their article. In 1888 it continued to fall, and the planters were forced to expend their utmost energy on saving their plantations from ruin. This was the case not merely with recent enterprises, but with old plantations, that had flourished for many years. The weight of this depression fell, of course, on the native population, which until then had obtained a comfortable livelihood by the cultivation of tea. The quantity produced on the Java tea plantations scarcely fluctuated in the three years, 1886, 1887, and 1888; it remained at about 325,000 kilos. per annum.

In addition to this steady decline in price, the Java tea plantations have been ravaged by an insect (*Helopoletis antonia*), called Boedock Hamand in Malay, and Theluis (tea-louse) in Dutch, which each year destroys in value hundreds of thousands of florins. It is needless to add that the planters have offered the most liberal rewards to any one who will devise an infallible mode of freeing them from this devastating foe, but hitherto with as little success as in the case of the diseases of the coffee-palm and the sugar-cane.

At the same time there is noticeable a distinct improvement in the quality of the Java teas. Until lately, on account of the quantity of tannin which it contains, the Java tea has only been bought in Europe when mixed with China tea; but the improvement of the quality has now rendered that needless, while the cultivation of Assam plants will presently enable the planters to compete with Ceylon and British India. Nor must it be forgotten that during the last two years great improvements have been introduced in the preparation of the tea. The most recent inventions have been applied, and nothing which is happening in Asia, which can be of any utility to the Java tea planters, is permitted to escape their attention. For many years past it has been proved that the climate and the soil of Java are perfectly adapted to the cultivation of tea, and are powerfully aided by the regular rainfall in that mountainous country, which produces an abundant growth of leaves.—*L. and C. Express*, Nov. 28th.

POTATOES AS PEN WIPERS.

One of the chief woes of the ready writer, be he clerk or what not, consists in the fact that he no sooner gets a pen into good working order than it, like the "dear gazelle," comes to an untimely end from the corrosion caused by the ink. Life is not long enough to use and mend quills, nor to apply with delicate firmness the pen wiper to a steel one. But some genius has now hit on a solution of the difficulty which has the merit of the most extreme simplicity. In many offices, we are informed, a potato is used instead of a pen wiper. The juicy tuber holds the pen steady, removes at once all ink from the nib, and prevents, or at least very greatly delays, the process of corrosion, and spares many a well-loved pen to a ripe old age.—*Pall Mall Gazette.*

CURIOSITIES OF MISNOMER.

Black lead is not lead at all, but a compound of carbon and a small quantity of iron. Brazilian grass is not grass, and never saw Brazil—it is nothing but strips of palm leaf. Burgundy pitch is not pitch, and does not come from Burgundy; the greater part of it is resin and palm-oil. Catgut is made from the entrails of sheep. Cuttle-bone is not bone, but a kind of chalk once enclosed in the fossil remains of extinct specimens of cuttlefish. German silver was not invented in Germany, and does not contain a particle of silver. Cleopatra's Needle (the obelisk now in Central Park) was not erected by the Egyptian Queen who "lost Mark Antony the world," nor in her honor: nor has that other Egyptian monument, known as Pompey's Pillar, any historical connection with Pompey in any way—beiog erected by or in honor of a very different Roman, Diocletian, and it ought to be known by his name.

Sealing-wax contains no wax at all, but is composed of Venice turpentine, shellac and cinnabar (or red lead). Turkish baths did not orginate in Turkey, and are not baths, properly so-called, but rather heated chambers. Whalebone is not bone, although it does come from the leviathan for which Nantucket, New Bedford and Sag Harbor used to make those three-year voyages; moreover, it is said not to possess a single property of bone.

Truly, it seems that the nomenclature of common things is not unlike that celebrated definition which the French Academy of Sciences once made of a crab—"a small red fish which swims back ward"—and of which Cuvier remaked that "the crab was not a fish, it was not red, and it did not swim backward—but that otherwise the definition was admirable!"—*Providence Journal.*

SISSAL FIBRE.

Mr. Benson, Assistant Director of Agriculture, Madras, in continuation of previous correspondence, writing on the 8th May said:—"In reply to your letter dated 3rd instant, for which I thank you, I have the honour to inform you that I have communicated the contents thereof to my correspondent, and I will let you know the results. In the meantime you may be interested in reading the following extract from a letter received from the Director, Botanical Department, Northern India, regarding the plant, from which it would appear that there seems to be some doubt as to the Sisal hemp being obtained from a plant not already introduced."

"*Extract.*—Sisal hemp is said to be yielded by Agave Sisalana. This is probably only a variety of the American plant called *Agave vivipara*, which is abundantly cultivated as a hedge plant in various parts of India, and is largely used for fibre in Upper India. Any number of bulbs or small plants could be sent to you from Saharunpore, but as the carriage would be expensive, it would be better to arrange for a supply nearer at hand. It is mentioned on page 118 of Dr. Bidie's catalogue of the Raw Products of Southern India."

Mr. D. Morris, of Kew, writing in April in reply to inquiries, said:—"We have very fully dealt with Sissal Hemp in the *Kew Bulletin*, and last month we gave some additional information in treating of Bombay Aloe fibre. This letter was not before you when you wrote. The greatest difficulty would be experienced in obtaining plants of Sissal hemp from Yucatan or the Bahamas. We have, however, established the fact, that the true Sissal hemp exists in the Turks Islands, dependencies of Jamaica, and also in Florida......As regards machines there are, no doubt, several in use in different parts of the world. For instance, in Mauritius they have a very simple and apparently satisfactory machine, which has been used for several years. This cleans the leaves of the Furcrœa gigantea. In Yucatan they have the Death and Ellwood Machines, I believe, but they also use another machine somewhat similar to the Mauritius machines. A full account of this last will appear in the *Kew Bulletin* for May. When the subject is sufficiently advanced to import machines for cleaning Agave leaves on a large scale in India, I have little doubt that either the Mauritius or Yucatan machines will be found to afford adequate results, or failing these, there is a new machine brought out by the Death Fibre Machine Company which is said to be a great improvement on all former machines."

Since Mr. Morris' letter was received, the Kew Bulletin for May is to hand, with a description by M. de Chazal of the machines used in Mauritius for cleaning aloe fibre. The subject will receive careful attention, as there can be no doubt that in many parts of the country the species of Agave, common in India, could be made to yield handsome returns, as it will thrive on land unsuited for ordinary crops. One of the members of the Society's Committee remarks as follows about the fibre of this plant:—"Aloe fibre becomes more valuable when the price of Manilla hemp is high, and there is more fluctuation in Manilla hemp than any other fibre. It is not merely supply and demand but, being a centralized and comparatively small business, it is a favourite for speculation, and the price is forced up often 50 per cent., suddenly. It has so happened for the last two years. Just now the price is low. It is when the price of Manilla hemp rises so high from speculation, that other fibres, such as aloe, are more in demand."

No doubt with a large steady supply of the fibre existing in the country, special uses would be found for it. Messrs. Harton & Co. of Calcutta, produce a very lasting and neat matting, somewhat like coir, but finer, from this material, samples of which will be sent to Kew to show what is already done in the country with hand cleaned fibre.

In connection with the subject of aloe fibre, read the following letter to the Deputy Secretary from Messrs. Smith aud Neale, Bridgeport, Connecticut:—

"I have seen an article written by you copied in the "Scientific American" relating to Pine-apple fibre. I am thoroughly posted on fibre machinery, and could get you up a simple and good machine for getting the fibre out of the leaf in an expeditious manner; so it would be in good shape to be fed into drawing frames and cards. I can make the machine small and light running, so it can be worked by hand or foot power, horse power, or steam power. It would be necessary for me to know the extreme length of the leaf, and if I had a small quantity of the leaf, I could run it through the machine and send it on to you. I understand it ought to go through green so as to save the fibre. I think I could build a light running foot power machine that would turn out 250 lb. per day, hackles in good shape for the Drawing Frame."

In acknowledging Mr. Neal's letter, he was informed that though the Society was not prepared to buy the machine, that should he send one for trial, it would be carefully tested, and a full report sent to him.

Should the machine prove a success, he could be put into communication with people in India who would be willing to negociate with him for working it commercially.—*Agricultural and Horticultural Society of India.*

Handbook of Agricultural and Commercial Concerns in Netherlands India.—From Mr. J. H. de Bussy of Amsterdam we have received the third annual issue (for 1890) of the "Handboek voor Cultuur-en Handels-Ondernemingen in Nederlandsch-Indië." This is a most useful work containing information regarding the various estates, firms, &c., in the Dutch East and West Indies arranged in alphabetical order and with indexes of names. The Government regulations for the cultivation of land and the cooly ordinances are also given. The whole, however, is in Dutch which to most Ceylon planters is "double Dutch."

The Calcutta Incinerator.—Mr. Harrington writes as follows:—The incinerator is to be relighted on 6th December. The alterations that have been effected are—(1) The chimney has been heightened from 130 to 200 feet, (2) A powerful smoke crematorium has been constructed, (3) Self-acting hot air blasts have been introduced, which pass through the hottest part of the refuse furnaces on to the smoke crematorium; and the smoke crematorium chamber is so intersected with reverberating cross walls of heat absorbing material that a very high temperature will be maintained therein. After these alterations and when the incinerator has become fairly heated, Mr. Harrington anticipates that there will be but little smoke escaping from the chimney.—*Indian Engineer*, Dec. 6th.

How He Planted My Potatoes.—The piece of ground would be about 150 square yards in area, so rather less than 5 rods, and was sheltered and warm, and had been long under cultivation. The last digging it had got was when the winter frosts had departed, some time late in March. Johann was furnished with the ordinary Croatian hoe, fitted on a handle of about 2 feet 6 inches long, and with the heart-shaped blade, and bending low, was scooping out the shallow basins destined to receive the sets at the stretch of his long legs apart—that is, about 3 feet 6 inches. I could see that the quantity of "seed" required would be much less than by the English mode of planting; but I did not expostulate much with him about it, although I imagined that my crop would be a light one. The sets were duly planted, and the ground made level with the aforesaid hoe. Under the hot sun of Southern Moravia the shoots soon came above ground, and here another surprise awaited me; for when their earthing-up became necessary, my Croat, instead of drawing up the earth in long ridges, in English fashion, made a little rounded hillock around each stem, or bunch of stems, and as the tubers grew, and the hillock distended under the pressure of growth below, more soil was drawn to it; but at the finish each set had its own hillock of mould, independent of its neighbours. This form of earthing-up allowed the haulm, which was strong, to lay on the ground, between the hills, and not on them, so that had disease attacked the Potatos, the spores of the Peronospora would have mainly fallen on ground which contained no tubers; moreover, the sun's rays shone on every part of the haulm—a matter of great importance in plant growth, more especially if the growth be of short duration. The crop of Potatos was enormous, and measured from three-quarters to 1 peck at a root, which, at that rate, was 150 pecks for the 5 rods of ground planted. I felt that the foreigner, with his inborn common sense, had taught me a useful lesson; but it was only one among many that had still to be mastered. *Recollections of an Englishman Abroad*—*Gardeners' Chronicle.*

Tank Ships in the Nitrate Trade.—A new departure in the construction of ships designed for the nitrate trade was heralded by the launching of the largest sailing ship in the world the other day, says the London *City Leader.* This ship is remarkable, not only for its size, but for the arrangements made to preserve its cargo. Nitrate of soda has a strong attraction for water, absorbing so much of it from the air as to be dissolved by it in large quantities when in bulk. The custom is to discharge this nitrate liquor overboard, and so lose it, but on the new vessel special tanks are fitted in the hold, into which the liquor drains.—*Bradstreets.*

The Technical Experts who, under the direction of Sir Colin Scott Moncrieff, have been to Merv for the purpose of examining the state of the irrigation works carried out by the Russian Administration in Central Asia on the Czar's estate in that region, have returned to St. Petersburg, bringing very unfavourable reports of the condition of affairs. The Administration had proposed to effect the irrigation of about 250,000 acres of land, but from the Engineer's report it appears that there is no hope of irrigating more than about 32,000 acres at the outside.—*O. Mail.*

The Yield of Mariawatte, 1,347 lbs. an Acre!—This is certainly a splendid record, whether we take the old 100 acre plot or the whole of the large acreage under tea. From our old files we find that the following has been the yield of this far famed field of tea for the past seven years:—

1884	...	1,092 lb.	made tea	per acre.
1885	...	1,178	do.	do.
1886	...	1,059	do.	do.
1887	...	1,126	do.	do.
1888	...	1,033	do.	do.
1889	...	1,105	do.	do.
1890	...	1,347	do.	do.
Average of 7 years		1,133	do.	do.

Potato Disease.—Time was when it seemed as if we had no means of arresting or mitigating this plague. But now we know that by proper modes of planting, adequate moulding, the selection of suitable kinds, or the use of sulphate of copper solutions, we have the means of controlling the disease to a large extent. But although each of these methods has been made known widely, very few have availed themselves of them. They are specially suited for the cottagar, the allotment gardener, and the cultivator on a small scale, and it is disappointing to see no effort at all made to mitigate the pest. What is still more disheartening is to witness the utter apathy with which even intelligent cultivators allow the disease to be propagated wholesale by their carelessness and their almost incredible negligence, which ensure the best possible means of facilitating the growth and dispersion of the fungus.—*Gardeners' Chronicle.*

Cinchona Planting in Java.—An extraordinary general meeting of the shareholders in the West Java Cinchona Company was held in Amsterdam last week, when the managing director, Mr. M. J. Boissevain, submitted certain proposals which seem to indicate that the undertaking is hardly so prosperous as its proprietors could desire. It was proposed that of the four plantations belonging to the company—viz. Tjiseureuh, Bajabang, Pangairan and Tjidoerian—the two former shall be entirely uprooted. The proceeds of the bark thus obtained are to be used to reduce the share capital of the company. It is estimated that the capital will by this method be reduced by about 30 per cent., and it is hoped that the two remaining plantations will yield a sufficient profit to admit the payment of a fair dividend on the reduced capital. The proposal, which was the result of an investigation of the company's plantations by an expert, was unanimously agreed to.—*Chemist and Druggist*, Dec. 19.

NOTES ON PRODUCE AND FINANCE.

THE SICK MAN OF CHINA.—The outlook for Chinese tea-growers is gloomy in the extreme. If India and Ceylon supply 75 per cent of the tea consumed, and this is the estimate, tea-growing in China is a bad business. Since Ceylon planters turned their attention to tea new life has been imported into the industry, so far as British enterprise is concerned. There has been no hiding of light under a tea chest. The advertisement business in various forms has been well worked, and so far from injuring their fellow-planters in the Indian tea districts by their trumpet-tongued announcements, the Ceylon planters have helped to a well the consumption of Indian as well as Ceylon tea. China is the sufferer, and a very acute one.—*H. and C. Mail*, Dec. 12th.

STAPLE EXPORTS: TOTALS FOR 1889 AND 1890.

From the Customs Tables we take the returns up to the end of December. It will be observed that last month shewed a good deal of activity in the shipping of Tea, Cinchona, Cocoa and Coffee. The total exports for 1890, according to the Customs accounts (which differ from those of the Chamber of Commerce) show 44,869,015 lb. of tea, an increase of over 11 million lb. on 1889: 8,720,287 lb. cinchona bark, a decrease of 600,000 lb.; cocoa, 15,697 cwt., a decrease of 3,000 cwt.; while coffee of all kinds shows a slight increase:—

1889. Months		Coffee Plantation. cwt.	Coffee Native. cwt.	Coffee Liberian cwt.
January	...	10,941	1,868	19
February	...	12,283	1,861	72
March	...	4,567	799	65
April	...	1,313	1,582	97
May	...	1,215	852	70
June	...	4,139	867	113
July	...	7,533	25	54
August	...	11,608	181	90
September	...	2,917	131	85
October	...	2,415	121	8
November	...	5,666	268	13
December	...	12,610	142	21
		77,207	8,697	707
1890				
January	...	19,857	966	258
February	...	16,615	131	82
March	...	10,463	666	497
April	...	1,578	1,380	401
May	...	3,056	726	734
June	...	4,803	524	255
July	...	6,797	256	194
August	...	4,324	42	207
September	...	1,920	314	87
October	...	3,115	313	241
November	...	4,010	159	46
December	...	3,519	236	56
		80,057	5,713	3,058

1889. Months		Tea. lb.	Cocoa. cwt.	Cinchona. lb
January	...	2,663,041	3,915	1,076,700
Februar	...	2,089,615½	2,328	834,106
March	...	3,522,929	1,733	813,345
April	...	2,631,082¾	540	1,026,177
May	...	3,600,608	227	827,732
June	...	3,685,857	1,130	559,196
July	...	2,702,241½	1,210	365,758
August	...	2,729,904¼	1,553	1,035,454
September	...	1,604,147	412	659,977
October	...	3,030,324	45	675,818
November	...	2,615,628	274	735,903
December	...	2,847,234	5,262	715,562
		33,752,612	18,629	9,325,728
1890.				
January	...	3,293,325	3,905	520,311
February	...	3,156,583	2,111	741,815
March	...	3,407,883	1,937	796,090
April	...	4,122,827	1,338	699,921
May	...	4,791,586	906	874,650
June	...	4,996,447	633	617,942
July	...	5,256,538	1,077	658,982
August	...	3,400,975	697	978,762
September	...	2,944,883	83	640,847
October	...	3,143,204	260	989,377
November	...	3,351,560	1098	592,221
December	...	3,003,201	1652	579,369
		44,869,015	15,679	8,720,287

THE CEYLON EXPORT SEASON FOR 1890.

RATES OF PRODUCE AND FREIGHTS ON COFFEE TRADE.

	Middling Plantation Coffee per cwt.	Coconut Oil Per ton.	Per Unit of Sulphate of Quinine.	Cin. Twigs & Branch. per lb.	Cinnamon per lb.	Plumbago per ton.	Rice per bag.	Steamer Freights per ton to London.
1889	s.	R	c. c.	c.	c. c.	R R	R c. R c.	R c. s. d.
Dec.	102	200	7 to 11	—	34	210 to 250	8 30 to 8 75	— 40 to 45
1890								
Jan.	103	310	7 to 11	—	—	190 to 230	7 50 to 8 00	— 40 — —
Feb.	104	305·75 to 305	8 to 13	—	—	180 to 215	7 60 to 8 36	— 6 to 35
March	102	305	8 to 12	—	31	190 to 200	7 65 to 8 —	— 30 to 35
April	100	290	8 to 10	—	30	170 to 200	7 25 to 8 25	— 30 to 40
May	101	290	7 to 9½	—	30	190 to —	8 25 to 8 65	— 35 to 40
June	103	295 to 300	6 to 9½	—	34 to 34	145 to 168	8 00 to 8 65	— 26 — 35
July	102	310 to 312·50	6 to 8	—	34 to 36	170 to 215	8 60 to 8 70	323 6 — 35
Aug.	105	300 to 305	6 to 9	—	34	170 to 220	8 50 to 8 65	27 — to —
Sept.	105/6	322·50 to 330	9½	—	32	170 to 240	8 50 to 8 70	— 32 to 36
Oct.	105	305 to 307·50	6 to 8½	—	32 to 33	185 to 240	7 70 to 8 —	— 36 to 406
Nov.	104/6	320 to 330	6 to 8½	—	29	175 to 240	7 50 to 7 80	— 40 to 37/
Dec.	103	310	6 to 8½	—	30½ to 31	170 to 250	7 50 to 7 70	— 40

THE AMSTERDAM CINCHONA AUCTIONS.

(Telegram from our Correspondent.)

AMSTERDAM, Dec. 13th.

The manufacturing bark offered at today's auctions contained an aggregate of about 13½ tons sulphate of quinine, or 4·03 per cent on the average, divided as follows:—About 22 tons contain 1·2 per cent; about 64 tons contain 2·3 per cent; about 101 tons contain 3·4 per cent; about 62 tons contain 4·5 per cent; about 53 tons contain 5·6 per cent; about 20 tons contain 6·7 per cent; about 14 tons contain 7·8 per cent. The entire supply was disposed of at some decline, the unit value being: for low-grade barks, 7½ to 7¾ cents per ½ killo. (= 1¼d to 1⅜d per lb.); and for high-grade barks, 7¾ to 8 cents (= about 1⅜d per lb.). The following were the prices obtained: manufacturing baks in quill, broken quill, and chips, 7 to 63 cents (= 1¼d to 11⅓d per lb.); ditto root, 16 to 55 cents (= 3d to 10d per lb.). Druggists' barks, in quills, broken quills, and chips, 7 to 89 cents (= 1¼d to 1s 4d per lb.); ditto root bark from 9 to 37 ceuts (= 1⅝d to 6⅝d per lb) The principal buyers in the order of their purchases were the Auerbach factory, the Brunswick works, and the Amsterdam quinine works.—*Chemist and Druggist.*

CEYLON TEA AVERAGES IN LONDON FOR 1890.

As the last public sale of Ceylon tea has been held this year, we give below the results of Reutor's and Messrs. Wilson, Smithett & Co.'s weekly telegrams during the past twelve months in tabular form, with similar figures for the previous year, for the sake of effective comparison. The first thing that strikes one on comparing the two sets of figures is the wonderful uniformity which has characterized the averages this year as compared with last year. In 1889, the aver-

ages ranged from 9d to 1s 2d a range of 5d a lb. This year the figures ranged from 9¾d to 1s 0¼d, a range of only 2½d. In other words there has been exactly 50 per cent less range this year than last. Indeed, when we examine the monthly averages. we find but little change at all. The lowest was 10¼d in March and April, and the highest 11¾d in September, October, and November. The figures for monthly averages are as follows :—

MONTHLY AVERAGES DURING 1890.

January	11½d	July	10¾d
February	11¾d	August	10½d
March	10¼d	September	11¾d
April	10¼d	October	11¾d
May	10½d	November	11¾d
June	10¾d	December	11d

These figures take in conjunction with those given below, ought to be of great interest to all our up-country readers. The following are the quantities offered and sold, and the averages realized weekly in London during 1890 :—

	1889.			1890.		
	Pkgs. Offd.	Pkgs. Sold.	Wilson Smithett's Average.	Pkgs. Offd.	Pkgs. Sold.	Wilson Smithett's Average.
January						
3	4500	3800	/10¾	2000	2000	/11¾
10	9500	7200	/10¼	14000	13000	/11½
17	9100	7000	—	11000	9000	/11½
24	9900	8000	/10½	8000	7000	/11½
31	9200	7700	/10¼	13000	11000	/11¼
February						
7	9500	7000	/10¼	8000	7000	/11
14	6100	5000	/10	10000	8000	/10¾
21	5600	5000	/10¾	9000	8000	/10¾
28	9500	7800	/10¾	11000	10000	/10½
March						
7	6900	6000	/10½	11000	9000	/9¾
14	9700	7300	/10½	7000	6000	/10¼
21	6800	6000	/10¼	11000	10000	/10¼
28	7300	5000	/10½	13000	11000	/10¾
April						
4	5900	4800	/10¼	4000	4000	/10½
11	11700	8800	/10			
18	5400	4500	/10¼	16000	11000	/10¼
25	2700	2300	/10¼	6000	5100	/10½
May						
2	15750	14000	/9¾	11000	9000	/10¼
9	16500	14500	/9½	15000	11000	/10½
16	11500	8700	/9½	9000	8000	/10½
23	12750	9500	/9¼	18000	17000	/10½
30	6500	5800	/9½	5000	5000	/10
June						
6	8600	7500	/9½	23000	22000	/10½
13	8900	8000	/9½	12000	12000	/10½
20	23500	14500	/9	15000	15000	/11¼
27	13750	12000	/9	16000	14000	/11
July						
4	9700	8500	—	8000	8000	/10¾
11	12500	11000	/10	14000	13000	/10¾
18	10000	8000	/10¾	9000	8000	/10¾
25	10000	10000	/10¼	14000	12000	/10½
August						
1	15000	14000	/11½	16000	14000	/10¼
8	2000	2000	/10¾	3000	3000	/10¼
15	9000	9000	—	20000	17000	/10½
22	11000	10000	1/0½	19000	17000	/10½
29				9800	9400	/10¾
September						
5	2000	1000	1/0½	20000	17000	/11
12	8000	7000	1/1¼	7000	7000	/11¼
19	8000	8000	1/1½	10000	8000	1/
26	10000	9000	1/1¼	13000	12000	1/0¼
October						
3	9000	9000	1/1¾	15000	14000	1/
10	11000	11000	1/2	7000	7000	1/
17	8000	7000	1/2	9000	9000	—
24	4000	3000	—	9000	8000	/11¾
November						
1	7000	7000	1/1¾	8000	8000	1/
8	8000	6000	1/1¼	5000	4000	1/0¼
15	6000	3000	1/0½	6000	5000	1/
22	7000	5000	/11¾	11000	9000	/11¾
29	5000	4000	1/	10000	10000	/11
December						
6	12000	10000	/11¾	7000	7000	/11¼
13	7000	7000	/11¾	11000	12000	/11
20	9000	8000	/11¾	7000	6000	/11
Total	447250	380200		548800	488500	

—Local "Times."

LANKA PLANTATIONS CO., LD.

Below I would ask you to print the same journal's account of the meeting of the Lanka Plantations Company. In this case, as in that of the P. & O. Company above referred to, my previous letter anticipated nearly all that Sir R. P. Harding had to say to his shareholders. What fell from him, however, will not on that account be less pleasing to your readers :—

The tenth ordinary general meeting of the Lanka Plantations Company (Limited) was held on Wednesday at the offices, Old Jewry, Sir R. P. Harding presided, and in moving the adoption of the report stated that the advices which they received continued to lead them to hope and believe that the current year would certainly not be worse than the year of which they had the accounts before them. He thought that they might fairly consider that the Company had turned the corner, and every year which was added to the age of the tea trees should improve their position. They had 1,400 acres planted with tea, and probably they would soon have 1,500 acres; and if the average yield, when the trees got older, should be only 300lb. per acre, they would have 400,000lb. of made tea a year to dispose of. He had no doubt that this would give them very satisfactory dividends. Very great economy had been practised by their agents and superintendents. They were out of debt, and a debit balance of £1,458 had been discharged, They would be asked to approve the payment of the interim dividend on the preference shares, and to sanction the payment of a dividend on those shares for the second half of the year as well as the payment of a small dividend (3s a share) on the ordinary shares. He trusted that this would be the beginning of a much better state of things than they had experienced for some years. Sir Herbert B. Sandford seconded the motion. Dr. Bayford questioned the advisability of paying the small dividend suggested on the ordinary shares. For several years they had had deficits, and had accumulated a substantial debt, which he thought the credit balances shown this year should have been used in diminishing. He also advised the further planting of tea trees. The chairman, in reply, stated that the coffee which they now had was exceedingly good, and they were advised that the coffee prospects for 1890-1891 were extremely satisfactory. They had gone into tea planting as their resources permitted. They had reduced their indebtedness out of the profits and they had expended £1,900 this year in buildings and in fresh tea planting. They intended to decrease the suspense account, and not to add the capital account any further. The report was adopted and the dividends mentioned were afterwards approved.—London *Cor.*

"KEW BULLETIN."

The October number contains articles on an edible fungus from New Zealand, Hirneola polytricha, which is nearly allied to our common Jew's-ear fungus. It appears that this is in great demand in China, although the analysis, as given by Professor Church, seems to show that its nutritive qualities are feeble, and that unlike most fungi hitherto analysed, it is very deficient in albuminoids or flesh-forming matters. The preparation of Mexican or Istle fibre from Agave heteracantha, is described; the fibre being largely made use of for cheap scrubbing-brushes. The ravages of the moths known as the "Nonnen" (Liparis monacha). In the Bavarian forests, are detailed. It appears, that in Bavaria alone the loss to the forest revenue will amount for the year to something like £40,000. Okro fibre, from Hibiscus esculentus, and Coconut butter (not to be confounded with Cocoa-butter), receive attention. If this tasteless, fatty substance, can be prepared as suggested from the copra or dried Coconuts of commerce, the supply of material would be almost unlimited. Medical evidence goes to show that the fat in question meets all hygienic requirements, and is "far superior to animal fat and

butter, as well as any of their other substitutes."——The November part contains an article on the Liberian Coffee, introduced to Kew in 1872, and distributed into commerce by Mr. Bull shortly afterwards. On July 22nd 1876, p. 104, Mr. Hiern favoured us with an article on the subject, to accompany a woodcut illustration taken partly from a plant in Mr. Bull's nursery, partly from wild specimens. It was hoped that the West African Coffee would prove more robust, and better able to withstand the attacks of fungus (Hemileia). At first, however, these expectations seemed likely to be disappointed but now we learn the tide of opinion in the planting world has set in favouring the Liberian Coffee, and various extracts in support of that opinion are given in the number before us. The African Cola-nut (Cola acuminata) is the subject of the next article, which comprises a brief summary of what is known on the natural history and properties of this valuable tree. The nuts contain caffein and theobromine, and their consumption is stated, on good authority, to enable the natives to undergo great exertions with relatively little fatigue. The bitter Cola, also alluded to in the *Bulletin*, is quite a different thing. A figure of the fruit was given in the *Journal of Botany* for 1875, by Dr. Masters, and the plant was subsequently described under the name Garcinia Kola by Heckel, who had had overlooked what had been previously published. The fruits in question have a bitter taste, and are probably destitute of the special virtues of the true Cola.—*Gardeners' Chronicle*, Nov. 22nd.

TEA ON THE NEILGHERRIS

After Coffee, Tea is to the European planter the most important industry on the Neilgherries. It was introduced in the year 1835, but made little progress until after 1860. At first it had to endure the same drawbacks that planting in Assam had, *viz.*, unskilled labour for cultivation and manufacture and inexperienced supervision; on the other hand, it had some advantages, such as choice of land, cheap labour and manure, and high prices for well-manufactured produce. As manufacture improved so did demand with the usual result over production for local consumption. The excess produced was sent to the London market with variable success. Either Neilgherrie Tea did not retain its flavour in England or planters did not receive justice in that quarter, and the latter is suggested by the fact that consumers, to whom expense was a secondary consideration, and who used the better classes of Neilgherrie Teas, preferred getting them from the estate direct to using what they termed "the high-priced flavourless Tea" that they obtained from grocers in England.

As Tea keeps better in large quantities, as sent in chests to the London market, than in small boxes, as sent to private purchasers, the Neilgherrie planter is at a loss to understand why the passing of his Teas through the usual business channels should result in their being classed low and realising little more than "*dust*" of other Teas. It must be admitted that Neilgherrie Tea is not strong like Assam, and that it is not at all useful for mixing with tasteless China Teas, but it is a good high class drinkable Tea by itself; especially in India, where it keeps with care for a considerable time. The Neilgherrie planter has something yet to learn, since it appears that his Tea does not reach the English market in good condition in lead lined chests, while those of other districts do so.

A few estates have obtained high prices, such as five and ten shillings per pound, notably Brooklands and Glendale, but these prices were for fancy Teas, and did not represent the ordinary manufacture for commercial purposes. Lately Kodanad obtained high prices for a large consignment; and if this continues, it will be a new departure on the Neilgheries, and help to solve the most difficult problem the Neilgherrie planter has to deal with, and prove conclusively to the most sceptical that climate is not the drawback to the district's Teas realizing good paying prices in the London market.

When tea planting was rushed lands were planted up that should not have been. The plant being hardy grows almost anywhere, and is not easy to eradicate, the small pieces of root left after a tree is dug out often start into new trees even in poor soil. Notwithstanding its hardiness and good growth as a tree, it does not grow so fast as in warmer climates with more rainfall; so that the production is not equal to that of Assam or the favourable Ceylon districts, and it would no doubt have been abandoned ere this only that its fine flavour obtained for it a large sale in India; this, together with cheap labour and a good climate, has been in its favour, and it is probable that the demand for it in England would increase considerably if it could be supplied to consumers in as good condition as it is to the consumers in India. It may be that the passage of Neilgherrie tea through the Customs Department, when it is turned out to be weighed and bulked, and handled in a very different way to what it is in the factory, is too much for its delicate flavour, but which the stronger Assams, Ceylons, and Travancores can probably stand. This seems to be the point where combination among planters may turn a poorly paying industry into a highly remunerative one.

The Tea produced in Southern India is not enough to appreciably affect the general prices in England. The imports of China Tea into England have fallen considerably, but have been amply replaced by increased supplies from India and Ceylon, in both of which countries there is land yet available, and more than enough to produce any demand that may be made from England. The annual increase in supply is quite equal to the increase in consumption as well as to the deficiency in supply from China: so that the prospects of a general rise in prices are not promising for the industry. Great efforts are being made to introduce Indian and Ceylon Teas into America and Russia, but satisfactory efforts are not being made to increase consumption in India. Consumption is increasing amongst the natives slowly but surely, and if it amounted to half a pound per head at the present rate of production, not a pound of tea would be available for England, where consumption is about $5\frac{1}{2}$ lb. per head of population. It will require a very small consumption per head in India to absorb all the increase that takes place annually. A trial is at present being made in Bengal. Perhaps a scheme something like the following might be more successful. Every estate in India to supply to a syndicate at least one per cent. of its produce (will aggregate about 1,000,000lb.) at cost price, or a little under it, say, an average tea for As. 5 per lb. delivered in the consuming district; the syndicate to add on 20 per cent. to cover expenses and profit, and to pay for the Tea supplied at the end of the year. For this consideration the syndicate to undertake to distribute the teas over the whole country, but in such manner as will not interfere with present important tea dealers, and in, or convenient to every hospital at the prices fixed, say, As. 3 per half lb. packet and As. 1-6 per quarter lb. packet. The teas to be supplied in such packets and properly labelled by the estates with full directions in the vernaculars for preparing the beverage.

No estate can lose much by such a scheme, while it may result in a very large increase in consumption of tea and a reduced consumption of alcohol. It should not be impossible to induce the women of India to indulge in tea who have no national beverage.—*Indian Planters' Gazette.*

SALE OF CEYLON TOBACCO IN LONDON.—Messrs. Grant, Chambers & Co. sold by auction on 11th Dec. 1890, 148 bales Ceylon leaf tobacco, mark N.K., all of which realized 4d per lb.

TOBACCO-GROWING IN GERMANY.—Last year's crop of tobacco in Germany has proved so remunerative that the extent of land under this plant has been increased by upwards of 100,000 acres.—*E. Mail.*

CEYLON GEMMING COMPANIES.

It would seem as if there must have been a very strong divergence of opinion expressed in the Reports of the two experts who were sent from home to examine into the question of Gemming in Ceylon. Every endeavour has been made to keep the nature of these Reports from becoming public, and to a great extent this effort has been successful, for we are without the details of what has been written either by Mr. Barrington Brown or by Mr. Fahey.

As regards the gentleman first mentioned it seems to be certain that he regards the prospect before systematic Gemming in Ceylon to be satisfactory, he having been overheard to express that opinion to Sir Arthur Havelock at the meeting held in London to represent to our then new Governor, the views of those interested in this matter on the Gemming Ordinance passed by Sir Arthur Gordon shortly before his departure. But if the information which had reached our London correspondent may be fully relied upon, Mr. Fahey did not adopt so favourable a view, and the result is that those who sent him out to Ceylon have decided that it is not worth their while to incur further expenditure and have wound up the Syndicate formed to undertake preliminary investigation. In the absence of more authoritative information we must accept the matter as standing in this position. We cannot, of course, argue upon what Mr. Fahey may have reported consequent upon the very simple fact that we are without knowledge of the reasons which determined him upon making a report of the character he appears to have done. We may accept the statement that his Syndicate has closed its venture, as conclusive proof that the expert it employed has expressed an opinion adverse to further attempts by it. We should have much liked to know upon what the different views expressed by the two experts were based. We are told that Mr. Fahey, while admitting the existence of a large number of gems in Ceylon, did not think that the cost of systematic search for them could be repaid, to the extent, at all events, of leaving a margin for profit.

Mr. Barrington Brown, as we have said, is strongly of a contrary opinion. How far he may have reached such a conclusion upon the possible collateral profit to be obtained during the search for other minerals, such for instance as plumbago and mica, we cannot of course say. Little has been done as yet in the way of the importation of machinery for developing the mines formerly existent of the first mentioned of these minerals by the Company working on the Everton and other contiguous estates, but we have been told that time has not sufficed for this. Everything, however, now seems to promise that those who have invested capital in the first actual Gemming Company started will not have done so without profit. The question as it seems to ourselves to stand between the two experts is as to whether the search for gems *per se* can be made to pay, whether that can be attained without the collateral aid to be obtained from the development of other mineral resources possessed by us. While this question remains unanswered, we must be left wholly in doubt as to how far the expert opinions obtained on the prospects of gemming alone are antagonistic to each other, or as to how far they may run on parallel lines. One thing only is certain—that while those who employed Mr. Fahey have abandoned their project, the gentlemen who sent out Mr. Barrington Brown are still hopeful of future success. We suppose there can be no doubt that the latter expert carries more authority by virtue of special and varied experience. However, it seems probable now, that until full recovery has been made from the financial crisis which has lately overshadowed the London money market, we shall have to wait in our present condition of uncertainty. Much will doubtless depend upon the further success which may be achieved by the Gemming Company now at work. Of profitable returns, it has already secured a certain measure. Whether this will prove sufficient to warrant further investment in Gemming in Ceylon is more than can at present be said. When that Company issues its first Report, we may be in a position to write more certainly of the prospect before us; but at the present time we must hold our judgment in suspense.

TEA LEAD-PAPER.

We call attention to Mr. T. C. Anderson's letter respecting "Clark's Patent Paper Tea Lead" in answer to our remarks of the other day. We had forgotten how many testimonials to its good quality, Clark's patent paper lead had secured. In a private note Mr. Anderson says:—

"I have seen Mr. Seale of Messrs. Somerville & Co., and he says he has never heard of any unfavourable report on the paper lead, and that he uses it for samples. I regret that planters won't give it a fair trial. *I* do not want to make money out of it, unless it is universally adopted: and anyone may use it provided they use good lead and not ruin the thing by using perforated cheap lead."

In this connection and in regard to several other patents of value to tea planters, would it not be well to form a standing sub-Committee of the Planters' Association for 1891-92, to consider and examine all improved or economical means of cultivating, preparing and shipping tea that might be laid before them. It might be called "The Tea Improvements Committee." Many individual planters cannot afford the time to examine, or fear the risk attaching to, some new and perhaps good thing. Now a report by a disinterested, impartial Committee could not fail to be exceedingly useful as a guide all round.

CEYLON TEA FOR RUSSIA.

A PERMANENT RUSSIAN COMMERCIAL AGENCY IN COLOMBO.

The following translation of an editorial in a leading Russian paper will be read with interest:—

(From the *Novoe Vremya*, Dec. 1st.)

We recently wrote about the development of tea plantations in British India and Ceylon, which we ought to work to our own advantage and the disadvantage of China. We now find a very interesting paragraph in the St. Petersburg *Vedomosti* in connection with that subject. That paper says: "The enormous sums of money which we yearly pay for tea to the China merchants and the London tea brokers, could be profitably spent in arranging to keep up regular communication by our steamers between Russia and Ceylon. The business relations with China are getting each year more and more difficult, as the China men have quite adopted all the ways of usual business speculation, viz., as soon as the so-called tea season begins they all form a sort of confederation buying up all the new teas coming from the hills, increasing at the same time the prices for second qualities and condemned teas, which were not sold the last year. The European Agents getting uneasy about the non-appearance of high quality and new teas in the markets of Foochow, Hankow and Shanghai are easily caught in that trap and buy for high prices condemned or adulterated teas,

believing the assurances of the Chinamen that there are no superior qualities this season to be got. After having sold these lots, the good and new qualities begin to appear in the markets. By these or other tricks the Chinamen almost always succeed in deceiving the European buyers, who have more orders on hand than is possible to execute in a most limited time, and yearly those orders increase in proportion to the fast increasing number of tea-drinkers all over the world.

All this, says the *Vedomosti*, leads us to think seriously of opening new tea markets; and Ceylon appears the most convenient, for all of us drink now already unawares as much Ceylon as China tea, as our London brokers and agents use Ceylon tea most freely, almost half and half, for mixing up all the teas via London for Russia.

Further we must take into consideration that Ceylon may serve also as a market for some of our products. At a Conference which took place recently at the Ministry of Commerce the whole subject (here noticed) was duly talked over, and the Ministry of Commerce came to a resolution to open and confirm in Colombo a permanent commercial agency.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.)*

LONDON, Dec. 11th.

ANNATTO.—For 50 bags good red seed from Ceylon 2½d per lb was refused. Twelve baskets Pará roll annatto were offered; they were of fresh import, but the quality was common and mouldy. After some bidding 9d per lb was realised for the lot.

COCA LEAVES.—The only lots shown in today's sales were 2 packages Ceylon leaves, good bold dark Huanoco character, undamaged, which sold for 5½d, and 9 packages Java leaves, very small, badly cured, brown and mouldy which were bought in at 6d per lb for the best.

ESSENTIAL OILS.—Two cases fair bright yellow Cinnamon oil realised 1s 4d per oz.; and 17 bottles cataloged as "cinnamon oil," sold without reserve for 3d per oz. For 50 cases Citronella oil in tins, ⅝d per oz is asked, but there were no bids.

CEYLON PRODUCE IN RUSSIA.

The following letter addressed to our London Agents, and sent us to deal with, carries its own explanation, and we trust that Mr. Mandel will hear from Colombo merchants with the quotation he asks for: "Orel, Nov. 8th, 1890.—We are indebted for your address to a correspondent of ours and request you kindly to make us offers for Ceylon coconut oil, original tare, delivered at Riga. Kindly send me also samples of tea in ½ and ¼ chests. I have a considerable sale for the above mentioned articles and should be pleased to give you orders should your prices allow me to do so. Hoping to hear from you soon, I remain, Abraham Mandel."

NOTES ON PRODUCE AND FINANCE.

FRAUDULENT TEA MARKS.—Public attention is frequently directed in the Press to the frauds committed in the preparation of tea and the disregard of the Merchandise Marks Act. The *Echo* records the result of an interview with the manager of a leading company which imports and sells the tea from its own gardens. We were shown, says the writer, a row of twenty-seven packages of socalled "pure Ceylon tea," on the labels of which some qualifying words were printed in a far smaller type. It is the poor who chiefly suffer. They are induced to buy dust and sweepings of inferior China tea, mixed with the dust and sweepings of Indian Congou as pure Ceylon tea "blended with choice Indian and China growths." This last sentence is upon most of the labels printed in very small letters, or else at the end of the packet so designed as to mislead the purchaser, while affecting to conform to the letter of the law. Those who wish to lend their support to British-grown tea might look carefully into these packets and see for themselves what wretched subterfuges are resorted to cheat both the Indian producer and the English consumer. No one is inclined to take up the cudgels for the poor, out of whom a far larger profit is made than that obtained from the well-to-do and educated classes, who know the right quarters to go to. Much the same, in fact, is being done by unprincipled advertisers in the tea market, as by touting brokers in stocks and share. False descriptions and misrepresentations, added to unfairly large profits, will generally carry the day. Government appears powerless to stop the gambling in the one case and the cheating in the other, although both the "bucket-shop" keeper and the preparer of false labels not only err against the spirit but also break the letter of the law.

A TEA RESTORING MACHINE.—The question how to preserve the staying power of Indian and Ceylon teas has for years exorcised the minds of planters, brokers, and dealers. The constant cry in the "Lane" has been, "Give us tea which will not 'go off.'" We are glad to learn that Mr. J. D. Cahill, of Sea View, Sandycone, Dublin, a tea planter of experience, has lately patented a process and a machine for not only restoring tea which has "gone off" to its original freshness and briskness, but one which he claims will also materially improve tea which has been badly cured, or which is of inferior quality. We understand plans of the machine are already in the hands of the makers, and we hope shortly to be able to publish a full description of it. We hope that the desirable results claimed by Mr. Cahill may be fully maintained.

PREPARED COCOA.

A leading scientific journal specially devoted to chemical and analytical matters recently gave a short article upon the above subject, in which it was pointed out that cocoa is highly stimulating, but rich and somewhat indigestible, containing a large amount of fat known as cacao butter. To prepare cocoa for the table it is necessary that the amount of this fat should be reduced. This is attained by using one of two methods, namely—(1) the roasted and ground cocoa is mixed with starch and sugar so as to dilute its richness; (2) before grinding the cocoa it is heated and pressed, whereby a considerable amount (generally nearly one-half) of its natural fat is squeezed out. This latter method is decidedly the more desirable one, because not only is the fat removed, but all the other nourishing and stimulating principles are at the same time concentrated. A typical cocoa of English manufacture, which has always been constant in its nature, was recently found to possess the following percentage composition:—Fat=28·12, theobromine=0·95, natural starch, sugar, fibre, &c., =40·85, soluble albuminoids=6·61, insoluble albuminoids=14·73 (these are the total flesh-formers=21·34), natural mineral matter=4·94, moisture=3·80: total=100·00. To give a still more striking confirmation of these figures let our readers glance at the following average amounts of flesh-forming ingredients present in the substances named:—Natural cocoa, 13·00 per cent; good wheaten flour, 14·00 per cent; cocoa prepared with added starch and sugar, 6·00 per cent; cocoa prepared by extraction of fat, 21·00 per cent.—*Grocer.*

CINCHONA BARK.

(From *C. M. & C. Woodhouse's Report.)*

LONDON, Dec. 18th.

The market during the past month has continued quiet. The Dutch sale held on 13th instant, at Amsterdam, estimated to contain an aggregate of about 13½ tons sulphate quinine or 4·03 per cent. on the average, sold at easier rates, the unit being quoted 1⅛d to 1¼d. In London, however, at the auctions held this week, the value

of the unit was fully 1½d, possibly owing in some measures to orders being in the market to buy for speculation. During the past few weeks, meetings of the principal manufacturers of quinine have been held with a view of forming a combination to regulate the price of quinine. The representatives have, however, separated without arriving at any definite understanding. Only small transactions are reported in quinine, the latest sales being at 11⅜d to 11⅝d for German on the spot, and 12¼d for arrival. The Amsterdam public sales of bark, are fixed for the following date next year, viz., 22nd January; 26th February; 2nd April; 14th May; 11th June; 16th July; 3rd September; 8th October; 12th November; 17th December.

COFFEE AND TEA FIGURES CONSIDERED.

TEA: HOME CONSUMPTION.

Ending October 1890, five months.			Then at this rate 12 months 1890-1891 would show as follows.
Indian	... 41,016,071	.. equal to	98,438,570 lb.
Ceylon	... 17,542,380		42,101,712
China, &c.	... 24,938,790	"	59,853,096
	83,497,241	"	200,393,378 lb.

Take G. W., & S.'s next Circular of 21st Nov. 1890 re Tea exported from United Kingdom for 10 months ending 31st Oct. 1890 and the figures for 12 months at the rate indicated would be.			Say H. C. and export, 12 months.
Indian	... 2,359,629	... equal to	100,798,199 lb.
Ceylon	... 1,328,461	"	43,430,173
China, &c.	...31,643,916	"	91,497,012
	35,332,006	"	235,725,384 lb.

Since compiling the above, G., W. & S.'s figures are to hand in gross, for H. C. and export for 6 months ending November: they are:—

Indian ...	...	50,081,487 lb.
Ceylon...	...	22,102,654
China, &c.	...	44,719,286
Java ...	...	2,098,250
		119,001,677 lb.

being in excess of the above estimate and showing a still further advance in the rate of deliveries for Ceylon tea.

With a reduced crop estimate from India (Rucker & Bencraft in a late circular suppose they will receive in London from India 106,000,000; Ceylon 50,000,000, supposition of mine; China 63,000,000,* your Hongkong correspondent's figures—he says it is his estimate for "the whole year"—say 25 per cent less than United Kingdom required last year), U. K. receipts will probably not exceed 220,000,000 lb. against a possible 240,000,000 lb. required, unless the export from the United Kingdom of China tea further shrinks, as it probably will do. No allowance is made here for a very possible increase in the exports of India and Ceylon tea from the United Kingdom.

COFFEE.

British tea planters are apt to leave unstudied the position of their great Rival Coffee in Europe and America—here are some figures showing the gigantic preponderance of coffee over tea in the principal consuming markets of the world.

Rucker & Bencraft in their Circular dated 6th Nov. 1890 (see *Observer* 1st Dec. '90) state that in March 1890, the deliveries in Europe and America were 62,000 tons (*i. e.* 138,880,000 lb.) which "nearly coincides," they say, "with the total stocks in the TWO CONTINENTS" on 6th Nov. 1890.

James Cook & Co. in their Circular dated 22nd Oct. 1890. (See *Observer* 17th Nov. 1890) give total deliveries for 9 months ending Sept. 1890 at

in Europe ...	309,000 tons	
" America...	159,500 "	
Total..	468,500 "	for 9 months

or at the rate of 624,666 tons for 12 "
i.e.—1,400,000,000 lb. or about 115 million lb. *monthly*

Strange to say J. Cook & Sons give stocks IN EUROPE, on 1st Oct. 1890 at about 60,000 tons—so one of these firms has fallen into an ERROR.

Rucker & Bencraft in their circular of Oct. 9th (see *Ceylon Observer* 30th Oct. 1890) give stocks on 1st Oct. "in Europe" 61,200 tons. In same Circular they say, the "deliveries (Europe and America) have been nominal—about 50,000 tons for the month"—large crops and ever increasing consumption. As far as I remember 8,000,000 bags* is the estimate of the coming Brazil crop, but even if it is on the trees will it ever be picked with labor only just made free? The Brazil planters evidently funk it and were getting some thousands of Chinese to help them, but did not late Rio News inform us that the Rio Government forbid their being landed and in fact ordered the ships with the Chinese on board to leave their shores.

Messrs. Jas. Cook & Co. in their circular of Sept. 24th, 1890 (see *Ceylon Observer*, 21st Oct. 1890) say "the deliveries (Europe and America) for consumption during the 8 months of this year are very good being 10,000 tons above last year, and nearly 17,000 tons in excess of those for 1888—the figures for the United Kingdom, however, are not so encouraging owing to adulteration." The Grand Old Man is mainly responsible for this. He surrendered at discretion, and the grocers carried *their right* to continue to poison the English working people!—His grand demonstration about pure coffee and tea was—PURE HUMBUG.

P. S.—I see the new Directory gives a comparison of lb. of coffee and lb. of tea. Your estimated consumption of coffee on Continent of Europe was 405,000 tons, a very close estimate indeed, looking at the actual figures above.

To open freely new tea acreages in India and Ceylon until new markets are more assured of, and China competition can safely be despised, would seem to involve some risk at present, cheap coffee *must* be reckoned with

* Japan too included here I believe.

* R. & B. in their last circular, published in the *Observer* of 24th Dec., say 8 to 9 million bags—involving a probable certain export to Europe and America of 7 million bags of 132 lb. each—truly a "bumper" crop.

COFFEE NEWS.

The coffee crop in Hayti this year is reported very large. The *Rio News* says that, generally good news from coffee producing countries this year promises to cause much lower prices for the next year or two.—*American Grocer*, Nov. 12th.

TOBACCO CULTURE PROHIBITED.—The Khedive of Egypt, on June 25th, 1890, issued a decree prohibiting the cultivation of tobacco throughout Egypt, and lands hereafter found to be under such cultivation will be subject to a fine equaling $1,000 per acre.—*American Grocer*, Nov. 12th.

THE KRYOLITE TRADE.—A revival seems to have taken place in the Kryolite trade, the Company which own the quarries at Ivigtut, Greenland, having found a new market for it in Russia. For some time the manufacture of products has been falling off and the Company had disposed of most of their vessels which traded with Copenhagen. Keeping up the supply, however, to Philadelphia where there are also manufactories. The result of the recent revival of the trade has been the re-employment of the Traveller (Captain Alexander Simpson,) of Peterhead, to carry two cargoes to Copenhagen next year, and to take out a cargo of coals. It is six years since this vessel was similary employed.—*A. F. Press.*

THE MADRAS AGRICULTURAL OUTLOOK.

A few districts in the Presidency are passing through a grave crisis at the present moment, and much necessarily depends on the state of the weather during the next fortnight, or three weeks. In parts of North Arcot, Chingleput, South Arcot and Tinnevelly crops over considerable areas will be lost unless there is an early fall of rain, and Government is already so far anxious as to think it necessary to call for special reports. As we remarked on the 26th ultimo, the distress is partial and local, and the rainfall average for the whole of a district is no indication of the true state of affairs in different portions of it. For instance, from the rainfall statement for October, just issued by the Board of Revenue, we observe that so far as regards the Districts mentioned above, in North Arcot the rainfall up to the end of that month was equal to the average of five years ending 1888-89; in South Arcot it was only three inches below the average; in Chingleput nine inches; and in Tinnevelly five inches. The greatest deficiency for a whole district was in Malabar, where it amounted to nineteen inches, while in Madras it amounted to twelve inches. The season has also been unfavourable in the Cumbum taluk of Kurnool, where paddy, ragi, and arika are suffering from want of rain. In Cuddapah the paddy is withering in the Badvel taluk, and the ragi in Madanapalle taluk. In Coimbatore the wet crops of Palladam, and the dry crops in parts of Coimbatore, Erode, Udamalpet, Palladam, Pollachi, Srtymangalam and Kollegal, are being spoilt by the drought, and the same is the case in the Uttaukarai taluk of the Salem district. Altogether there appears to be cause for disquitude over considerable areas of the Presidency. If within the next few weeks the rainfall is not more general ia considerable amount of distress will, we fear, ensue.—*M. Mail*, Dec. 11th.

ANALYSES OF TEA SOILS, MANURES, &c.

In quoting the following details from the proceedings of the A. and H. Society of India we would suggest that our Ceylon planters might avail themselves of the opportunity to have tea soils, &c., analysed:—

Mr. Francis Y. Ede, of Silchar, Cachar, wrote as follows:—I notice in the Journal of the above Society. Vol. VIII, Part IV, N.S., a memorandum on the analyses of Tea plants, Soils, &c. During the last ten years I have had occasion to draw some hundreds of samples of soil, analyse and report on the same with reference to their suitability for Tea gardens, their probable yield, etc. I have taken numerous samples from all the different kinds of land in Assam, Cachar and Sylhet and have kept, where available, a record of the amount of tea yielded by these soils and the condition under which the yield was obtained. If you think it would interest the subscribers to your journal, I could send you a few notes and memoranda on soils, their treatment, &c., in the tea districts.

Mr. Ede's offer was accepted with the Society's best thanks, and it is hoped that his good example will be followed by the many experienced Planters who are in a position to throw much light on many of the problems both in the culture and manufacture of tea which still remain unsolved. In a subsequent communication Mr. Ede wrote:—"I have to thank you for your letter of October 11th, and I quite agree with you as to the necessity of collecting and printing all information available with regard to the culture of the tea plant. It has been my opinion, for many years, that the application of a little science or technical knowledge would greatly benefit the tea industry. I have been working in a small way on those lines myself, and have been often astonished to find the good results produced; in some instances I have succeeded in doubling the yield of the plant. I am very glad that such a well known and much appreciated Society should take this matter up; there is plenty of scope, and I have no doubt there will be numbers of men who will voluntarily aid in the investigation. I for one shall be most happy to render any assistance in my power. It remains for your Society to determine the best method of carrying out these investigations and compiling and recording the information it may obtain from the various districts, in such a manner that it may remain as a permanent record for the benefit of all interested. This investigation must be carried out with thoroughness and exactitude in all the tea districts, only absolute facts and reliable observations being recorded. I should be happy to let you have my views on the way in which district investigations should be carried out."

Since the receipt of the foregoing letter from Mr. Ede, Mr. Bamber has arrived in the country. This gentleman has been engaged by the Society, in conjunction with the Indian Tea Association, to conduct the inquiries relating to Tea soils, Manures and Tea manufacture as sketched in the Memorandum published in the last number of the Society's Journal (Vol. VIII. Part IV.). Mr. Bamber holds the Diploma and Gold Medal of the Royal Agricultural College of which he has also been elected a Life Member. In addition to the original research, which it is proposed to conduct, it is hoped that much valuable information will be obtained from gentlemen like Mr. Ede, and that the collating and tabulating of such information will add much to the present knowledge of many obscure points connected with the production of Tea.

The control of the inquiries is vested in a committee nominated by the Indian Association and the Society and which consists of the following genetlemen:—Chairman, Mr. C. B. Garrett. Members, Messrs. J. N. Stuart, W. O. Bell Irving D. Cruickshank, Drs. Warden and King. Secretary, Mr. R. Blechynden.

An inquiry was received from Messrs. Mc Dougall Clark & Co., for books dealing with analyses of tea soils. They were informed that some analyses had been published in the *Tropical Agriculturist* and in other papers, but as they referred to to individual gardens, they were not enough to generalize upon; and the action now being taken was alluded to.

PLANTING AND SHOOTING IN PEERMAAD.

The South-West monsoon has been, as I prophesied it would be, one of the lightest on record, and though the North-East, with its attendant cyclone, did its level best to make up for any shortcomings on the part of its elder brother, the total rainfall up to the end of last month only amounts to 104·80 inches; out average being about double this amount. To both coffee and tea, the mildness of the monsoon has been favourable; to the former especially so and—if I had one—I would bet my bottom dollar, that a few successive years of mild monsoons, would effect a radical change for the better in the productiveness of the coffee estates in this district. The season's crop, which is now being gathered, is, with one or two exceptions, decidedly short, owing chiefly to the high winds and storms that prevailed during the blossoming season, but the general appearance of the estates is satisfactory, and the outlook for next year decidedly promising. An instance of the wonderful effect produced on shuck coffee by the judicious planting of belts is worth recording. One of the oldest properties up here, planted early in the "Sixties," was some years ago well-nigh played out; crops had become beautifully less, and the proprietor's heart was sad within him; a happy thought, however, struck him to try belts, and he promptly set to work, and planted up rows of *Grevillea Robusta* over a large portion of the estate. These have now grown into fine trees, and the effect on the coffee has been simply marvellous. It seems to have taken quite a new lease of life, and though, doubtless, the shelter and partial shade afforded by the belts has been highly beneficial, there can be no possible doubt that there is *something* in the *Grevillea* that acts on coffee as a most

wonderful tonic. With the gloomy accounts one hears from various coffee districts, it is cheering to have to record the fact that some new clearings for "Coffea Arabica" are to be opened up during the coming season, thus proving that in spite of past years of leaf disease and short crops, there are some, at any rate, who have not lost their faith in the old King—"So mote it be." The steady increase in the yield of tea, and the good averages obtained are highly satisfactory. Further experiments in the manufacture of green teas have resulted in further successes; but as these have already been chronicled in the columns of the *Madras Times*, I need not here further allude to them.

* * *

Our local shikarries have not done very much in the way of shooting lately; but two visitors from Ceylon had very fair sport during a short stay of about three weeks, and succeded in bagging a couple of tuskers, a few bison, sambur and ibex and a leopard.

P. S.—Since writing the above, there has been an extraordinary change in the weather, which can only be accounted for by some peculiar atmospherical disturbances in your part of the world; and which to have reached us must have been, I imagine, somewhat severe. The land wind has suddenly stopped, and we have had very heavy showers, accompanied by thunder and lightning most unheard of occurrences at this season of the year,—*Madras Times*, Dec 17th.

PLANTING IN WEST BORNEO.

Sir,—The tobacco planters now in Sambas seem to pin their faith to the low alluvial land along the lower reaches of the Sambas River, and none of them seem inclined to give the Sanggauw district another trial, which, I think, is a pity as there can be no comparison between the two soils—that of the lower land consisting of from 6 inches to a foot of humus on the top of a rather stiff subsoil, whereas in Sanggauw you have a rich chocolate colored soil of great depth and of volcanic origin, there being the crater of an extinct volcano close to the Simadrem Estate. Given a fairly dry season, and clearing on land less shut in and at a lower elevation (and there is any quantity of such land in the district) and I cannot but think that a finer quality of tobacco would be produced at only a slightly decreased yield.

There are several contracts held in Sanggauw district, and one gentleman has a very successful pepper clearing near the Sanggauw Kampong, at an elevation of about 500 feet, and pepper and Liberian coffee have been also planted at "Sakong" near the foot of Gunong Baiang at about the same elevation, and I am told both are doing well.

Liberian Coffee grows well in this soil, and crops abundanty, although, when planted by the Sultan, it had little care taken of it, and I have never seen finer pepper of the same age than that growing in many of the native gardens in and about Sanggauw.

The climate also is delightful; and I may here mention that the healthiness of Sambas is one of its greatest recommendations to planters and miners—in fact the death-rate for the whole of Western Borneo is very low.

One thing in connection with the planting enterprize in Dutch Borneo surprises me, and that is that the tobacco experts have confined themselves to Sambas territory in selecting land, while only 100 miles further south in the Pontianak and other districts there are hundreds of thousands of acres of equally good land along the Kapoeas River, and if anything more favorably situated with regard to transport and communication, there being three steamers running regularly between Pontianak and Singapore, a run of about 38 hours, while there are besides several large launches running up and down the Kapoeas river, which is navigable by fair-sized steamers for between 300 and 400 miles from the mouth.

The climate as far as I know, is the same as Sambas. If, as I hope, tobacco planting proves a success in Sambas, we will see all the land referred to above taken up; and I consider there is a great future for this part of Borneo in planting alone, to say nothing of the mining industry, which for the present attracts more attention than the planting. Next week I will send you a few notes on the mining concessions.—Yours &c.,

KAMBAR.

West Coast, Dutch Borneo, Nov, 1st, 1890.

—"Times of Ceylon."

Several experiments have this season been made in Virginia in growing teosinte the new southern forage plant. It is said that one grower has exhibited a bunch of teosinte which was very promising. According to a report it was "about 7 feet in height and has some 30 or 40 stalks all from one grain of seed." The producer calls it the greatest fodder plant he ever saw, and alleges that he has fed two milch cows through the summer from less than half an acre; and has still a quantity left.—*Indian Agriculturist.*

An Enormous Tree.—A correspondent of the *Scotsman* writes:—There are at present ten skilled workmen busily engaged taking out a section of an enormous redwood tree in the Mammoth Forest, California. The section to be taken out will be 9 feet in height, and will be divided into three cuts. The tree, which grows 6,325 feet above sea level, measurss 99 feet in circumference and nearly 33 feet in diameter. The saw used in getting out the section is 22 fest long, and requires eight men to handle it. Two months will bs nseded to complete the work. The sectiont are to be shown at the great World's Fair as Chicago in 1893. Three flat cars will be necessart to transport them, as their total weight will noy bs less than 20 tons.

Artificial Coffee Berries.—The art of adulteration has made further progress. Many persons buy coffee whole, thinking that by grinding the berries themselves they avoid all risk of adulteration. It is so easy to mix with ground coffee chicory or other less inoffensive ingredients. M. Ludovic Jammes, inspector, reports, however, in the last issue of the *Revue d' Hygiène,* that a number of commercial travellers are offering retail grocers coffee berries at a price which yields 60 to 100 per cent more than the usual profit. Good coffee is at present very dear, and when the tradesman expresses his surprise, the commercial travellers, so as to cover their legal responsibility, explain that the berries are artificially manufactured, and to avoid detection should be mixed with real coffee. M. Jammes gives, however, minute details to facilitate the detection of this fraud. The slit in the false berry is neither so long nor so deep as in the real berry. The colour is well imitated, but the false berry does not feel so smooth; it is also much harder, cannot be so readily broken with the teeth, and is often hollow inside. A real coffee berry can be easily broken by introducing the nail in the slit, while the false coffee will resist very hard pressure. The false coffee has a somewhat faint and nauseating taste. It seems to be composed of vegetable glands and the flour of some cereal. A paste is made with some such mixture, placed in a mould, and torrefied. The fraud is therefore absolute; the berry does not contain even the smallest percentage of coffee. It is to be hoped that these revelations will put an end to this fraudulent trade, otherwise the French will soon lose the reputation they have so justly won of being the best coffee-makers in the world.—*Lancet.*

A HOLIDAY TRIP TO LABUGAMA LAKE:

THE SOURCE OF THE COLOMBO WATER SUPPLY.

WITH NOTES ON THE VEGETATION AND PLANTING OPERATIONS OF THE NEIGHBOURHOOD.

It is to be regretted that the beautiful scene whence the capital of Ceylon derives its supply of mountain-born water (of a purity unexcelled) is not more facile of access. The Lake which has been formed by damming up the Wakoya (the "crooked stream," as the Dikoya is the "long river") is nearly 28½ miles from Colombo. Over 19½ of those are along the Ratnapura road, to about 1½ mile beyond Hanwella, and to this point the mail coach is available. But there are no horse carriages to be hired at Hanwella, only bullock hackeries to do the 8¾ miles of road which were made specially for the purposes of the waterworks. This road turns off at right angles from the high road at Wakoya, 1·54 mile beyond Hanwella. If, as in our case, a party of four can be made up, we can testify to the comfort of the waggon and the excellence of the horses which Messrs. A. Pate & Son can supply. Starting from Colombo on the morning of the 2nd at about half-past 6, we reached Hanwella at 9, and we could have got to Labugama by half-past 10, and returned the same day to Colombo, had we not formed other plans. We must warn any inclined to make the trip, that, although they may find accommodation at Labugama, in a Government building which is used as a resthouse, when not required for purely Government purposes, they had better take provisions with them from Colombo, if they do not follow our example and breakfast at the very nice and commodious resthouse at Hanwella. Even so, information ought to be sent in advance to the resthouse-keeper. With such an arrangement, visitors to the Lake could return to a late tiffin at Hanwella, and then back to Colombo. If they arrange, as we did, to dine and sleep at Hanwella, the enjoyment of the trip will not be marred by fatigue,—the more especially if our example be further followed in floating down the Kelani ("pleasant") river by boat. The resthouse-keeper could get a boat ready; and if there was any difficulty we have no doubt that other Europeans would benefit as we did by the courtesy of Mr. Ameresekere, a most intelligent Sinhalese gentleman, who is a planter and contractor for cutting, carrying and storing timber at Hanwella from the Government forest reserves, of which one block near Labugama extends to an area of 5,000 acres. I may as well mention here that although "wa" is by the Railway Department classed highest amongst firewoods, Mr. Ameresekere agrees with Col. Clarke that this tree is too valuable as a cabinet wood to be used for the furnace, for which purpose he gives the preference to "mendora," the calorific qualities of which are increased by the resin which permeates the fibres of the wood.

We should have got to Hanwella at ½ past 8, but for the fact that our driver, instead of taking the short cut, via Urugodawatta to Ambatale, took us the old route by Grand Pass and then along the road parallel with the Kelani, which crosses the canal near the Bridge of Boats. We were, in the end, glad that this route was chosen, as we thus had the opportunity of appreciating the magnitude of the raft and boat traffic on the river, in bamboos, timber trees, fire wood, coconuts (which fruits in the husk we saw floated down on rafts), bricks, tiles, &c., of which there are well stocked depots along the sides of the canal and road. We could not help noticing, as competing even with salt fish in appeals to our olfactory nerves, the odour of timber in course of conversion after being seasoned in water. The sourness of the timber smell was a striking contrast to the strong and occasionally semi-putrid odour of the fish. The value to Colombo of the cheap water carriage for fuel, timber and building materials generally, afforded by the Ke'ani, is far greater than many of us imagine. The bricks and tiles are manufactured mainly at Pannebakkery (*Anglice*, the Pan Bakery), where excellent clay for the purpose abounds under a surface stratum, more or less thick, of red mould. Here the Government had an establishment for the manufacture of bricks and tiles, so long ago as 1837; and one of the first incidents of my career in Ceylon was a visit to this place, then under the charge of a Corporal Ross of the 78th Highlanders, who had been left behind when his Regiment was removed from Ceylon. My recollection is still vivid of the huge elephants being compelled to use their broad feet in puddling the clay, their constant efforts being to step into the hollows previously made while the object of the driver was to compel them to put down their feet where the soft and adhesive clay was thickest, against which they occasionally entered protesting growls. The huge bulk of the animals' bodies and the resemblance of their long thick legs to cast iron columns made a strong impression on my mind which time has not effaced. All the way from Pannebakkery to Hanwella, good quality tenacious clay unmixed with siliceous particles, is found at intervals, on which diggers were at work. We were puzzled to see masses of puddled clay near the cottages on the roadside all the way to Hanwella until enlightened by Mr. Gibson at Labugama on an important point in engineering, of which I am ashamed to say I was previously ignorant. It appears that clay subjected only to a process of puddling and then used in building a bund is valueless, because liable to be washed away. The moist mass requires to be "weathered": reduced to dry particles. These are again moistened before being utilized, and thenceforward the mass, having dried and hardened, is as impervious as rock. One of the circumstances which added largely to the cost of the bund of the Labugama Lake, was the fact that the puddled clay used in its construction had to be transported all the way from Hanwella by carts, all attempts to find suitable material nearer at hand having failed,—sharp, sandy particles intermixed rendering the clays unsuitable. Before reaching Pannebakkery, we were interested in identifying, a little up the western bank of the river from the Bridge of Boats, the site of Orta Seda, or Sedawatta, where formerly there were botanical gardens, in which mulberry trees for the feeding of silkworms were grown. And this reminds me of the wrong spelling of Embulwatta, a village about 3½ miles on the Colombo side of Hanwella. The place has undoubtedly derived its name from the gigantic scarlet-blossomed cotton trees, conspicuous on the road and which serve to mark the divisions of korales. The name, therefore, ought to be written and printed Imbulwatta. Passsing the outlet of the Mulleriyawa tank, before reaching Kaduwela, we regretted that the time at our disposal did not permit of a visit to one of the few important irrigation works in the Western Province and one which is within easy reach of the capital. There is a nice resthouse at Kaduwela, prettily situated on a rise in the river bank and commanding a view of a great rock which juts out into the river from its eastern bank and of one of the largest sandbanks in the river, on parts of which vegetation, including bamboo. has commenced to grow. There is a ferry from Kaduwela across to Malwana, a classical scene in the history of Ceylon, a visit to which was the main object of our down-river return

trip, and the incidents of which visit will be noticed subsequently. Meantime I would remark, that, as Kaduwela is only about ten miles from Colombo, a trip thither is calculated to be interesting and enjoyable to those who appreciate river scenery and rich tropical verdure, and who take an intelligent interest in the history of European connection with Ceylon : Portuguese, Dutch and British, as connected with the opposite remains of Malwana. The tree vegetation is richly luxuriant in the fertile alluvial soil deposited on the banks of the river, and the grass meadows which occasionally stretch away on each side are calculated to remind the traveller of English hay and clover fields, while the gradual transition from the flat country to the lower ranges of hills adds special interest to the journey. The prevalence of inconvenient but fertilizing floods in the Kelani valley, is indicated by long rows of guide-posts along the sides of the road, by which mail coaches, carriages, carts and foot-passengers are enabled to steer their way, when the waters are out, as a consequence of heavy and sudden rain-storms on the Peak ranges, from which to the sea the course of the river is not much more than sixty miles. The lower portion is lake-like in breadth and fulness ; but at about eight or ten miles from the mouth frequent and sometimes formidable sandbanks commence, by which the stream is compressed into narrow channels. The rapidity and force of the stream is, of course, in proportion to the narrowness of the orifice ; and while rafts, and especially boats, float easily down-stream, the difficulty of the navigation upwards may be judged of by the fact that while five hours on the water amply sufficed for our course of about 20 miles from Hanwella to the Bridge of Boats, 2½ days would be required for the poling upwards. In the case of large and heavily-laden boats (and we were interested to see that besides rice the cargo of one such boat consisted mainly of Japan-made* shooks of tea boxes) the difficulty must be much greater, of which indeed we had proof, in the desperate exertions and wild, plaintive cries of the polemen as they painfully urged their boats against the rushing water. Some of the cargo boats had masts, but we saw no sails actually used. The north-east wind was, probably, far too gusty for safe sailing. The usual voyage upward of boats carrying rice and other supplies for the Kelani Valley tea estates from the Bridge of Boats to Yatiyantota is ten days, and occasionally a fortnight is occupied in the transit. This is slow work, but probably neither cars nor railway carriage could compete with that on the river in cheapness. The contrast between the hard labour of the upward-voyaging boatmen on the river and their lounging, lazy countrymen in the villages on shore was striking. But no doubt the latter work hard in spurts, while the boatmen have compensation for the hard work up in the easy floating down. One conclusion forced on us by an examination of the great river for twenty miles of its course was the non-feasibility of dredging and keeping a navigable course open up this stream, at any but a prohibitory cost. The deposits of sand and silt are in some cases enormous, and we could see evidence of great erosion of the banks and shifting of soil from one side to the other. There can be no question that the felling of forest and the cultivation of tea estates along the upper portion of the river have tended to increase the impediments to its navigation by the quantity of silt washed down. And insanitation—temporary only, let us hope—has followed. On asking our good friend Mr. Amere-sekere as to the health of Hanwella, he stated that previously to the advent of the lowcountry tea enterprise the place was eminently salubrious, but that the change for the worse in the last five years had been marked. It is to be deplored that the advance of enterprise and material civilization, which cannot and must not be stayed, should involve such consequences,—in the inconveniences of which the planters and their coolies fully share,—and we can only hope for a speedy amelioration of climate or the discovery of a potent enemy to the organisms connected with what we call "malaria."

The once important Fort of Hanwella, situated on what, up to the cession of the Kandyan Provinces in 1815, was the borderland between "the Maritime Provinces" and "the Kingdom of Kandy," is interesting from the natural beauty of its situation and the associations, ancient and modern, connected with it. Malwana, in the Dutch period was burnt and its small garrison of invalids massacred, the destruction thus effected, and which led to war between the Dutch and Kandyans, accounting for the few vestiges remaining of the fort and the palatial country-houses of the Portuguese governors. Hanwella, although the Kandyans, in 1803 took possession of the fort and village, was not long in their hands. After three days' occupation, the Kandyan forces were ousted and driven back with great slaughter by troops from Colombo, under the command of Lieut. Mercer of H. M. 61st Regiment. The British troops seem, on this occasion, to have been aided by an auxiliary body of loyal Sinhalese collected by Mudaliyar Solomon Dias Bandaranayake. After the massacre of the British troops in Kandy, the elated traitor-king marched his army against Hanwella. But the small fort was held by a soldier of a different stamp to the wretched Davie. Capt. Pollock, with his small force, not only held his own, but became the aggressor, repulsing the enemy, who made a precipitate retreat, after great loss of men, arms and ammunition, and the abandonment of the royal standards. Very different and altogether pacific are the recent associations connected with the place in the successive visits to it, in 1870, 1876, and 1882, of members of the British royal family, in the persons of the Duke of Edinburgh, the Prince of Wales, and finally the two young Princes, Victor and George of Wales. All the royal visitors planted trees—jak, nuga, bo, mango, &c., four at least of which are flourishing, inside circles of laterite and cement. As records of the visits and the tree planting, there are inscriptions on three stone seats which are so placed on the rampart which faces the river, as to command beautiful views across and up and down the stream. The river takes a bend below the ferry, but upwards there is a long reach, the fine vista being closed by a grand background of the Adam's Peak mountains. The view of these, as dawn was breaking and the clear and increasing light revealed their features, before the sun had produced any curtain of haze, was exceedingly striking, contrasted as the blue of the distant mountains was with the silvery waters of the stream and the rich verdure of the vegetation in the foreground. The crisp temperature here on the morning of January 3rd, following a night of special coolness, almost made us fancy ourselves back in the mountains which are "round about" Nuwara Eliya, although the elevation above sea-level is only 40 feet. At 2¾ miles from Hanwella, indeed, en route to the mountain Lake where

* Made in Japan, out of timber from the forests of that island kingdom, by means of American machinery, and used for the packing of Ceylon tea,—surely a romantic incident in the free commerce of nations!

amidst the ranges over which Labugankanda (height nearly 1,500 feet) presides, we had only attained an elevation of 75 feet, the rise in the following six miles being to 306 feet, the level of the "top-water" of Labugama Lake. But we must dispose of Hanwella, famous, amongst much else, for a fairly successful experiment in teak cultivation. We can remember the grand old trees which were so injudiciously sold and cut down some thirty years ago. There is still a fine grove of these valuable trees, coppice and original growth, the light-coloured foliage of which contrasts strikingly with the prevailing greens, many of them dark, like the jak, of the indigenous and ordinary trees. Amidst the teak grove and outside the fort (the resthouse stands within its bounds) is the large and well stocked timber depôt, the timber in which, we understood, was entirely reserved for Government purposes, none being here available for sale to the public. We were interested to learn that a considerable quantity of teak seed gathered from the older trees at Hanwella, had been sent to Batticaloa, in the neigbourhood of which a fairly successful experiment in teak-growing had previously been made. It is to be hoped that the officers of the Forest Department may succeed in naturalizing *Tectona grandis* amongst our forest resources, for few trees surpass it in value. We should think that any quantity of seed can be obtained from the now grandly grown trees in the teak forest, which was formed on the west coast of the Madras Presidency by the Marquis of Tweeddale and the value of which, as time advances, has been computed at millions sterling. The experience obtained on the Anamallays, as to suitable soil and climate, cannot but be of great value to Ceylon. Amidst all the tree vegetation around Hanwella, bird-life is abundant; and we here enjoyed a woodland concert of mingled and melodious sound, unknown equally to dwellers in towns and the occupants of bungalows at extreme altitudes in the mountains. I am bound to admit, however, that the first herald-sound of approaching daylight, if not the last as "the gloaming" gave place tonight, consisted of raucous utterances of the ubiquitous and ever-in-evidence crows,—so unfavourably prominent with their fellow scavengers the pariah dogs in Sinhalese sannass: "May he who violates the terms of this gift, be born next in the form of a dog or a crow." The association is somewhat unjust to the crow on the score of addiction to water baths, for which the crow is famous. On the score of voice there is little choice between the two. Hanwella has, it seems, superseded the proper Sinhalese name of the place, Gurubewila, just as Welgama is now the commoner name of the place which the Portuguese and Dutch knew as Malwana. And here a fitting pause can be made before describing our journey in the hills amidst the solitude of which slumber the mirror-like waters of Labugama Lake, and the voyage down the river named after Kelani, the site of the ancient Buddhist shrine, a place so "pleasant," that Hindu legend represents the sun as pausing in admiration, as he comes over it in his diurnal course.

The road constructed by the Public Works Department specially for the purposes of the Waterworks, and which extends to a distance of 8¾ miles from Wakoya to the northern end of the Lake at Labugama, cost, including a sum of over R11,000 for land, a total of R175,000, or very nearly R20,000 per mile. The estimate in this case was exceeded by R100,000. At its commencement the track runs through valuable paddy lands and native gardens, whilst the upper portion had to be cut through the lower hill ranges, the mountain streams requiring bridges strongly founded and with openings large enough to allow free passage to the exceptional floods to which this region is specially liable. To such bridges and the sides of other openings, all the way to Colombo, the main pipe is to be seen attached, resting on rollers to allow the movement, slight though it be, produced by expansion and contraction from changes of temperature. During the period in which the work of Lake clearing and bund construction was carried on, flood water has been known to rise up to 17 feet over the level of the road; and it was affecting to learn how Mr. Burnett, suffering from lung disease of a serious nature as he was, rode and boated and waded through the waters of such a flood, in his anxiety to save the works from threatened destruction. That was the last and fatal blow to a constitution weakened not only by physical disease but by anxiety and repeated disappointments connected with the "service reservoir" at Colombo, which, however, he lived to see, with the rest of the great and beneficial scheme he had carried out, a perfect success and one of the greatest triumphs of modern hydraulic engineering: and that too, at a comparatively moderate cost. Visiting Labugama, as we did, on an intensely hot day (the walk up the zigzag path to the Engineer's bungalow about 2 p. m. was an experience easier to recollect than to endure), we could scarcely realize that Labugama forms part of the very rainy region which surrounds the Peak and extends from the sacred mountain as a centre along its flanking ranges and through the river valleys between them. The average annual rainfall, established by ten years' observations at Labugama, is, in round numbers, 160 inches, the deposit in 1890 having exceeded this average by 5 inches. The extremes have been between 187 inches in 1882 and 138 in 1888. The years 1882 with 187 inches and 1883 with 185¾ must have been terribly trying to the Engineers and the force of labourers engaged on the construction of the bund (just commenced), for work had to proceed continuously, and in digging exceptionally deep for a solid foundation all the expedients of scientific experience had to be resorted to, in order to avert the destructive effects of flood waters. With such a rainfall as we have indicated, continuous for a large portion of the year (the lowest average monthly rainfall is 4·42 inches for January), it might be supposed that the Lake (176 acres in area) would receive practically the whole of the rain falling over the "catchment area" of nearly 2,400 acres, in which there are no human abodes save the resthouse to which we have referred with the residence of the Engineer in charge and lines for a few coolies, all at the northern end. But the absorption of rainfall by the soil and vegetation have been on the scale thus indicated:—

In 1887, out of a rainfall of 174·89 inches, the loss from absorption was 42·55 inches, or very nearly one-fourth of the rainfall, the exact percentage being 24·32.

In 1888, the year of lowest rainfall recorded, out of 138 inches of rainfall, the loss was 31·29 inches, or 22½ per cent of the rainfall.

In 1889, with a rainfall of 159·28, the loss was 31·33, or 19⅝ per cent.

If such are the proportions of soil and vegetation absorption in one of the wettest portions of the island, readers can understand the much greater influence of this process in the dry and arid regions where the irrigation tanks are situated. Streams of limited size and originating in the lower and hotter "foot-hills" on the northern and eastern sides of our mountain

system cease to be perennial, and no wonder, when two, and we believe three, years of drought occur in succession. The tanks are then dependent entirely on rainfall; and considering the dry condition of the soil and the thirsty state of vegetation, we can understand why, for the re-filling of such a tank as Kalawewa, rain-storms of 10 to 20 inches in a few days are desiderated rather than the same quantity of rain distributed over a month. In the latter case the arid soil and the drooping vegetation would gradually absorb every drop of moisture that fell, leaving none to even partially supply the tank. But not only must the loss from absorption be greater in the dry regions, say 35 per cent. at least of the rainfall at Kalawewa, against 22 to 25 at Labugama, but the further loss from evaporation, which is astonishingly great in the cases of the Colombo and Labugama Lakes, must be enormous in regard to the streams and irrigation reservoirs in the hot, dry regions where the shade temperature goes up to 100°, and months succeed months, sometimes, when the heavens are as brass and the earth as iron. In Mr. Blanford's book on the climates of India and Ceylon, we have been surprised to find how few and uncertain the data quoted by him for evaporation are. Extended and careful observations by the Survey Department in connection with the Colombo Lake and by the Engineer in charge in the case of the Labugama Lake, on a system—in this latter case, inaugurated by the late Mr. Burnett—are likely, as Mr. Burnett pointed out in his most interesting final report, to give results of unique value to hydraulic science. Readers will be scarcely prepared to learn that the average daily evaporation from the Colombo Lake, with a mean temperature of a little over 80°, and an annual rainfall of 88 inches, is equal to 0·217 of an inch (the total area being 416 acres) or 2,045,589 gallons; the maximum evaporation on a dry day in February being 0·480 inch, or 4,524,804 gallons. Such, however, are the results of observations taken by Mr. Wackrill of the Survey Department. The decimal given for a dry day in February, be it noted, is very close on half-an-inch. We understood from Mr. Gibson, the experienced and intelligent Engineer in charge of the Labugama Lake, that he takes the most frequent and careful observations of the effects of evaporation on the mountain reservoir of which he is in charge, the extreme effect in one day being, we understood, ⅜ths of an inch. This is consistent enough, the mean temperature of Labugama being about the same as that of Colombo, but the atmosphere being so much the more charged with moisture in proportion to a rainfall of nearly twice the volume of that at Colombo. I cannot, in this connection, refrain from quoting the following paragraphs from the late Mr. Burnett's exceedingly able, honest and interesting report:—

The supply to the town at 3,000,000 gallons in twenty-four hours with strainer washing and scouring of wells, flushing, &c., absorbs about 33 to 34 in. of the rainfall.

The proper maintenance and working of the Reservoir, therefore, require the constant care and attention of a skilled and thoroughly reliable European officer at Labugama every day, and frequently at night, as the floods must be met and dealt with by the sluices when and as they occur; and it has been, and will be, only by the best and constant care, both days and nights when required, of the officer in charge in carrying out his instructions that the purity and safety of the water supply, which has now become a vital necessity to the people of Colombo, can be insured.

In the course of his work and inspection this officer is required to take, not only a daily record of the rainfall and level of the reservoir, but such constant observations both of rainfall and reservoir levels and opening and closing of sluices, as will enable a complete calculation to be made of the rainfall and the measure of its resulting flow of water, and the receipt into, and discharge from the reservoir of, this water. It is only on this knowledge that the volumes and duration of floods, and their proportions of yield of water to the rainfall, can be ascertained, and that the measures to meet them can be arranged.

The observations thus made enable both the total yield of the year's rainfall to be ascertained and the details of individual storms and floods, and give most important scientific information of, I believe, almost unique value as to the yield of rainfall in water discharge and the loss by absorption in the ground and by vegetation and evaporation in tropical mountain valleys. It is extremely rare in such conditions that the entire results of rainfall and discharge can be measured into a reservoir, as at Labugama, from such an area as a drainage of nearly 2,400 acres, and they should be of great value in the consideration of all works and matters connected with the discharge of the streams of the mountain and hill districts of this Island as well as elsewhere where similar conditions exist. These returns, both of the total annual results and particulars of exceptional floods, should form a part of the annual report of the Engineer.

As the road to Labugama pierces the outlying hills of our mountain zone it crosses the beds of several streams, the multitude of large boulders in which show the evidences of exceptional floods. The Wakoya is not the largest of the streams. It is excelled by the Kalatawa, the waters of which, however, could not be utilized for the formation of the Lake, owing to the lower level of this river. The road to Labugama has helped to open up the country around to the tea enterprise, and strikingly contrasted with the flat paddy fields near Wakoya were the tea fields on some hill slopes that for steepness could compare with some of the cultivated precipices in Haputale, which the railway will skirt as it approaches, over the narrow ridge along which will lie its final course, "the Pass" by which Uva is entered. "Mohideen's tea estate" (inscription on a board by the road side) looked so ship-shape and clean that we were curious to know about the exceptional "Moorman" who was so good a planter. The answer was "Mohideen's estate is looked after by Mr. Ross Wright." "All right," was our natural response. Young coconut palms, planted amidst tea, or as a separate cultivation, looked flourishing, but scepticism was expressed as to the trees' bearing well so far from the sea. The distance from the sea in a direct line being not more than twenty miles, the question arises as to the limit, in distance from the saline influences of the ocean, of profitable coconut cultivation. The best zone for the palm is usually defined as two miles from the sea, but coconut cultivation in many parts goes much further inland, extending in the case of the valley of the Kelani in unbroken groves along the banks of the river, from its mouth to Hanwella and still further towards Ratnapura. Many of the fine and flourishing coconut plantations beyond Mirigama must be more than twenty miles from the sea. In southern India the destruction of coffee by borer was traced to the fact that the cultivation had taken place on "bamboo-land,"—*Bambusa arundinacea* being, no doubt, the species in that case. Along the road to Labugama and in the Kelani Valley generally, the prevalence of the small bamboo of which tea baskets are made in such large numbers at Kalutara, and which is used so generally for fences in Colombo and elsewhere, seems to have no deterring influence on intending cultivators,—a considerable proportion, indeed, of the Kelani Valley tea estates being opened on land, the main vegetation of which

was the *Bata* bamboo. The elegant areka palm is at home in this region and the drive is altogether a pretty one. The approach to Labugama is indicated by signs of lessened traffic in the shape of a green grass covering over the grey gneiss "metal," which latter might seem superfluous if the size of the spare pipes lying alongside the road at intervals did not remind us of the heavy weights the road had to bear and many have yet to bear, in case of damage to the water supply source by exceptional floods. Those who constructed the road for the purposes of the Waterworks could scarcely have anticipated, even in their wildest dreams, the convenience it will prove. if, as is believed, an elephant kraal is arranged at Labugama in honour of the approaching visit of the heir to the imperial throne of Russia. The completion of this road will enable the Governor and his guests—the Tsarevitch and his suite and others,—to drive uninterruptedly over the 28½ miles from Queen's House to the margin of the Lake. Then the boat will be ready for the mile of Lake, and the horses which will be waiting at the southern end of the water will carry their riders by a well-cleared path, over the distance of 1½ mile to the intended scene of the "kraal," into which the now freely roaming and peacefully feeding monarchs of our forests are to be driven for human delectation—for the gratification of that hunting instinct which clings so tenaciously to our nature, even in those highest in rank and most advanced in civilization. The resthouse and Mr. Gibson's bungalow are likely to be utilized for the lodging of royalties and vice royalties, while there will be, of course, the usual temporary "Kraal Town" formed of cadjans, bamboos and similar materials. The kraal, if held, has every chance of being successful, for there are three herds of elephants, with which Mr. Gibson has established relations as amicable as those which now exist between the British lion and the Russian bear, and the benefit of his intimate knowledge of the haunts and habits of his friends of trunk raising and trumpeting fame cannot but be of great value to the leaders of the forthcoming "Keddah," as they call a "Corral" in India. The four-feet path formed round the margin of the Lake is, for the present and with reference to the approaching kraal, closed to the public, and we saw a few coolies going over its course with reference, we understood, to clearing it of all obstruction. To a Prince amongst whose future dominions the Caspian Sea is but one of many inland Lakes, the artificial lakelet of one mile long by about a quarter broad, in the Labugama valley, may seem but "a little one." But seldom in his travels can the Tsarevitch behold a scene more lovely, more intensely brooded over, normally, by the genii of silence and solitude—silence and solitude which will of course give place to sounds of genial festivity, when the representative of British royalty entertains in wildwood hospitality the heir of a monarch who, in a martial sense and the sense of owning a vast portion of the earth's surface. is amongst the most puissant of "Great Powers." But it seemed to us, on the occasion of our visit, almost desecration to break the silence of hill and forest and fluid, all sleeping around us as we glided in the hours before gloaming over the mirror-like surface of the impounded waters, not of the Wakoya alone, but of many other minor streams, distinguishable by the little "bays" and the better grown groups of forest trees at their inlets into the Lake. We were interested to learn, however, that submerged by the waters over which we floated were the site of a former village and a few rice fields. A small tope of coconut palms on the shore of the Lake had been levelled by elephants for the sake of the grateful food yielded by the tender tops of the trees. As we approached the northern end where the waters of the Wakoya lose themselves lovingly in the bosom of the Lake, memory awoke associations which led me to exclaim: "Why, here is a bit of the Trossachs, and there" (as we skirted a beautiful islet, seven acres in area) "is Ellen's Isle!" Mr. Gibson replied "That is just what Mr. John Ferguson said, when he visited the Lake;" and then our good friend expatiated on the delight which Sir William Gregory expressed with the Lake and its framework of jungle clothed hills. Sir William having cultivated a special taste for the beautiful, his judgment is of special value. He has seen all that Italy has to show, including what no one who has seen it can ever forget, the scene from Fiesole, outside Florence, bathed in the glories of a summer sunset; but when I once ventured the opinion that we had scenery and sky effects in the mountains of Ceylon, which compared favourably with the beauties even of Italy, his response was: "Compare with Italy! Why, Ceylon has a beauty of its own with which that of Italy cannot be compared Even in climate portions of Ceylon far surpass Italy." That was the testimony of a competent authority who had travelled extensively and observed keenly, with an eye open to the beautiful in nature, and I can fancy the author of "Lake Gregory" finding consolation in the fact that in the exquisitely lovely solitudes which surround the mountain mere of Labugama, no exigencies of a racecourse, as at Nuwara Eliya, will intervene, to convert what might have been a full and beautiful body of water into what is largely a series of ugly marshes. But lest I should further mar the tranquilizing and peaceful influences of the silent and solemn beauty which reigns over the waters of Labugama and the hills and forests which guard it and are mirrored in its bosom let me here make another pause. I cannot help recalling the terms of an epitaph I saw in Northern India: "Be still: she sleeps!" The being who sleeps in this case is the spirit-creation of a poet, who described her as

——————"Lady of the Mere,
Lone sitting by the shores of old Romance."

The circumstances and surroundings of the Colombo Water Supply Reservoir at Labugama, are of a specially favourable nature. The catchment area of nearly 2,400 acres is covered with dense jungle or forest and the streams which flow into the Lake from hills varying in height from 500 to 1,500 feet above sea-level, run over boulder beds, so that the very minimum of earthy matter is carried into the reservoir, while twigs and branches are intercepted at the mouths of the Wakoya and the minor streams. The sluice arrangements, too, for letting out, at the bottom of the reservoir, flood waters and such solid matters as may have subsided, are very efficient, and Mr. Burnett pointed out, in his final and most able report, how they could be made still more so. The usual depth of water at the bund end of the Lake is 60 feet, and Colombo is supplied from the top portion, not lower down than 36 feet in any case and as a general rule from not more than 12 feet below the surface. Added to this condition in favour of the purity of the water, it is passed slowly twice through 560 feet of copper gauze strainers of 900 meshes to the square inch. With such precautions and the keeping a margin of from 30 to 50 feet round the Lake free of forest so that a grass sward forms over it, there is no occasion for filtering beds at Labugama. Indeed Mr. Burnett showed, that, with doubled sluices and other expedients, the enormous quantities of flood and waste water which are now discharged into

the bed of the stream could be utilized as a further supply for Colombo. And, although, by the help of the service tank, with a capacity of 8,500,000 gallons at Colombo, three millions of gallons are now supplied instead of the two millions originally estimated, it seems probable that, looking at the rate at which the population is increasing, (2 per cent per annum at least,) the duplicating of the existing 20 inch pipe may, ere long, become necessary. It is just possible that Negombo, which is now dependent on wells at a considerable distance from the town, might, in addition to Colombo, be supplied from a second pipe? Mr. Burnett expressed the hope that the forest over the catchment area, in which there are no abodes save those we have mentioned and no cultivation of the soil, should be preserved in perpetuity. But as the larger timber trees within the reserve come to maturity, there is no reason we can see why they should not be dealt with by the Forest Department, the vacancies being filled up by planting seedlings or by natural reproduction. Meantime it would seem that there is scope for the planting of handsome and useful trees round the Lake, outside the grass margin, of course. The springing up from the waters, too, of a few of our indigenous freshwater fishes, during our visit, suggested the idea that here are most favourable conditions for breeding the gourami of Mauritius, the large golden carp of Java, and the best fishes of Southern India as described by Mr. Thomas. Apart from the economic value of the fish, we suppose their presence would tend to purify the water of the organic matter on which the fishes would feed. We need not tell our readers how greatly the margin of greensward adds to the beauty of the Lake, while the numerous boulders which are scattered over the surface of this margin give a fresh picturesqueness to the scene. At one place on the shore of the Lake, not far from the remains of the cocoanut tope which the elephants made short work of wh n the human owners of the palms had been removed, there is further evidence of former life and action, in the shape of mounds of earth thrown out in digging a plumbago pit. The construction of the bund was a work of no slight difficulty from the depth which had to be reached before solid rock without fissures was found. The length of the embankment at the top is 120 yards; the length of the foundation trench 160 yards; the greatest height of the embankment 72 feet; the greatest depth of the foundation trench 72 feet, and the greatest height from the bottom of the foundation trench to the top of the embankment 109 feet. The contrast of the bright green of the grass on the long outside slope of the bund and the dark weathered appearance of the blocks of gneiss of which the facing wall is composed and also the fragments blasted out of the spillwater channel, is very striking. Equally striking was the contrast between the surrounding expanses of wild jungle and the roses, hibiscus plants, bougainvilleas, crotons and other shrubs, which Mr. Gibson has succeeded in growing around his and his family's ruly solitary abode. The owner of a tea plantaion at least two miles distant talks of the Water Works Engineer as his "neighbour, next door." We were glad to find that the family had not suffered from fever, the Engineer himself being a picture of robust health, notwithstanding the performance of duties which involve constant exposure to the weather, by night as well as by day.—The total capacity of the reservoir (176 acres area, and 360 feet above sea level, or 260 feet above the level of the water in the service tank on the summit of Maligakanda at Colombo) is no less than 1,373,000,000 of gallons, equal to 25½ inches depth of rain on the drainage. As we have already stated, the Colombo supply is drawn at depths below the surface of 12, 24 or 36 feet, and the capacity to the lowest level of supply is 1,233,000,000 gallons, equal to 6,000,000 gallons for 200 days. It will thus be seen that if no serious accident happens to the great pipe, against which all possible precautions are taken, there is no fear of the continuance of an ample flow of water to Colombo. The main pipe is 25 miles and 5?2 yards in length from the straining well at the outlet towers in the Labugama Lake to the Maligakande reservoir at Colombo. I now again quote some interesting details from Mr. Burnett's report:—

The top level of Labugama reservoir is 360 ft., and the water-level in the gauging tank is 102 ft. above sea; the fall is therefore 258 ft., giving a head or loss for friction of 10⅓ ft. per mile. The pipe thus delivers 3,000,000 gallons in 24 hours as measured into the Service reservoir.

The level of the pipe where it leaves the straining tanks at Labugama is 303½ ft. above sea. In three miles from Labugama it falls 233½ ft. to the level of 70 feet. In three miles further it falls to the level of 30 feet, and crosses the Hanwella flat, 19 miles from Colombo, at the height of only 20 to 25 ft. above sea level. For 16 miles out of the remaining length the level of the pipe varies from 5, 10, and 15 to 20 and 25 feet above sea level, rising at intervals for short distances to 30, 60, and 70 ft. For 19 miles the pipe is thus subject to a pressure of 300 to 355 ft., or about 130 to 150 lb. per square inch when a valve is closed. Great care is therefore required in working the valves to prevent shock on the pipe, which would lead to certain breakage, and special valves are placed every half mile or so for this purpose, so that every half mile length can be isolated for repairs when required—even then, special care and training is necessary to avoid danger in dealing with the heavy pressure on the long length of pipe.

The extremely flat contour of the section for long lengths required special arrangements in creating artificial summits for the escape of the air disengaged from the water in motion, with the necessary air escape valves, in order to prevent the flow of water being reduced or stopped from the pipe becoming charged with air. These air valves are often required in duplicate, and are placed from one-eighth to one-fourth mile apart where artificial summits were made, and on every natural summit along the line of section. Cleansing valves have been placed at every depression or hollow for scouring and emptying the pipe. Altogether there are on the main pipe 48 special stop valves, 20 in. diameter; 44 special stop valves, 8 in. diameter; 61 cleansing valves, 6 in. diameter; 106 air valves with stop valves, 4 in. diameter. These all require inspection, cleaning, oiling, and other attention from time to time to maintain them in good working order.

The main pipe is laid either in or alongside the public road from Colombo to Hanwella. For this distance the country is subject to floods two or three times a year, for several days together, and these floods rise to a maximum, as in 1872 and 1883, of 12 and 17 ft. respectively, above the road and pipe.

The road is in many places embanked, and generally the permanent water-level of the country is only about 4 to 5 ft., even in the driest times, below the surface. It therefore was necessary to keep the main pipe above the permanent water-level and as high as possible in crossing streams in reference to the flood and to the free drainage and escape of water from the land. This necessity required numerous and wide openings over drainage outlets and streams. There are thus 56 crossings in all; of these, 42 vary from 6 to 24 ft. openings and 14 vary from 48 to 196 ft. in length.

The foundations of these bridges are below the ordinary water-level, and 60 of the piers are founded below sea and permanent water-level. The ground consists of beds of sand, gravel, clay, and peat and soft deposit, alternating, and to avoid deep foundation, such as iron cylinders, the piers were made solid blocks of brickwork with as wide a base as possible, so that they could be

forced down by weighting to a bearing should any settlement take place. In only five instances has this occurred, and has thus been met without risk and in only one instance with stoppage to the supply by he main pipe. All are now sound.

The two highest localities in the town were Elie House, where the ground is 100 ft. above the sea, and Maligakanda, where the top of tho hill was 70 to 5 ft. above the sea. It was therefore impossible to obtain the usual working pressure for the town d stribution piping of 150 to 200 ft., and this was therofore reducod to the lowest safe working limit of only 10 ft. per mile of distribution.

The Elie House site had the advantage of 25 ft. greater elevation, but to deliver the water from Labugama there, instead of Maligakanda, added about a mile in length to the main pipe, while after being brought there the greater bulk of all tho water had to be conveyed back again about three miles to the middle of the town, whereas at Maligakanda it was ready to hand. Besides the additional cost of these four miles of large piping about R200,000, the greater distance the water had to be conveyed from Elie House required 30 feet higher elevation in a reservoir there than at Maligakanda to give the same general pressure over the town.

The water had to be delivered, at such times as the full demand exists, at the levels equivalent to 80 ft. in the Fort and Wolfendahl, 70 ft. at Fishers' Hill, and at least 40 ft. at Pashetal in the north and Wellawatta in the south. These requirements have been since proved correct by the frequent complaints of want of water and want of pressuro previous to the receut completion and use of the service reservoir, and created the necessity of raising the sorvice reservoir to give the level of 100 ft. to the water at Maligakanda or 130 ft. at Elie House; in either case an elevation of 30 ft. above the around level.

The cost of the reservoir would therefore be the same at either place, and the Maligakanda site was adopted, as it saved the four miles of large pipes and gave a much more convenient centre for working the distribution. As it is, the northern main from the reservoir is five and a half miles long and the southern pipe four miles.

By the original design this reservoir was excavated from 10 to 15 ft. into the ground, and the water level was raised 30 feet above the surface with massive walls of cement concrete. The top was covered with a double ventilating roof of thin concrete arches, and the floor was also lined with 12 in. of cement concrete. The concrete for the whole of the work was put liquid into the site, the walls being faced with 10-in. concrete blocks on both sides. The inside dimensions of the work were 190 ft. and 191 ft. 4 in.; depth of water, 40 ft.; the height of the walls from foundation to top of parapet, at upper roof, 49 ft.; and thickness of walls varying from 5 ft. 9 in. at top water level to 19 ft. 9 in at the bottom, the r of parapet being from 3 to 2 ft. thick. The water capacity of the reservoir was to be 8,500,000 gallons.

Then follows the history of the service reservoir, until the addition of an earthen embankment and division into sections preserved the concrete wall from expansion and contraction, from changes of temperature so great occasionally, we believe, as a difference of some 70° in the 24 hours, while percolation through the cement and concrete which Mr. Burnett, (mistakenly, we believe) held to be impervious, was prevented by an internal skin of waterproof and elastic asphalte. Our readers will be interested to learn that the weight of the masonry of the Maligakanda reservoir is no less than 40,000 tons; of the earthwork 39 000 tons; of the water 38,000, or 117,000 tons in all, resting on the laterite foundation. The total length of piping of all sizes is no less than 85¼ miles; public stand pipes in Colombo 664; houses with separate services laid 1,414; trade supplies 30; garden supplies 43. As regards separate services for houses, it must not be forgotten that in many cases there are excellent wells attached to a good many houses, such as those on the sea-side of the road at Kollupitiya. Brackets, as recommended by Mr. Burnett, are now being attached to some of the standpipes, and it is to be hoped that the present reckless waste of water at these standpipes where many of the people bathe as well as draw water in a most careless manner, may be checked, if not entirely prevented. The consumption of water per head of the population at present averages 19 gallons per head per diem. The use of the service reservoir, containing 8,350,000 gallons, with a depth of 39 feet, the inside dimensions being 190 feet by 191 feet 4 inches, has added 40 per cent. to the water available by day to the town, with an increase of 40 feet pressure. If roads are to be thoroughly watered, drains properly flushed, public baths provided, and the Colombo Lake kept full of water, even when evaporation takes away half an inch per diem from its surface, a new pipe from Labugama to Colombo must soon be laid. The difficulty is that already, in consequence of the necessity of meeting interest and sinking fund for the repayment of the portion of Water Works Loans allotted to the Municipality, the assessment of property in the town has reached 11 per cent. on the annual value. But with its grand harbour and other advantages, the population of our chief city is rapidly increasing, and wealth and the value of urban property must increase in proportion. The cost of bringing pure mountain water from the beautiful Labugama Lake within reach of the inhabitants of Colombo has been not far short of £350,000. But even so, the cost is comparatively moderate and the boon in a sanitary and general sense is really priceless. The cost for each gallon of water sold in Colombo, before the Waterworks came into play, was 1 cent; it is now the merest fraction of a fraction of a cent. For a consumption of 19 gallons per diem, or about 7,000 gallons per annum, per head of the population the average cost per annum for each person is only 65 cents, the water being as pure as any in the world; while the supply in olden days was frequently brackish, unwholesome and insufficient. Let the inhabitants of Colombo, therefore, while grateful for the benefits of one of the best water supplies in the world, remember with respect the name of the engineer who, bearing up bravely against anxiety, obloquy and the inroads of fatal disease, just survived to see the great work he had initiated and carried on to a successful conclusion, so thorough a success as it now is. A memorial stone in honour of Mr. Burnett ought to be erected on the bund of the beautiful Lake of pure mountain water at Labugama.

Before saying farewell to the lovely Lake of Labugama, and its romantic surroundings of hill and forest and greensward I must refer to a few unextended notes. The elephants, besides levelling a score of coconut palms on the border of the Lake, which belonged to the submerged village, also killed a caju tree by denuding it of bark. Recalling reminiscences of "The Lady of the Lake," we asked Mr. Gibson if he had ever seen deer take to the water at Labugama. The answer was in the affirmative: sambur and red deer and that exquisitely formed miniature deer, the meminna, had all been observed swimming. With reference to the climate and soil, too we were told of a rain storm of 9½ inches in 4 hours, which had produced no appreciable wash.

Having thus noticed the main incidents of our pleasant trip to the Labugama lake and some of the main facts connected with the transmission to and distribution in Colombo, of its waters, by gravitation (we were told of a pressure of 107 lb. to the square inch?), we reserve for a final

notice the record of our boating trip down the Kelani river to the Bridge of Boats.

Before we start downwards from Hanwella, on our nicely platformed double-canoe, comfortably roofed, and prettily ornamented with the tender leaves of the coconut palm, with bunches of king coconuts and strings of kitul seeds, another of our party will recall some reminiscences of what was long the border post between the maritime possessions of successive European powers and the mountain kingdom of Kandy:—

"Hanwella is not, so far as I know, mentioned by the Portuguese writers; but they and the Dutch refer to the place under its alternative name of 'Gurubęwula' (? 'the great hilly eminence'), which is spelt 'Grubsbe' in Ribeiro's map; 'Grouabely' in the map in Spilbergen; 'Grouably' in De l'Isle's map in Le Grand; 'Gourbevile,' 'Goerbevele' and 'Goerbeville' in Valentyn; 'Orwevel' by Daalmans; and 'Horrenwebel' by Herport. The name 'Hanwella' does not undergo such transformations, the worst one being 'Anguellen' in Daalmans. The fullest description of Hanwella in the Dutch period is given by Heydt, who accompanies his description with views of the fort from the east and the west (drawn in 1736) and a ground-plan. The fort was built of squared-stones, and had two whole bastions facing landwards, two half-bastions facing east and west, and a horseshoe facing the river, while round it was a dry ditch. It was capable of mounting 32 cannon, but only half that number were actually mounted. The garrison consisted of only 30 to 50 men, who were sufficient, says Heydt, to withstand 50,000 or 60,000 natives, as the latter possessed no large field artillery. The fort was intended to guard the high road between Colombo and the Kandyan frontier, and also the waterway of the river. Inside the fort in Heydt's time were a number of fine tamarind trees. The gateway was in the eastern side of the horseshoe. By the horseshoe on the edge of the river bank was a little summer-house. On the south western bastion was a belfry. The officer in command did not reside inside the fort but in a house outside. While Malwana was to the Portuguese a pleasure retreat and sanatorium, to the Dutch Hanwella was a place of punishment for mutinous and disorderly soldiers, and was considered a penal settlement. A European student who was amongst those sent to this place left his opinion of it in some lines which Heydt quotes as follows:—

Is dit het Schoene Land? leit Adam hier begraven?
Is dit het Paradeys vaen Gottes Hand geplant?
Kan hier ein ebrlyk Mensch syn Dorst nog Hoenger laaven,
En leven nog in vveld? 't gaat boven myn Verstand.
En Patt- en Schlangen-Nest, voll Berg en tiepe Daalen,
Blud-Suygers sonder Taal en Schagers die het Geld
Uyt Sacck en Beürsen haalen, en wat nog hier is all
Soot men ook vvilt betaalen, Krsigt mens maar bey Gefall.
Is dit het Paradeys, soo ists van Gott vervlookt,
Die meent verloost te syn, der Beed, Vast, en versookt.

This may be freely translated as follows:—

Is this the lovely land? does Adam's corse here buried lie?
Is this the Paradise of old planted by God's own hand,
Can any honest man his thirst or hunger satisfy,
And yet remain in health? That's more than I can understand.
A nest of toads and snakes, and filled with hills and valleys deep,
Bloodsuckers numberless, and taverners who filch the coin
From out one's purse; and what one here considers all in all,
I speak the truth, one only gets as chance may so befall.
Is this the Paradise, then 't is by God accurst, I say,
Who wishes to be freed therefrom must fast, beseech, and pray."

Taking early tea before we started from Hanwella, we carried our breakfast with us in the boat, the *al fresco* meal being enjoyable, after we had feasted our eyes and hearts on the beauties of the river which has its origin on the Adam's Peak ranges, and which along its whole course is bordered with varied and luxuriant verdure. The morning air was deliciously cool and as the sun became powerful; the heat was tempered by the north-east breezes, except on the few occasions when sharp bends in the course of the river placed masses of trees in front of us which interrupted the movement of the wind. The succession of long reaches, curves and frequent sandbanks gave interest to the early portion of our journey, and from first to last the river banks were densely lined with indigenous trees and coconut palms, if the distinction is permissible. Prominent as an edging to the water was *Hibiscus tiliaceus* with its large heart-shaped leaves and yellow blossoms, the latter closely resembling those of the *suriya* (*Thespesia populnea*), with *pandanus*, large lilies, and numerous flowering creepers. We were interested in identifying (occasionally appealing to the boatmen for native names) the various trees on the banks, amongst which the rich purple-red foliage of the *hal* was striking, as well as the scarlet tints of the leaves of *Lagerstrœmia regina*, the splendid flowers of this tree having given place to seed spikes. But next to the bending coconut palms, the prevalent vegetation was that of the graceful yellow stemmed feathery bambu, a plant which combines utility with beauty in an eminent degree. The framework of rafts is generally composed of bambus, and we saw some of these putting forth young shoots as they floated on the water. At night the bambus are the favourite haunts of thousands of fireflies which at intervals, as if by intelligent direction or arrangement, hide and then flash out their brilliant phosphorescent light amidst the branches. Generally the bambus were in detached clumps, but occasionally they were in long rows, forming a series of the most exquisite gothic arches, as the bending branches of separate groups met above and crossed against the sky. Occasionally, at the multitudinous ferries and bathing places, we got a glimpse inland, the expanse of an emerald green rice field relieving the monotony of the luxuriant tree vegetation. Scenes of ferrying, navigating by boats and rafts, fishing and bathing, with the flights of kingfishers, water-hens, and sandpipers imparted life to the river. But the very richness of tropical vegetation has its disadvantages, as from a river such as the Kelani, we see but little of what makes a voyage up the Rhine, for instance, so interesting: towns and ruins, vineyards and orchards. Successive landings would be necessary, even to see spots with which interesting associations are connected: Kelani Buddhist temple for instance, the history of which, as a site at any rate, is said to go back some twenty centuries or more With a strange idea of morality, an ancient legend records that, as retribution, not for the sin of a Buddhist priest who was discovered in an intrigue with the Queen, but that of the monarch in putting the "holy" man to death, the waves of the sea encroached on the land until 640 villages (470 of which were principally inhabited by divers for pearls) were overwhelmed, the distance between Kelani and

the sea-coast being reduced by about 25 miles. The probability seems to be that some geological catastrophe is shadowed forth in the legend. At present the belief is that Ceylon is gradually being upraised in about the proportion that the mountain tops are lowered by disintegration from tropical heat and rainfall. One of the associations connected with the Kelani is that Bhuwaneka Bahu VII., King of Cotta, who about the middle of the sixteenth century allied himself with tho Portuguese, was accidentally shot by a gentleman of that nation on the banks of the river. Half a century ago the Kelani Valley in the neighbourhood of Hanwella was a favourite resort of elephant hunters, and I have a vivid recollection of poor young Wallett, of the Roads Department, son of Major Wallett, being killed by one of those animals, and the immediate vengeance taken, at considerable risk to their own lives, by Capt. Payne Galway and other friends of the victim.

But the main object of our trip down the river was to visit MALWANA, the very name of which is redolent of flowers and sweetness. We were subsequently glad that the boatmen, instead of landing us n the mouth of the fosse (tho *wana*, or artificial water channel) of the ancient fort, took us further down. We were thus compelled to mako a long circuit, through villages, bazaars and fields, which gave us new impressions of what purely native life and conditions are. We did not traverse roads other than the native paths which, in all probability, are unaltered, save in being worn by the feet of succeeding generations, since the days when the Lusitanian Doms had here their palatial country residences, in connection with the fort on the river bank, the contour of which we were able to trace amidst the jungle which has overgrown alike moats and walls and what looked like a corner battery. looking up the river. Proceeding along the jungle paths we were surprised to find that they led us into quite a populous village with a well supplied and lively bazaar. Two well-built mosques and the appearance of well-to-do "Moormen" in the bazaars showed the predominance of the Muhammadan element in this busy and beautiful place. Amongst our party was the author of "Ingē Vā;" and by the medium of a peculiar dialect of Tamil, sometimes hard to understand, a leading Moorman boutique-keeper gave us, through our companion of Dravidian tongue tendencies, a good deal of information as to the site and traditions of Malwana. "It has that name," he said, "but the people now all call it Wélgama." In taking a circuit to the fort we passed through exceedingly fertile, rich-soiled fields of grass, and grain, with patches of vegetables and groves of fruit trees. The crossing of the Malwana-ela by trees laid from side to side with a very shaky bambu hand-rail tried the nerves of some of us; but when an hour and a half had been spent in interesting explorations, we all felt that we should not have missed this glimpse into rural and village life on the banks of the "Pleasant" river and so near Colombo, on any account. And this although no inscriptions, ancient or modern, rewarded our search. We heard of and examined fine slabs of stone in the verandah of a mosque and that of a superior Moorish house, but there was no vestige of lettering on them, and they had been taken not from the European fort we had come to see, but from the more conspicuous ruins of a native one on a height lower down, the river of the existence of which we had no previous idea. An intelligent Moorman, who acted as our guide, told us it was known as "HADI-DAMALA," and that tradition connected it with a Tamil Rajah who once reigned here. It is surely curious that the Portuguese and Dutch writers who have described Malwana take no notice of the more ancient fort which probably was fairly intact in the Portuguese period. If any reader is in possession of information regarding the alleged Tamil fort or can point us to any references to it in the literature of Ceylon, we shall feel indebted for the courtesy. Near the Tamil fort and the Moorish residence already referred to, were some evidently very aged trees, jaks and bilimbis especially,—of unusual size and gnarled to a degree. There was one lady in our party, and she was invited into tho Muhammadam abode, placed on a chair and intently stared at by the women and children, the one disappointment being that she could not speak Tamil. Before leaving this interesting place we ascended a great boulder which juts out into the river and commands an extensive view, including the vast sandbank already mentioned as lying in the Kelani, between Kaduwela and Malwana. The historical references to this fertile and really beautiful place we leave our companion who is specially well read in such lore to summarize:—

"Malwana was chosen by the Portugueso more as a country-seat for the Governors of Colombo and a sanatorium for the troops than as a military post. Sá e Menezes says:—

'The Governors held their court in Malmuana [Malvana], three leagues from Columbo, in sumptuous Palaces, which thoy called Rosapani: here three times in each year came to visit them the principal Zingalas of the Island, who brought with them large presents, as a sign of thoir friendship and allegiance.'

Ribeiro says:—

Malvana, was situated on the bank of the river, about three leagues from Colombo; moreover, it covers a small area with a square redoubt, without any flank. In it resided a Captain, Ensign and Sergeant, and the soldiers who went there from the hospital became convalescent and returned to their camps. It had a church, a chaplain, a storehouse for provision and ammunition.,

To this Le Grand adds;—

'Malwana never was reckoned a fortress; it is only a country seat at which tho Captains-General usually resided: they had a handsome palace there called *Rosa-pani*; and as the air was believed to be purer there than anywhere else in the whole land, those who were convalescent were sent there to recover their strength.'

The Captain-General of Colombo, according to Ribeiro, assumed the title of 'King of Malwana.' In the curious map in Spilbergen is entered 'Malleuano,' and in the itinerary in the same work the name is given as 'Malevano.' Baldæus does not mention Malwana; but he gives the place in his map, which also has 'Iassepane.' Heydt in his map of the Colombo disawani gives 'Maluvane' as a fort, but puts 'Rassepanne' a long way off westwards. Fraser's great map gives 'Rassapane' a little north-east of Malwana. The Portuguese 'palaces' seem to have disappeared soon after the Dutch conquest; for when Dr. Daalmans (who calls the place 'Malluanen') accompanied Governor Pijl thither in 1687 they were entertained in a hut covered with white cloth. "In 1736 a detachment of troops, 82 strong, sent by the Dutch to put down a revolt among the Chaliyas of the Siyane Korale, was driven from Attanagalla by a large body of lowcountry Sinhalese and Kandyans, with a loss of two field-pieces beside ammunition and baggage, and forced to retire to Malwana. The small fort that had been thrown up here was, however, attacked by the Disawa of the Four and Seven Korales at the head of some thousands of men, and was utterly demolished, the guard of lascoreens perishing in the flames. This

act gave rise to a formal war between the Dutch and the Kandyans. In 1881, when the last census was taken, Malwana contained 63 houses and 342 persons. Rasapane does not now exist, apparently: at least it is not mentioned in the last census report. The name may mean 'sweet drink,' 'sweet plain,' or 'rose plain.'

By the time we had again embarked after our visit to the melifluous named Malwana, we were quite ready for breakfast, of which we partook as we glided gradually into deeper and broader water. It was a pleasant incident in our voyage that soon after we came in sight of the grand railway lattice bridge, the 2 o'clock train from Colombo to Kandy rattled over it. I was reminded of the period, now a quarter of century ago, when the first train (a holiday trial one) which crossed the original bridge was seen by me, also from the river. How much has railway communication done since then for the island, which water carriage and road traffic could never have accomplished, in furthering the progress of prosperity and enabling the country to bear and overcome adversity.

P. S.—I find still one note of information obtained at Labugama unused. Mr. Gibson told us that on occasions of the annual, or rather periodical, migration of butterflies, he has seen the lake surface perfectly white with the moving masses of insects, while a number of "large swallows" were actively preying on them. The butterfly-eating bird was probably the alpine swift, *Cypselus melba*; or perhaps the Indian swift, *Cypselus affinis*, the *Wæhælaniya* of the Sinhalese.

Here ends the record of our pleasant and interesting "Holiday Trip to Labugama Lake" and the return voyage down the Kelani from Hanwella to Malwana, and finally to the Bridge of Boats, the recollections of which vie in interest with what poetry has imagined in descriptions of Fairy Land. The Dutch student who scoffed at the earthly Paradise on the banks of the Kelani was a miserable misanthrope!

A NEW SOURCE OF VANILLA.

Vanillin is the odoriferous principle of vanilla, which from a previous paper our readers know to be the fruit of a plant called *Vanilla aromatica*. Vanillin exists in the vanilla pod to the extent of about 2 per cent. These pods used to be very expensive, but new sources of vanillin are being discovered, and it seems likely that the vanilla industry will soon be extinct. Vanillin, which is the only substance for which the vanilla pod is valuable, has been found in asparagus, raw beet sugar, and assafœtida; it likewise results from the oxidation of olive wood. On a large scale it is prepared from coniferin, a compound which occurs in the sap of the cambium of pine-trees. The latest source of vanillin has been discovered by Herr Schneegans in the seeds of *Rosa canina*. These are extracted with ether: part of the ether is separated by distillation, and the residue is agitated with sodium bisulphite solution saturated with sulphurous anhydride. Dilute sulphuric acid is then added, and finally, after much washing and drying, a brown oil is obtained, which in a few days becomes a mass of crystals. Possibly the vanilla pod will find a new commercial rival in these *Rosa canina* seeds. —*Grocer*.

CABBAGE FOR EVER.

The London *Daily News* has the following amusing skit at the expense of the vegetarians:—

The Vegetarian Congress has dispersed to the four winds of heaven, leaving upon the minds of some who take life seriously a sense of humiliation. All the other Congresses have left behind them a pleasant impression, for they have given the race some ground for hope that it is getting on somehow—making, in spite of all its blunders, for righteousness. But if we are to believe the Vegetarian Congress, we have not yet learned how to live. It makes short work even of the last shred of definition of himself to which man has clung—an animal that cooks its food. He cooks, certainly, but it is not food. Four or five millenniums have passed since the pyramid of Cheops first looked down on the Nile, and the Neanderthal man became dust myriads of years ago, and yet we do not know what is good for breakfast. Instead of doing our best to unravel that problem, we have been frying one another about theological propositions. When the great problem is at length started, we find that the new doctors of the law differ as widely concerning our perishable bodies as the old doctors concerning our immortal souls. "What the Vegetarians want is to know what the right and proper foods are." Such is the surprisingly innocent, naïve observation made at the Congress by a vegetarian of the Nut-Eating Sect, Mr. Manning. In course of time there will be as many rival sects of Vegetarians as there are rival sects of theologians. Here are the Nut-Eaters, with Dr. Densmore at their head, proclaiming that grain food is as perilous to the body as beef and mutton. Starch is the heretical element, so to speak, in grain food. But then comes Miss May Yates, an ornament of Vegetarian Orthodoxy, and Miss Yates announces that outside whole meal there is no salvation. These are the two Schools, or Churches of the Vegetarian faith—the nut-eaters and the grain-eaters. But there are minor denominations, which borrow from either side the doctrines that seem to them most reasonable. There is even a mystic sect in process of evolution. Thus Mr. Jeffreys described, amidst rapt silence, to his audience in the Memorial Hall, how when he wanted his thoughts to concentrate themselves upon the physical world he "took cereals," but "fruit" when he communed with the unseen. The President, Mr. A. F. Hills, is an out-and-out Mystic; "pulse," quoth he, for muscle; "cereals" for brain, "fruit" for the soul, and nuts for the mighty spirit of man. Dr. Densmore however nearly concedes the anti-vegetarian doctrine when he permits a diet of "eggs, milk, or cheese." If these be not animal substances what are they? The English have conquered the world on beef and bitter beer. Perhaps they might have done it as well on pulse. We cannot tell; but we do know what they have done on the other diet. Then there is this disquieting thought: At the British Association, Mr. Ravenstein argued that in two centuries the earth would be full; but that is not the question at issue—what we want to know is how the supply of nuts can be kept up for the consumption of this rapidly increasing human race. The practical conclusion is, that while the Vegetarians are trying to agree among themselves, we had better go on with our beef and mutton—but in moderation. The solid basis of truth in the Vegetarian doctrine—which we are glad to say is doing immense good in the world—is that English people eat far more flesh meat than is good for them.

RUSSIA AS AN OUTLET FOR INDIAN TEA.

To the Editor of the HOME AND COLONIAL MAIL.

SIR,—In the letter which you kindly inserted in your issue of Oct. 24th I promised to return to this rather interesting subject.

Since that date our Ceylon competitors—always in the forefront of the battle—have clenched the matter, and sent out Mr. Rogivue (whom I alluded to in my previous letter, and who has since been over here to report progress) to commence a campaign in Russia. They have liberally subventioned him, and invited him—if he should find more money necessary, in order successfully to prosecute the enterprise—to apply to them again later on, and that he need not fear lack of support.

I had intended suggesting co-operation on the part of the Indian planting community with Mr. Rogivue's

enterpriso, with a view to bringing more money to bear upon what will undoubtedly be an uphill and costly game. From enquiries, however, which I made, both of Mr. Rogivue himself and of other Ceylon men, I found that such co-operation would not be very easily arranged.

Meantime, it cannot but be that the Ceylon Planters' action will "break the ice" for their Indian "brethren" as well as for themselves, and that the introduction of *Ceylon* tea into Russia, if successful, will be but a stepping-stone for *Indian* to follow on.

Now, at the first blush, it will no doubt occur to your readers—especially to your planting readers in the distant junglee—that the Indian industry should at once raise a fund and proceed to follow in the lines of the Ceylon men. I do *not* however, meantime, advocate such a etep, for reasons which I will endeavour to stato as briefly as I am able.

1. Owing to the action already taken by Ceylon (which will break down the Russian prejudice in favour of China teas), it is lees necesseary now that India should act than it was.

2. In view of the recent heavy calls made upon the Indian community (1) in starting the New York scheme (*The Associated Planters, Limited*) and (2) in introducing Indian tea into France, both at the Paris Exhibition and subsequently, I fear that it would bo oxtremely difficult to induce our *tea circle, for the present* at least, again to subscribe money for this purpose.

3. For reasons which will be obvioue for those of your readers who are intimately acquainted with the inner workings of the wholesale (especially the export) distributive and dealing trads, I have, after a good deal of reflection, come to the conclusion that it is inexpedient to take, hastily, any action which might tend to interfere aggressively with the operations of the large export tea houses, especially those carrying on business between London and Moscow, and that it would be better at first to endeavour rather to gain their co-operation and good-will, so that our teas may be brought a little more prominently than hitherto before the Russian consumere.

As already indicated, almost all the conditions are, comparatively epeaking, in our favour, and "time" also "is on our side," henco thero is no need for any hasty, and possibly ill-considered, action.

Two things, however, I would suggest :—

1. That steps be taken by the growers, either through the Tea Association or by means of a committee, to get into communication with the principal Russian tea merchants in London, with a view to ascertaining if any special steps can be suggested for facilitating the introdnction of our tea into Russia.

2. That growers, either by means of written communication or by a personal deputation, approach the Russian Government either through our Foreign Office or otherwise, with a view to pressing the Russian finance authorities—*in the interests alike of the Russian people, and of the revenue,* to consider the expediency of a reduction in the heavy duty now levied on all sea borne tea, whether imported from or through Odessa.

There is every reason to believe that such representations, if properly put forward, would receive fair consideration from the Czar, at any rate, since the well-being of the people (closely connected with which is the supply of cheap necessaries of life) is supposed to occupy his mind especially at this time, and seeing also that the Russian Empire is not itself a tea-producing country.

Apologising again for the length of my letter, but trusting, however, that it may be the means of directing attention to the important question of opening up an Indian tea trado in a tea-drinking country of 100,000,000 inhabitants. I am, &c., G. SETON.

14, St. Mary Axe, Dec. 17th.

DURING their vieit to Aesam the locusts did not damage the tea when in hard leaf, but stripped a considerable amount of young tea a year old.—*M. Mail*, Jan. 7th.

THE DIVIDENDS OF INDIAN TEA COMPANIES.

About this time of the year the directors of the many Indian Tea Companies announce the ad interim dividends that they may feel justified in declaring. Although, of course, such announcements do not furnish sufficient data to estimate the results of the year's working, they must be accepted as supplying no slight indication of the proepects which the directors consider to lie before them. Accordingly we may fairly deduce from the etatemente published, so far as we have seen them in the English papers, the concluaion that no very promising prospect is anticipated of the working of Indian tea gardens during the current year.

For we observe that the interim dividends declared by the directors of the several Companies—so far as they have yet been heard of—in no case exceed 3 per cent, the majority of instances notified not having passed the limit of 2½ per cent. We may fairly contrast such dividends with those which the majority of the Companies working tea estates in Ceylon have thought it justifiable to declare. The contrast is in nearly all cases very striking. We must, of course, exclude from such a comparison those among the Companies working in this island which—established as coffee growing Companies—have had forced upon them the conversion of the estates they were possessed of into tea gardens. In the case of these it was not to be expected that they would be able to compete in the matter of declared dividends with the Companies more lately formed which have taken over properties already well advanced with the growth of tea. It is only with these latter that a fair general comparison with the gardens of India can, as the rule, be instituted. For it must be recollected that no such hampering process of change in cultivation as we have above pointed out has ever been a necessity to the Indian tea planter. In this case he has either had fresh and unbroken soil to work upon, or he derives his profit from tea gardens of a mature age in a high degree of cultivation. If we go back some twenty-five years or so, before Ceylon had entered as a competitor in any degree with India in the production of tea, it will be found that at such a date tea-growing in India was among the most paying of the industries of that Empire. The cause of the falling-off in this respect at the present day is not far to seek. Indian tea at that time purchased in Calcutta was charged as high for the better sorts as 4s 6d per lb.! We have only to contrast such a price with that obtainable now for the finer sorts of Ceylon tea, to see how injuriously the competition of recent years must have affected the profits of the Indian tea planter.

Had this competition been carried on under conditions in all respects similar to those which prevail in the tea-growing districts of India, Ceylon might not have been able to outstrip her neighbour as she has done; but the circumstances of our supply of labour, of our excellent system of communication by rail, by road, by river and canal, with the short distance of most estates from the port of shipment, of our climate which permits of plucking throughout the year, and one or two other minor advantages, have aided us here most materially. Therefore it is that while we find tea cultivation in Assam and other Indian districts to be in the present day, in the case of many Companies, but a barely paying industry, the same cultivation in Ceylon, even at the low prices—relatively to those of a past era—now obtainable, is one of the most satisfactory of any taken up locally. Had we been able, now that our own planting pursuit has

passed the stage of initiatory effort and become a well-developed and settled industry, to obtain the prices which the planters of India secured but some twenty years back, the profits which could have been realized by us would have been simply enormous.

Turning from our English files, we find that the *Indian Planters' Gazette* contains tables showing the results of working, &c, for the whole season 1889, by which is meant up to end of June 1890, we suppose, of 26 Companies registered in London. These certainly shew a different result to our deduction from the interim dividends. The totals and averages are thus shewn:—

Capital paid up	£2,951,886
Total area of cultivation ...	64,953 acres
Do. mature do. ...	54,769 ,,
Proportion of young cultivation	15·68 per cent
Yield (total crop)—per mature acre	422 lb.
Outturn (*Account Sales weight*)	23,100,052 lb.
Loss iu Taring ...	[From nil to 2·37 per cent].
Capital value—per acre of total cultivation ...	£45 9s 0d per acre,

The largest total area of cultivation is 9,185 acres, of which 7,521 mature, in the case of the Assam Company. The highest yield per mature acre was 809 lb. in the case of the Dejoo Tea Company Limited; the lowest being 255. The results per lb. for the season are thus given:—

		s.	d.
Total cost *	average per lb.	0	8·42
Surplus Commission to managers	,, ,,	0	0·28
Do. Profit for shareholders	,, ,,	0	2·45
Gross proceeds	,, ,,	0	11·15
Shareholders' profit—per mature acre	...	£4 6s 1d	
Do do per cent on total cost*	...		29·06
Do do do capital	...		8·53
Dividend paid do do do		*4=Nil; 22=8·83	
Reserve Fund do do do		8=Nil; 18=9·69	

* Old non-dividend paying Companies.

The highest shareholders' profit per mature acre was £13 12s 2d. Four Companies, as shewn above, gave no dividend; one gave 18 per cent; another 15; one 14; one 11¼; 7 gave 10; one 9; one 8; 6 gave 6; one 5½; one 5 and one 2½. Leaving out the 4 old Companies, the general result of an average dividend of 8·83 per cent seems good, but there must be a large number of indifferently paying Companies outside the list.

Of course in our review of the differing aspects in which the results to the tea cultivation of Ceylon and India may be considered, we must take largely into account the fact that in very many instances of exceptionally large dividends accruing to the pursuit of that cultivation locally, the lands on which it is so successfully carried on were obtained under conditions which caused them to have been parted with for what was but little more than a nominal consideration. The collapse of the coffee-planting enterprise forced numbers of estates into the market, so greatly reducing their then purchasing value. This enabled the fortunes of the present to be largely built up upon the ruin of the past. Cases of this kind have been much rarer in India, and it is largely because of this that we contend that it would be unfair to accept instances of exceptionally high dividends declared with respect to the Ceylon industry as the standard for comparison with those of the Indian Companies. But when every allowance is made for these and the other conditions that we have mentioned, it remains evident that tea planting in Ceylon has distanced in its remunerativeness that of the neighbouring continent. Much of our relative superiority as to this remunerativeness may be assigned to the qualities inherent in our teas, which the taste of the home consumer has appreciated, and our brother planters in India have to contend against this superiority as well the local advantages possessed by us which have enabled us to produce at a lower cost.

SALE OF FOREST LAND IN HEWAHETA.

The block of forest land which formed a part of the Mooloya Estate and was advertised for sale today by Messrs. J. Auwardt & Co. was purchased by Mr. J. G. Wardrop (for Mr. R. J. d'Esterre) for R7,200, or about R46 per acre for 157 acres.

SALE OF HYNDFORD TEA ESTATE.

The Hyndford property near Nawalapitiya including Wallukelle and extending over 730 acres of which 212 are planted with tea, has just been sold by Mr. Evan Byrde as Fiscal and has been purchased for Mr. David Reid (who had taken the place of Messrs. Dent Brothers as Secondary Mortgagee) for R32,755 which we presume is the amount of the primary claim held by Mr. James Robertson, P. W. D. The estate is to be carried on by the Ceylon Tea Plantations Co., the leaf being prepared at the Mariawatte Factory,—in the interests of Mr. Rossiter and others concerned. Hyndford ought to become a valuable property under regular, careful cultivation.

CACAO THIEVES IN MATALE.

THEFT OF CACAO FROM THE YATTAWATTE ESTATE.

Mr. J. R. Martin, superintendent of Yattawatte charged one Baronchi, a lowcountry Sinhalese man with the theft of a certain quantity of cacao—ripe and unripe fruits—of the Forastero and Caracas varieties. About the 30th December Mr. Martin was informed of a man with a bag of cacao seen going from the estate. He therefore desired the headman of that village to make search and also gave him five men to assist him. On the morning of the 31st the accused with the cacao was brought to him: the cacao was about 20 lb and valued at about ten rupees. Mr. Martin did not question the accused as to how he got the cacao, as he understood from the headman that he had told him before. Having received information that a large quantity of unripe cacao had been stripped from the trees in the cacao field nearest to the accused's village, Mr. Martin visited the spot and found that a large number of unripe pods had been picked recently, also a quantity of recently shelled pods. There are no bearing cacao trees in the vicinity except a few on an estate belonging to a Parsee gentleman. At the request of the korala the arachchi of Udasgiriya, the village in which the accused lived searched the house of the accused and found the, cacao seeds placed in a hollow scooped in a heap of paddy in the course of germination, and put them into a bag. The accused told the arachchi that he got the cacao from one Peris Appu of Moragolla. Peris Appu who was called as a witness said that he owned about three or four hundred cacao trees, and that he never sells the produce in the village but sends them to Matale or Aluwihara and that he never gave the accused cacao seeds or pods.

Mr. FRASER, the laird of Wariapola, was called by the Court and said that he had had experience of cacao in Matale district for sixteen years, and that having examined the cacao produced before the Court he found that most of them were immature and that over 75 per cent were unripe.

The accused stated that it was true that the cacao was in his house as he purchased it at different rates from different parties whose names he did not know,

The following is the judgment:—"I find the accused guilty under the section of the ordinance under which he is charged. His story of having purchased the cacao seeds from Peris Appu is obviously false. He made that statement to the arachchi in the hope that he may be able to get Peris Appu to support him in that statement. But Mr. Martin has forestalled him in this. Mr. Martin sent for Peris Appu and he appeared in Court today. He has given evidence which clearly shows that he never gave or sold any cacao to this accused. The only hope accused had of accounting for the unripe cacao in his possession was to have said that he got it from a man whose cultivator the accused was and who had some bearing cacao trees. He could fee upon no other, because there is, it appears, no person in Yattawatta or Udasgiriya who could give him any cacao, for that product has not been cultivated yet by the people of those villages. Finding however that Peris Appu would not give the evidence which the accused hoped he would give, the accused in his statement gives Peris Appu up and takes refuge under an alleged purchase from unknown sellers. Obviously therefore his defence was false, he knew it to be false. His conduct with reference to the cacao he had in possession strongly proves his guilt. He had concealed the cacao in the middle of a layer of paddy seeds which had been kept to germinate.

"Theft of cacao, just at this particular time, is a very predominant evil, and it is rarely that such thefts can be detected. The offence is committed under cover of night or at a time when the watchmen are not about. I have no doubt upon my mind of the guilt of the accused. I feel bound to do all I can to protect owners of estates from the depredations of village thieves who not only steal these garden products but do so in the very heartless way in which they set to work. The crop is not only stolen but the trees are ruined and hindered from bearing.

"I find the accused guilty and sentence him to be kept at rigorous imprisonment for a term of 6 months and to receive 15 lashes.

(Signed) J. H. Eaton, P.M."

Theft of Cacao from Wariapola Estate.

B. N. Abbas, conductor of Wariapola, charged one Letchimen of Elwala with the theft of five cacao pods, worth one rupee and twenty-five cents the produce of Wariapola estate, the property of Mr. R. S. Fraser. It appears that the accused was a paid-off cooly of the estate, and since he was paid off he has been living near Wariapola estate. On the 31st December he and another boy about 12 years old were seen near a jak tree on the estate. A watcher ran up to him and found five cacao pods in his possession; they were bundled in a cloth. He brought the cacao and both of them to the complainant. In defence the accused stated that he did not pluck the cacao pods, but plucked and ate jak fruits from the estate.

The judgment is as follows:—"It is quite clear that the accused did steal the five cacao pods he is charged with having stolen. His statement amounts to admission of a theft of jak fruits, but I think the evidence makes it clear he stole the cacao too. This is the fourth case of cacao-stealing that I have been trying today. As the season for cacao to ripen is setting in, the thieves who practically live by theft of agricultural products are seen moving about under cover of approaching darkness to enrich themselves at the expense of the proprietors of estates.

"I find the accused guilty and sentence him to undergo rigorous imprisonment for a term of three months. (Signed) J. H. Eaton, P. M."

The cases were tried on the 5th January 1891.

PLANTING NOTES FOR 1891:—

Cacao; Coffee; Tea.

I. Cacao.—This is really a very paying product where the climate is suitable. The more attention and manure you give it, the more it will respond; but you must protect it from marauding and chilling winds and attend well to shade. Cacao thieving in the Galagedara district is becoming intolerable. The best way to counteract the thieving is to offer large rewards, and make it worth the while of some of the thieves to use their experience in thieving ways on behalf of the cacao planter. This causes a flutter in the thieving circles, and benefits the growers. One planter admits losing 50 per cent of his produce! I wonder what the proprietor of that estate would say. He would not grudge a good deal of money spent on rewards for thieves or reliable watchers in preference to losing one-half of his produce. The men who are robbed are:—1st. The easy-going phlegmatic office man, whose name is anything but a terror to evil-doers, and whose fields draw the most of the thieves to the advantage of his more feared neighbours.

2nd.—The unpopular man who works through conductors and English-speaking middlemen, and thus keeps the respectable villager at arm's length and utterly drives away the influential headmen whose power is great and can be made use of.

3rd.—The man whose ignorance of the vernacular and the customs of the natives prohibits him from gaining secret or stealthy knowledge so as to be beforehand with the thieves.

The man who is not robbed is the counterpart of the above, *i. e.* popular, energetic, physically and mentally powerful, feared by all yet approachable by all, just and wise in dealings with the native, thoroughly conversant with native language and ways. This sort of man will be avoided by thieves, and sought after by the better sort of villagers.

A thief will say of such a one:—"Don't rob that master, he is kind, is friendly with the headman, unmerciful when he catches us, and relentless in hunting us down. Let us go over to ——. Why, he never ascertains if the watchmen are ever watching. We can soon terrify a few Tamils even if they should be there. These Tamils are only brave when their master goes with them."

II. Coffee.—The general opinion as to this product, even the Coorg variety, is, that so many plagues are lying in wait and cacao is such a sure thing in the end; therefore plant coffee and make use of it only as a help and "lift" to the more tardy cacao which will eventually take its place. It is argued that though Coorg coffee is precocious and apt to overbear in early youth, and thus it is advisable to strip off the crops in the earlier years; yet should one sacrifice say 3 cwt. an acre to trust to an uncertain future? I say, yes. I would recommend stripping the crop entirely off the first year; and the next two years the crop before the berries turn ripe and dry it in the husk; and then you have an established Coorg coffee field which will pay better than cacao. Prune delicately and top high; in fact do everything opposite to forcing the bush. One V. A. mentioned that the crop off the *ends* of the primaries had been stripped to relieve those primaries. Had he taken the crop off the *inside* of the primaries next to the stem it would have been more sensible, but he was taking off the *fruit* he wished to relieve without relieving the branch from the cause of injury, viz.: heavy clusters of fruit at the head of the branch robbing the end of the branch of sap and vigour. Side branches of shade trees should not be cut but the general tree pruned or thinned. I saw at Matale the other day that they had cut up the side branches of fine shade trees and thus reduced objects of beauty and utility to ugly rook-resters or crow-perches. An umbrella held on a twenty feet pole will not give much shadow—and this argument is ten-fold increased when you remember that the shelter of shade is more valuable than the shade of shelter. Of course with leaf disease and green bug one has to go cautiously and avoid monoculture if possible.

III. Tea.—This is a great industry and has rapidly developed in a manner almost startling. The old painful drudgery of standing behind coolies' backs is disappearing. The new method of paying coolies by the amount of leaf, and arranging the totals in the check-roll so that the kanganies can still benefit by the coolies' work fairly, is reducing work to general inspection and careful calculation. Men (male coolies) are becoming less and less desired on a tea estate, and this alone should work a

wonderful reform among the ryots of Southern India, among whom female children have long been very much at a discount. It will recommend itself to oriental ideas, which incline largely to the idea that "women must work and men must sleep," and not "men must work and women must weep." A good plucking girl has thus acquired a new value besides that of personal feminine charms, and the ugliest daughter amongst them, if she plucks well, will soon be adorned with jewelry and sought after by the lads.

As there is such a small difference between the finest and commonest teas, it is found that fairly coarse plucking pays because the factory figures are known, and when once the average is settled say at 10d with coarse plucking, and a margin is left as profit—then the more leaf the more money. Now comes in manure. That horrible yet universal saying, "If you once start manuring you must keep it up," is really doing harm. With the past experience of our climate and its susceptibility to blights surely we should "make hay while the sun shines," and manure heavily and pluck heavily and bank the profits. The old gingerly finicking way,—aiming at appearance and tidiness and pretty teas,—that is all going out. Low pruning and topping two leaves above the fish-leaf *from any point* in the bush, not merely from level but from any sprouting point, thus drawing the bush at all its sprouting points and not allowing side branches to grow up to satisfy the leaf requirements of the plant. No—there must be no satisfaction allowed; the bush must be continually worried and plucked, always leaving first round two whole leaves above fish leaf; then one whole leaf above fish leaf—this to go on for six months. Then half a leaf above fish leaf for another six months. Then down to the fish leaf; and if you have manure you can run a second year and have the labour free for remunerative works. You must have manure, and it must be artificial manure. Cattle manure is all right for cacao or any fruit-bearing trees. We want to stimulate the leaf-producing powers, not the reproductive powers.

The moment the difference between the best teas (commercial) and the common teas becomes sufficiently marked in price and thus sufficiently attractive, then it will pay to pluck fine. Gow, Wilson, & Stanton's Sales Lists have encouraged an unhealthy competition, misleading to proprietors at home and injurious to their interests Proprietors should say to their Managers: "Give me a margin of profit, the higher it is, the greater percentage you will get"; and if the man is worth his salt he will take the best method you may depend on it.

That was a very milk-and-water production regarding COAST ADVANCES emanating from the august Association. It has a decided touch of the "Old Masters" about it, and should be respected on account of its venerable character. But it does not help us a cent. Proprietors and firms have to act and put pressure on their superintendents to secure themselves for the pressure of flushing months in the legitimate market in India. But as for myself, if I want labour and find labour to be had in the local market and am allowed to pay a good price for it, and am urgently in immediate need of it, I shall avail myself of such labour being in the market and deal with such labour for my proprietors' interests. But if I want to establish a force which, as in the old days, I could increase and decrease without robbing, or being robbed by, my neighbours, but by internal arrangements, I gradually encourage a free circulation of my coolies between their scattered homes in the arid plains of India and the clustering well-packed "lines" of a Ceylon estate, and have my labour and advance account so in hand that tundus need be neither given nor taken. It is for proprietors and firms to stop the competition in the local market of paid superintendents who are pressed by irregular and unequal calls for labour and the fluctuations of weather and special flushing periods. Places where there is much carrying of tea chests or rice, or even leaf, will suffer greatly by reason of want of labour, as compared with places favourably situated. Places where other products are cultivated, and heavy works such as holing for new clearings or for manure are carried out, these places suffer as compared with those where the only manual works are plucking, pruning and weeding. Are you then to lay down rules and issue them under the authority of the P. A. rules which cannot be applied universally? The more planters encourage the local market the more they are damaging a valuable labour supply; so the instinct of self-preservation will right the abuse so eloquently complained of by Mr. Young, so long as the proprietors and agency firms are kept awake to the danger.

It is high time the inventive genius which has developed in Ceylon so largely should apply itself to a cheap, light, effective PACKING cover for our tea. The delicate care bestowed on Ceylon packages is cruelly abused by dockers' hobnails and iron shovels; and the expensive dry air obtained by refiring and a carefully constructed factory is ruthlessly allowed to evaporate amidst the damp and smoke of a London warehouse. Then our teas are subjected to all the hurry and waste of a system of sale originally intended for sleepy China, and a comparatively small Indian trade. I believe that if a really suitable package were invented admitting ready inspection and quick and effective re-closing, and a thorough re-organization of the system of public sales made, then our teas which are the most carefully prepared in the world will get more justice and be better appreciated by the trade and the public, and thus give us more margin of profit. Strange to say the Ceylon system has elucidated the fact that an acreage over say 300 acres under tea is worked more profitably in private hands than through Companies. It used to be said that tea, with its outlay in machinery, suited the broader basis of a company with its greater division of risk, but the division of profit composed of fractional margins depends more on the excellence of the man in immediate charge than on any adopted system; and these divisions of profit are apt to be swallowed up by the various charges and the numerous necessary officials of a company.

It is admitted on all sides, that the fierce energy displayed by Ceylon in advertizing herself has revolutionized the tea trade and benefited India immensely. We want reform in the handling of tea by the Customs, and we want reform in the public salerooms. Then if blights are averted the future of the island is now sure. We grow the *drink of the universe*, the relish of the rich, the solace of the poor, a drink wholesome and harmless, and within the reach of all

SUCCESS TO CEYLON FOR 1891.

"1873."

COCONUT BUTTER.

In reply to an inquiry the following reply was sent on the subject of making butter from coconuts:—"My experiments were on a very small scale. The coconuts were scraped out with a *Karni* in the usual way, a small quantity of water added and rubbed in a mortar. The milk-like fluid was then strained through cloth and churned in a bottle. The churn used was a disc of wood of about the same diameter as the bottle, cut with a wavy edge and with holes through it, this was forced up and down by means of an upright handle. The churning was over very quickly, and the fat globules on being formed were skimmed off and washed in salt and water. The kernel which had been strained off was put into a small cheese press, and the fluid squeezed out added to the "butter-milk" and again churned, a further small quantity of butter being obtained. The cake of scrapings still retained its flavour and would be fit for various purposes. The butter was almost tasteless while fresh, but after being kept a day (in the cold weather) had a strong taste of coconut. It had the appearance and consistency of butter but was very white."

The writer continued by stating that the authorities at Kew had been asked by the Society if they could

afford information as to the manner in which coconut butter is deodorised in Germany, but they had stated that the subject had not come before them, and suggested that the information might be obtained through the Government of India; the subject being of considerable interest to India.

Mr. B. C. Basu of the Agricultural Department of Bengal, very kindly communicated the results of his experiments in the following letter:—

"I took four nuts of average size, neither very big nor very small, and had the kernel reduced to a coarse pulp with a native instrument called *Karni.* The nuts were not fully ripe; the kernel was fully formed, but was yet a little soft. After the kernel had been made into pulp, the latter was squeezed in a thick piece of cloth to express the 'milk.' A little water had to be added to the pulp to make the milk run out freely. The whole of the milk could not, however, be expressed, as I had no proper appliances to do the work. The 'milk' was measured and found to be 3 *paos* or roughly 24 oz., of which quantity 1 *pao* may be taken as water added to the pulp in the act of expressing the milk.

"Immediately after the milk had been expressed, it was churned in a soda-water bottle. I intended to use the English churn which I have recently procured from England, but the quantity of milk was too small to be put into a churn. I should mention here, that in the experiment with coconut milk which I made in the last cold weather, I had no need to add any ice or cold water, but in the present experiment which was made sometime about the end of last April, the weather was hot, the consequence being that the butter refused to 'come.' I then added a little iced water to the 'milk' in the soda-water bottle, and the butter grains immediately appeared. The whole operation did not take more than 15 minutes, and could be finished in half the time if cold water was added in the beginning. All that I had now to do was to wash the butter in cold water, and gather it into a lump. The butter weighed just a little over 1½ chittaks or 3 oz., that is 12½ per cent. on the milk. This I considered encouraging; but my surprise and disappointment were great when on opening the vessel in which I had put in the butter, I found that it had all melted and was floating on the top of the water. In the cold weather the butter kept pretty firm day and night; but in the hot weather it would be impossible to keep it solid, unless it was put in iced water. Under the circumstances, I believe it is useless trying to make coconut butter in a hot climate like ours."

In a subsequent letter Mr. Basu conjectured that the butter fats of the coconut might be of two or more kinds, with different melting points, and in that case those that melt at a low temperature might be removed and the balance would remain solid.

In connexion with the subject the following from the Journal of the Society of Chemical Industry is of interest:—

The following is an extract from the last report of the United States Consul at Mannheim on the subject of the manufacture of Coconut Butter in Germany:—

"German Chemists discovered in the coconut a fatty substitute for butter. This discovery was made by a Dr. Schlunk, practical Chemist at Ludwigshafen-on-the-Rhine. Shortly after the discovery was made a firm was established in this City under the name 'P. Müller and Söhne,' which sunk a large amount of capital in an enterprise, having for its object the production of the new article, to which they gave the name of 'Coconut butter.' The results achieved have more than justified their expectations. The firm is not able to meet the constant demands made upon it. Although in existence only one year, it employs 25 workmen, who get from 25 to 75 cents. a day, has a 40 horse-power engine, and produces daily 3,000 kilos of butter, which retails at from 55 to 65 pfennings, or from 13 to 15½ cents. per pound, or 25 to 30 cents. per killogramme.

"The nuts are obtained from almost all lands lying in the tropics, especially from the South Sea and Coral Islands, Arabia, the Coast Countries of Africa, and South America. Natives in countries where the nuts grow have for a long time used the milk of these nuts instead of food oils. It contains 60 to 70 per cent. of fat, and 23 to 25 per cent. of organic substances, of which 9 to 10 per cent. is of albumen. Liebig and Fresnius had already discovered the value of the Coconut oil, or fat, but did not succeed in its production as a substitute for butter. The new butter is of a clear, whitish colour, melts at from 26° to 28° C., and contains 0·0008 per cent. water, 0·066 per cent. mineral stuffs, and 99·9932 per cent. fat.

"It hardens at 19° C. It is better adapted, however, for the kitchen than for the dining-room, that is, for cooking purposes, than for the uses to which butter is put on our tables. It is neither disagreeable to the taste nor smell. In a country where real butter runs all the way from 25 to 35 cents., per pound, and Coconut butter costs but 15 cents., a great future must open up before the latter. At present it is chiefly used in hospitals and other state institutions, but is also rapidly finding its way into houses or homes where people are too poor to buy butter. The working classes are rapidly taking to it instead of the oleomargarines, against which so much had been said in the papers during the last two or three years.

"The new butter is said to be singularly free from acids and other disturbing elements so often found in butter, especially that made from milk taken from cows diseased with tuberculosis. Here it is estimated that fully 10 per cent. of the milk-giving cows are so troubled. This absence of acids and other matter renders its digestion much easier, hence the preference already shown for the new article by hospitals and such institutions. There are those who do not hesitate to declare this new substitute as healthier, and infinitely preferable to the too often bad butter brought on the markets, and not to be named in the same breath with oleomargarines made too often from the diseased fat of horse and sheep flesh.

"When it is remembered that Germany has already some 50 factories making oleomargarines and other artificial butters, and that some 180,000 *centners* are produced annually, it will be readily seen that regular butter will have hard work to hold its own in a hundred uses against its new rivals, and especially so since the olemargarines and artificial butters of all kinds are placed under severe, careful, and watchful State Inspectors. It is hoped, however, that no losses, but gains rather, will arise; for besides the profits resulting from the new substitutes more meat and milk, as such, will come on the markets, and consequently into use.

"If, with Köning, we assume that the principal nutriments albumen, fats, and carbon hydrates are paid for in the ratio of 5: 3: 1., *i.e.*, a kilog. of albumen costs five times, and a kilog. of fat three times, as much as a kilog of carbon hydrate, we arrive by comparison of the nutritiousness of milk with other articles of diet, at the following results:—If we pay for 1 kilog. of milk, 15 pfennigs; for a mark we get 21·33 per cent. of nutriment; for 1 kilog. lard (bacon), 172 pfennigs, 16·08 per cent.; for 1 kilog. fatty cheese, 162 pfennigs, 14·32 per cent.; for 1 kilog. pork, 131 pfennigs, 14·01 per cent.; for 1 kilog. veal, 112 pfennigs, 10·33 per cent.; for 1 kilog. beef, 128 pfennigs, 9·11 per cent.; for 1 kilog. eggs, 200 pfennigs, 4·97 per cent.

Now, if these facts are once known, milk as an article of diet will be more in demand, and the quantities no longer needed to make butter will find their way into the families where formerly pure butter was unknown, but where its substitute, coconut butter, has taken fast hold."—*Board of Trade Journal.*

ECHOES OF SCIENCE.

Geologists have proved that the diamond mines of South Africa are situated in vents or chimneys, varying from about 70ft. to 1,500ft. in diameter, and descending vertically through the schists which form the ordinary strata of the district. These vents are filled up with fragments of silicated and magnesian rocks, in which the diamonds are scattered, and

before the diggings began each was capped by a hillock, or "kopje." They are 17 in number, and run in a straight line for about 120 miles.

The question of their origin has recently been discussed by M. Dambrée, a well-known French geologist, at a meeting of the Académie dos Sciences, Paris. They have, of course, been opened by an eruptive force from the interior of the earth's crust, but they differ from the usual volcauic cracks or fissures. M. Dambrée attributes them to the outburst of imprisoned gases, and has made a number of experiments at the Laboratoire Centrale des Poudres et Salpêtres, in Paris, to prove his theory. Explosions of dynamite and gun-cotton were made in a steel cylinder or mortar, and the escaping gases made to perforate masses of rock. Limestone, gypsum, slate, granite, porcelain, glass, crystal, and steel were all fractured and bored in this manner. It follows from his experiments that gases at a high velocity, say exceeding 1,300 metres a second, and especially when aided by heat, are powerful agents of geological erosion. They are able to bore regular vents or chimneys in rocks, if there is a crack or fissure to concentrate their energy in one spot. The diamond vents of South Africa are, in his view, the effect of compressed gases exploding from the interior of the earth at certain points along a line of fissure; and the striæ or grooves observed on the sides of the vent are another proof of this explanation.

Professor Liversidge, F. R. S., of the University of Sydney, has found that certain fungoid growths have the power of removing gold from water containing it in suspension or in solution. Bottles of distilled water containing finely divided gold which had been reduced from a weak solution of the chloride by phosphorus dissolved in ether were allowed to stand for some years, and it was observed that while some of them cleared, others retained the ruby or purple colour characteristic of gold thus reduced. Examination showed that the clear bottles had a purple-blue growth in them, which, under a microscope, appeared as a mass of matted filaments. When dried over a spirit lamp, these filaments exchanged their purple tinge for the metallic lustre and colour of gold. A similar change took place when the growth was rubbed in a mortar.

In some cases the mould or fungus was white and blue-black. The white growths had a blueblack nucleus, and floated on the water. They had an oval shape, and were about ⅛in. in length. Ether or alcohol is food for such growths, and phosphorus is favourable to their growth. There was little or no fungoid when other solvents were used for the phosphorus; for instance carbon bisulphide, chloroform, or turpentine.

Professor Liversidge finds that the mould from cheese or banana skins, as well as bread and other organic bodies, will, when placed in water containing gold, either in suspension or solution, remove it, they acquiring, at the same time, the characteristic blue colour.

A French chemist, M. Aimé Girard, has shown that the potato called "Richter imperator" is well-fitted for the production of alcohol by distillation on a commercial scale. At one operation 78,000 kilogrammes of potatoes were treated, and 10 litres of alcohol, absolutely pure, were obtained from every 100 kilogrammes of the tuber. Another distillation gave 14 litres for the same quantity of roots. The "draff" which resulted was readily eaten by cattle.—*Globe.*

THE CHAMPION SWEDE CROP.—Lord Wantage has this year grown on his Home Farm at Ardington, Berks, an enormous crop of Sutton's Champion and Sutton's Crimson King Swedes, weighing just upon 40 tons per acre. The individual roots were of excellent shape and quality ,and were awarded the Champion Prize given by Messrs. Proctor and Rylands, competed for by farmers in the counties of Hereford, Salop, Stafford, Warwick, Worcester, Gloucester, Berks, Hants, Surrey, Oxford, Bucks, Herts, Bedford, Northampton and Huntingdon. Some of these roots will be exhibited on Messrs Sutton & Sons' Stand at the Smithfield Club Cattle Show next month, and will be well worthy a visit.

PINE-APPLE FIBRE.—From Mr. E. W. Dana, Lakewood, N. J., U.S.A., referring to an article on Pine-Apple fibre which was published in the Society's Journal and reproduced in the *Scientific American,* and asking if the writer could furnish him with further particulars as he is greatly interested in the subject. A small sample of the fibre was sent to Mr. Dana, and he was informed that there is early prospect of the Mauritius aloe fibre machine being tried on pine-apple leaf in India, when the results will be published in the Proceedings.—*Agricultural and Horticultural Society of India.*

OUR WEALTH OF LIVE STOCK.—Some interesting calculations of the value of the live stock held by British and Irish farmers, prepared by Mr. R. E. Turnbull, are published in the Journal of the Newcastle Farmers' Club. They are evidently founded, as far as the unmber of animals is concerned, upon the official statistics collected in June of each year. The following table shows the estimated value of the live stock in 1887 and 1889, and the increase in each case within the two years:—

Value of Farmers' Live Stock in the United Kingdom.

Description of Live Stock.	Total value in 1887.	Total value in 1889.	Increase in total value per cent.
Cattle	£100,018,452	£120,702,141	20·7
Sheep	38,417,735	50,826,357	32·3
Pigs	6,511,675	6,835,263	5·0
Horses	35,778,875	45,807,720	28·0

Mr. Turnbull concludes that the total value of the live stock of this country, including poultry and goats, was last year £227,771,481, or at the rate of £4 15s per acre, whilst in 1887 it was only £183,806,737, or £3 16s 9d per acre. The increase within the two years has thus been £43,694,744 or 18s 3d per acre.—*Bell's Weekly Mesenger.*

PRODUCTION OF GUTTA PERCHA.—The probabilities of a future scarcity of gutta percha has been a subject of concern to the French government, which accordingly sent a scientist (M. Serullas) to the Malay peninsula and the adjacent islands to investigate and report on the matter. The results of some of his labors have recently been mads public. M. Serullas states that until some substitute is discovered gutta percha is absolutely indispensible to submarine telegraphy, for other gums cannot be used for tho purpose with any practical results, as they do not possess the proper qualities. While good isonandra trees (from which this gum is taken) are to be found only in the Malaysian Archipelago and the Malaca peninsula, bad species grow all along the equatorial lands. Many efforts have been made to use the gutta percha producod from the inferior trees, but they have all failed. It has beeu found that submarine cables laid in the same waters lasted same according to the quality of the gutta percha uesd in the covering. The cause of the scarcity of genuine gutta percha is explained by M. Serullas by the fact that the Malaysian natives began by cutting all the trees as soon as they found them in a producing condition. Then, after having thus prevented the production and multiplication of the species, they attacked the youngest trees. Later on they felled trees giving an inferior gutta percha and mixed the gums, which were sold to Chinese merchants, who adulterated and weakened them still more. The extent of that blind destruction is shown by the following figures. In 1845 only 9,000 kilograms (the kilogram is equal to 21/5 pounds) of gutta percha were exported to Europe; in 1857 240,000 kilograms were exported. In 1879 the amount sent from Sumatra reached 135,000 kilograms, and from Borneo 1,300,000 kilograms. It was calculated that in order to obtain that amount the natives must have cut more than 5,000,000 trees. In view of this situation France, England and Holland in 1881 sent scientific missions abroad to study the question, and to explore the producing regions of Malacca and Malay Islands. It was discovered that it was next to impossible to find adult trees, and that the situation was nearly desperate. England caused bills to be postod prohibiting the cutting of gutta purcha trees, and Holland ordered plantations of them to be made, but the latter only produced pecies of inferior quality.—*Bradstreets.*

Correspondence.

To the Editor.

SULPHATE OF COPPER WITH LIME FOR COFFEE LEAF-DISEASE.

Bonn, Dec. 13th, 1890.

Dear Sir,—Herewith I beg to inform you that I sent on 27th Sept. 1 kg. sulphate of copper (Kupfervitriol) to my Tientsin estate in Bogawantalawa to try it against leaf-disease, and I send today 1 kg. more for further trial. For the last two years there has been a similar leaf-disease in the vines here, and the sulphate of copper (Kupfervitriol) proves a good remedy against it. I saw last September one part of vines sprinkled with this remedy and next to it one part without. On the first part the leaves were of a fine green colour and the vines healthy; on the other part the leaves were mostly yellow and drooping and the grapes tasted not so good as on the sprinkled part. The vine-owners in most places are now forced by the magistrate to use this remedy.

The composition of the remedy is:

1 kilogram dry sulphate of copper (Kupfervitriol)
1 do do fresh lime (Kalk)
100 liters water.

The 1 kg. sulphate of copper is to be dissolved alone in about 10 liters water.

,, 1 ,, fresh lime is also dissolved alone in water, and then these two solutions poured together and the required water up to the 100 liters is poured in.

The lime must be fresh, without sand. The sulphate of copper must be completely decomposed: otherwise the leaves will suffer. The complete decomposition is obtained, if the composition has subsided and litmus paper sprinkled with the composition is not coloured red, otherwise the composition must get more lime-water.

The trees must be sprinkled during dry weather, but not if the young shoots or blossom are coming out. In rainy weather the composition is washed off and must be renewed.

The sprinkling can be made twice or three times in the year: the trees will not suffer, and it is good that the falling leaves be dug in. Sound trees will not suffer by this sprinkling: sound vines here are sprinkled with this remedy to preserve them against infection.

Mr. Bremer on my Tientsin estate in Bogawantalawa can give more particulars, and as soon as I have notice from him that the remedy is successful I shall send to Tientsin a sprinkling-squirt to operate on the bark, by which one man can sprinkle in one day about 1½ acre with 400 liters of the composition.

This remedy should be tried by all planters who have leaf disease in coffee, and I believe it will be of interest for the Ceylon planters if you notice this in your paper.—Yours truly, H. SIXTUS.

[We should be glad to hear from Mr. Bremer the results of actual experiment with this somewhat potent application if it is not properly reduced by water. We believe it to be quite possible that it may thoroughly clear the bushes to which it is applied of the fungus, just as a mixture of sulphur and lime did. But we fear that in the one case as in the other, the result will be only temporary, and that while the spores exist in unlimited numbers, they will again attack the fresh leafage, the mycelium feeding on the life-blood of the plants elaborated in the leaf cells. The only real hope for the revival of coffee in Ceylon, we fear, is the gradual wearing out and final disappearance of the pest. Of that "consummation so devoutly to be wished," we fear there is as yet no decisive sign?—Ed. *T. A.*]

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TEA PACKING IN PATENT PAPER LINING.

London, Dec. 19th.

Dear Sir,—You will probably be interested to hear the result of the sale of the consignment of Elkadua tea sent home packed in the new patent paper lining.

The break in question consisted of 32 chests, 16 of which were packed in the new lining and 16 in the ordinary lead. They were put up at public auction last Tuesday, and both commanded identically the same bid. You will see by the brokers' circulars that the paper is very favourably reported upon. On arrival of the tea I went to Arthur Street Warehouse and had the packages opened before me, and in no case was there one single tear or damage of any kind. The superintendent appeared much pleased at the facilities for bulking and sampling purposes afforded by this new style of packing as compared with lead; for whereas with this latter cutting is necessary the paper is so fastened at the top and bottom of the chest that the insertion of a man's finger is all that is required to undo it without any tearing whatever.

As you may remember I tried a small break in 20lb boxes some months ago which was put up at public auction with precisely similar results as the present lot; but before bringing the matter definitely before the public I was anxious to see how the paper would succeed in the larger packages. This has now been done, and as already shown I think the result must be considered so far as one can see an entire success. It now remains for planters generally to take the matter up. They will naturally ask what they are to gain by the innovation. My answer is simple. To pack a 100 lb. chest with the ordinary lead lining costs say R2 or at the moderate rate of exchange of 1s 6d 3s 0d, while his cost of lining the same size chest with the patent paper would be f.o.b. London nett 1s 4½d

or a saving on each chest of 1s 7½d

exclusive of saving in freight &c. Surely this is good enough for most planters: it is for me. Prejudice ever has been and ever will be rife, when suggestions are made to leave the beaten track, and often prejudice proves itself in the right, and in the present instance I confess I have not been without many a question as to ultimate success—not so much as doubting the paper itself, but as to how the trade would take it. In talking to an influential grocer with a large business one day on this point, his reply was "If the tea is all right sir, we don't look much to the packing," and so I say while prejudice may be to some extent wholesome, it may at the same time perhaps be carried too far. In conclusion I can only say, that in bringing this new packing before the planters and merchants in Ceylon, I am calling their attention to an article which I have thoroughly tested myself and which I think they will find, if they try, that it will achieve the point arrived at, which is to reduce materially the price of one of the most expensive items in the cost of our tea, and that this will be done thoroughly, consistent with maintaining the quality of the tea itself.

Mr. Ambrose of Elkadua will I feel sure be pleased to afford any information as to packing &c., and consignments of the paper can be made

direct from this office or subsequently can be obtained from our Agents in Colombo.—Yours faithfully, J. M. MAITLAND KIRWAN.

P.S.—Since writing the foregoing, I have given instructions to despatch of a consignment of the paper to the Colombo Agents, where it can now be had. J. M. M. K.

CACAO CULTIVATION IN CEYLON.

SIR,—In looking over the report of the Lanka Co. I notice that their cacao estate gave a profit during the last year of about 25 per cent on the amount this property stands at in their books.

What does your correspondent "Eldorado" think of this?

I do not know what return on capital is considered to constitute an Eldorado, but I fancy 25 per cent would be considered by most of the shareholders in the Company ELDORADO ENOUGH.

SIR,—Evidently our estimable friend "Eldorado" is not interested in the Lanka Co., or he would not attempt to traverse my suppositions as to the feelings of shareholders. I have nothing to add to my previous letter on this point and nothing to retract. But does he in all seriousness expect a cacao estate not yet in full bearing to pay 25 per cent on its cost calculating this with compound interest at 8 per cent? It would appear indeed that there was a time when some such fantastic dreams floated before his heated imagination. How I wish, dear "Eldorado," that we had foregathered in those happy days of your:

"When all your geese were swans, lad,
And every lass a queen!"

We should not have been long. I'll go bail in unearthing some confiding capitalist, and this is how we would have put it, *n'est ce pas mon ami?*—"In other producing countries" (there is a judicious vagueness about the phrase which lingers on my palate; if he had remarked that the yield in Trinidad, say, was less than we stated, we would have fixed him with Venezuela or the Celebes Islands).—"In other producing countries" the average crop is not less than 6 cwt. per acre with a primitive cultivation. In Ceylon, where tropical agriculture has been thoroughly studied and developed to a point of perfection unknown elsewhere, we shall be well within the mark in placing our production at 10 cwt., which, cured as it will be with the latest inventions of our XIXth century civilization, may be relied on to fetch 100s per cwt. all round. We have, then, a gross return of £50 per acre, or allowing £5 an acre for a liberal and scientific cultivation, a net return of £45 per acre showing an income from the 500 acres property we have in view of £22,500 per annum.

"To a well-informed man like you, sir, it is unnecessary to point out that the variety of cacao chiefly grown in Ceylon is exactly the same as that in "other producing countries" and that it is entirely planted in the finest virgin soil, no old coffee land whatever having been rushed into this product so that the yield of "other producing countries" gives us an accurate basis of comparison in every way, and we have only increased it from 6 to 10 cwt. on account of the well-known advantages which our island possesses.

"There are those who will tell you that a considerable proportion of the land appearing in the Ceylon Directory as under cacao ought never to have been planted, that practically the whole crop comes from a much smaller average, and that planters in their dislike of a "primitive" cultivation made the most fatal mistakes in the early days of the enterprise—do not, my dear sir, give any credence to these malicious statements.

"In conclusion, Mr. Moneybags, we cannot too strongly urge on you the necessity of appointing two thoroughly experienced managers one for the London office and one for the estate. We believe we are in a position to name to you two parties who would be prepared for the nominal salary of £2,000 a year each to undertake the onerous duties of those posts, and we are confident that whatever your position might be at the end of a few years, they at least would find it

ELDORADO ENOUGH."

P. S.—Joking apart, if your correspondent started with some such grand ideas as the above I do not wonder that he has been disappointed, and he has my sincere sympathy. I believe however and shall continue to do to till convinced by stronger argument than he has yet advanced or by the inexorable logic and fact that a well-chosen, carefully cultivated cacao plantation in Ceylon offers as good an opportunity for remunerative investment as any other product in the island. Because mistakes have been made, which we all know is the case, is no reason why mud should be thrown at the whole enterprise. E. E.

CACAO CULTIVATION.

DEAR SIR,—Some weeks ago, one of your correspondents, who seemed to be disappointed with the results of the past few years, quoted figures from your Directory showing that the average yield of cacao was only $1\frac{1}{2}$ cwt per acre in bearing. Another correspondent, more fortunate, gave his returns as 2 or 3 cwt. per acre, but no higher figures have been quoted.

As the total exported includes, of course, all the cacao stolen from estates and sold through native traders, actual return to proprietors must be very low indeed. At a moderate computation the quantity stolen may be reckoned at ten per cent: many individual estates losing very much more.—Yours faithfully, POWDER AND SHOT.

WIRE SHOOTS.

Dec. 20th.

DEAR SIR,—"Shoot"'s letter of 10th inst. asking if "a wire shoot can be worked at a gradient of one foot in seven from point to point with a road tracer" has been drawn to my attention, and my opinion is that a shoot can be made to work at such a gradient.

If the land between the two points is of a similar gradient, in my opinion it would be necessary to have intermediate supports to carry the wire to prevent it from bagging. If the shoot is not a very long one and wanted to cross a ravine or gulley, intermediate supports would not be required.

On large tea estates where transport of leaf and fuel from a higher to a lower elevation is an expensive item, wire shoots will by-and-by, I have no doubt, become as common as spouting which was found so useful in the coffee days.

These shoots can be made to tap the different fields of the estate *en route* by a simple arrangement of shunts at the various receiving houses or turnings, so that bags of leaf and billets of wood will be seen flying through the air like miniature trains zigzag fashion from the top of the estates to the factories at the bottom. Where estates are not very steep, and as managers acquire a thorough knowledge of regulating the loads, they will, later on, where the gradients are easy, find it perfectly safe to slip the small pulley with pocket brake and cord they carry for the purpose on to the shoot, and without any exertion descend from any one point to any other of the estate along the line of wire, at the rate of 10 or 12 miles an hour.

With so many able engineering firms in the country, I have no doubt that when the demand arises for the wire shoots to do as I have tried to describe, they will be made and guaranteed to work satisfactorily.—Yours truly, OLD HAND.

ON FORKING TEA LAND:—NO. 1.

DEAR SIR,—I see no difficulty in reconciling the deep-hoeing system of Assam with the danger of the same operation on Ceylon upcountry estates. All organisms adapt themselves to their environments so long as these minister more or less to their requirements. In proportion as these are favorable the plant (in the case we are considering) flourishes, or, in their entire absence, dies. If the humus and other plant food be *equally distributed* through the soil, however

sparse, down to two or three feet, the feeding rootlets will follow it in the same degree. On nearly flat land, as I believe is the case in India, the rain moisture tends to sink in rather than flow off, and this mechanical action having been always in force has carried the solubles with it to a depth below the surface: hence the necessity for "deep hoeing" to reach the feeding ground of the plant. But where, as on our hill-sides, the true soil is all on the surface, getting thinner and thinner every year as the rain rushes rapidly off, the feeding rootlets confine themselves to those few inches; and if you destroy them all round the tree at the same time that you prune the top, only a climate like Ceylon would prevent such drastic treatment, killing the plant outright. There are roots which find their way down to great depths, as may be seen in any deep cutting; but these are generally single feelers, or explorers after food and moisture, and only develop a network of feeding-roots at their ends when they find it. This, I think, is their function; but on old coffee land in Ceylon the surface only for a few inches down is absolutely filled with fibrous roots. I have no doubt there are fields of tea in Ceylon which can be as deep-hoed as in Assam, but not on our steep hill sides without the utmost care. In this respect each field must be treated as we find it.

But our great sheet-anchor is climate. I remember years ago turning my back upon Dimbula (where just before the great coffee boom I could have bought several estates cheap) frightened at the shallowness of the soil compared to my own Uva. I lived long enough to see those estates bear large crops of coffee, and they are flourishing still. Even where all surface soil is gone, given healthy trees established and roots well covered, the climate alone will give 200 lb. an acre. But you will find all the feeding roots at the surface, and where is the cause for surprise that if these be all destroyed the tree sulks? Top-dressing would be enough if we could keep it from being washed off, and in suitable places I have seen very good results from this with no digging at all.—Yours, R. W. J.

[In the portion of Dimbula we are acquainted with, the soil is deep. We have seen the hoeing process in full operation on the hill-sides of Darjiling, which are as steep as the Ceylon mountains. In a description of work on a tea garden on the northern spurs of the Himalayas, too, we find such passages as the following:—

"Right and left the trim round bushes run in exact order, the rich brown earth turned up between them.

"Many of the coolies seem to think clothes superfluous luxuries; for they are attired in a single coat and their own long bare legs. How distinctly one can see the sinews work under the smooth brown skins, as they raise the heavy hoe high in air and then come down with a thud, detaching a heavy clod of earth from a neighbouring tea bush.

"Presently the sahib has registored the names, sounded the depth of the digging here and there, chatted with the Jemadar, and then turned leisurely homewards—leaving behind him the spruce tea bushes, the bending supple figures, all enclosed in ranges of grey-green misty hills, topped by the unmelting snows."
—ED. *T. A.*]

FORKING TEA;—NO. II.

Dec. 22nd.

DEAR SIR,—I have been very much interested in the letters about forking tea. I have little personal experience in forking, but I have a wider experience in regard to the forking carried on on neighbouring estates. I have always been against the *system* of forking *as carried out in Ceylon*; and I did not suppose that so many men of experience were of the same way of thinking. I only forked 20 acres about 5 years ago, and it threw the tea back for a couple of years. The 20-acre field was a light soil, and deep forking properly carried out is beneficial only on clayey soils. A neighbour of mine has had very marked success in forking, but the soil on his estate is largely composed of clay and he simply loosens the clods without turning them over.

The system of digging in India is quite different from that carried out in Ceylon. In India the digging is done with hoes, and in Ceylon it is mostly carried out with forks 18 inches long in the prongs, and I am of opinion that the leverage applied by forks with such long prongs shakes the bushes to their very foundations. I opine that forks with prongs only 9 inches long would show quite different results, and a light digging applied with such forks in October would conserve the rains of November and December which come in heavy plumps and 75 per cent of which is lost by running off the soil.—Yours faithfully,
J. F. R.

CACOA CULTIVATION IN CEYLON.

Kandy, Dec. 29th.

DAR SIR,—A correspondent in your Supplement of 23rd wants to know what "Eldorado" thinks of the report of the Lanka Company concerning cacao.

1st. The return of crop is under 2 cwt. per acre which in face of the fact that in other producing countries the average return with a primitive cultivation is 6 cwt., is a poor return, although above the average of this Island.

2nd. In your Directory of 1883-1884, Yattawatte estate is put down as having 435 acres of cacao in cultivation. In the last report there are only 371 acres, or a decrease of nearly 15 per cent even if no new land since then has been opened in favoured spots.

3rd. The 25 per cent profit which your correspondent takes to be the result of the Lanka Company's report, is by no means the correct one from a financial point of view which has to be worked out allowing 8 per cent compound interest per annum on capital invested. Had your correspondent the figures to make such an account he would find that he has no reason to be sanguine nor to add "enough" to ELDORADO.

COCONUT CULTIVATION BEYOND THE DEDURUOYA.

Rajakadaluwa, Chilaw, Dec. 31st.

DEAR SIR,—In your account of the coconut industry of Chilaw, there is an error which in justice to another should be pointed out. The first coconut plantation opened up north of the Deduruoya river in this district was at Sittamadam and is owned by our genial unofficial Police Magistrate and leader of the Chilaw bar, Mr. Thos. Cooke. So this gentleman is the "pioneer."—Yours faithfully,
GEORGE D. MILLER.

CEYLON TEA EXPORTS IN 1891.

Strathellie Tea Co., (Ltd.), Nawalapitiya,
Jan. 1st, 1891.

DEAR SIR,—I am today reminded of my promise to send you my computation of probable total exports of tea from Ceylon during Commercial Season, which is now made concurrent with the Calendar year.

My figures for the Fiscal Year ran, you will remember, to 52,000,000 lb. Taking 25,000 acres as giving their first returns and a reasonable increase from say 30,000 acres (mostly in the younger districts and Uva) I arrive at 54,000,000 as the figures of probable exports, thus:—

70,000 acres	at 340 lb.	per acre	=	23,800,000 lb.
45,000 "	300	"	"	13,500 000 "
35,000 "	250	"	"	8,750,000 "

30,000	„	200	„ „	6,000,000 lb.
25,000	„	100	„ „	2,500,000 „
			Total say...	54,550,000 lb.
Deducting for local consumption...				550,000 „
			Probable total exports say...	54.000,000 lb.

Yours faithfully, ARTHUR E. SCOVELL.

PATENT LEAD-PAPER.

Gartmore Estate, Maskeliya, Jan. 2nd.

DEAR SIR,—Allow me as representing the owners of "Clark's Patent" lead paper to reply to your editorial on the subject of Lead Lining for Tea Chests, appearing in your issue of 30th ulto.*

The reports that you say have reached you regarding the satisfactory results of shipments of tea made in "Clark's Patent" lead paper are correct, and I would ask you still further to suspend your judgment until I am enabled to find out who has been using worthless imitations. This paper lead has been protected by the Ceylon Patent No. 323 of 1889, and the application of it as a lining for tea chests &c. by the United Kingdom Patent No. 9,099 of 1889. I have a list of the shipments of tea made in chests lined with this material, and in no single instance has any fault been found with it, but, on the contrary as the enclosed list of testimonials will show you (from utter strangers to the patentee and from leading brokers in London).

All the "Clark's Patent" lead paper hitherto used has been prepared in the island, and *from Messrs. W. and R. Johnston's Tea Lead ordinarily used for packing tea*—none of it having been under 4 oz. weight. If your London correspondent's statement as to the perforations he noticed in one sample shown him, is correct, I shall feel obliged if he will furnish me with further particulars regarding the parcel of tea in which it was used. In his previous letter, however, I think, he made no mention of the lead having been lined with paper, or I should have taken notice of the matter at the time.

It must not be accepted as a fact, what your London correspondent only gives as an opinion of a London tea taster. His statement is ambiguous; but if he infer that the sample of tea referred to was packed in Clark's Patent Paper Lead, I challenge the correctness of his opinion. I should be glad to know more about it, the name of the estate, and the vessel it was shipped by.

Your London Correspondent after condemning all paper lead linings for tea chests proceeds to describe a "new discovery" as follows:—"The working of it is of quite a distinct character from that of all the so called lead paper, hitherto tried. There are manifestly, from their feel, of paper coated only with lead, while this is equally manifestly of lead, only lined with paper. There is therefore a very sufficient and capable distinction to be drawn between their respective characteristics." The above is a very fair description of "Clark's Patent" Lead Lining! In the specification of the Patent the description runs:—"a lining of paper, cloth, calico, or similar material, or one or other of the combined &c., &c., to the lead used in packing tea." From the above you will see that your correspondent has had worthless imitations brought to his notice. Clark's Patent paper lead is manifestly dearer than the ordinary lead, being made from it, but it can be prepared at very little extra expense, and the advantages of it are beyond doubt. The lining is considerably strengthened, and not so liable to be damaged when packing the tea, or afterwards in bulking or sampling in the bonded warehouse at home. It further preserves the tea, and also prevents the actual contact of the tea with the lead which is considered by many medical men injurious to health. So convinced am I that the lining is a success, and a real gain over the trifling cost, that not a single package has left my factory not lined with it. Two sample boxes packed and kept in store for a year were, a short time ago, sent to Messrs. Gow, Wilson & Stanton for their report &c. They reported that it arrived "in excellent condition" and sold for 1s 5d. and 1s 4d. per lb. respectively. The parcel of Gartmore tea which sold for 10s 6d. per lb. in London, the other day, was similarly packed.

A shipment of the lead paper has been received from England, by the agents of Clark's Patent, the Colombo Commercial Company, Limited; but it has been so badly prepared, and packed, that it has been withdrawn from sale. Suitable paper, of the correct width and any length, can be procured from the Colombo Commercial Company, Limited, and authority to use it or lead of sufficient thickness and good quality,—Yours faithfully,

T. C. ANDERSON.

* See page 541.—ED. T. A.

SULPHATE OF COPPER FOR COFFEE AS RECOMMENDED BY MISS ORMEROD.

SIR,—Can you or any of your readers inform me through your columns, where this can be purchased in Ceylon and what its cost about is?

Also how it ought to be applied to coffee suffering from green bug and what season is the best—in sunny, cloudy or rainy weather; also if it should be applied just before the attack is renewed or only after it has made its re-appearance—*i.e.* is it simply a deterrent or a *potent extinguisher*?—Yours faithfully, O.

P.S.—There are fine fields of coffee in Haputale, and every effort should be made to preserve them—who shall say if they will not eventually prove the nucleus for a renewal of the coffee enterprise in the hill districts of Ceylon. I could instance at the *present moment* one case of a field of over 100 acres bearing at the rate of cwts. 8 (eight) per acre. How will this compare with profits from tea at its best, say with Mariawatte 100 acres?

[This Uva correspondent will find some of the information he wants in Mr. Sixtus's letter on page 573. Certainly, every effort should be made to fight the enemies of the good coffee remaining in the country. Let our correspondent work out the profit-reckoning between coffee and tea in bumper crops and send us the result.—ED. *T. A.*]

TEA LEAD *VS.* PAPER LINING:

January 10th.

DEAR SIR,—Mr. Maitland Kirwan in his letter advocating the use of, or a trial given to, his "patent" paper, starts on the supposition that the ordinary lead used, costs on the estate R2 per chest or 3s stg. as against his paper costing 1s 4½d in London, or a saving of 1s 7½d per chest.

My last purchase of lead was one box at R13·50 per cwt. in Colombo. 5 oz. lead which is now generally used in preference to 4 oz. lead, gives 28 sheets to the cwt., or at above price costs 48 cents per sheet. It requires a little under 1½ sheet to line a full chest 24 by 19 by 19 (outside measurement), so that the lining with 5 oz. lead costs in Colombo 72 cents. In England I have no doubt, 5 oz. lead can be had under 15s per cwt. f.o.b.

but taking it at that price, the lining would cost 9¾d per chest, as against Mr. Maitland Kirwan's paper at 1s 4½d. This is not good enough for Ceylon planters. However, it may suit the inventor.

Your proposal to have a Committee of the Planters' Association to enquire into inventions and new processes in the manufacture of tea, &c. is an excellent one, and I trust it will be adopted. The Committee should first of all agitate for a reduction of the cost of Patents. At present it is prohibitory.—Yours faithfully, PLANTER.

COFFEE LEAF-DISEASE AND SUGGESTED REMEDIES.

Bombay, January 7th.

DEAR SIR,—I have read in your paper of November 15th a letter from Messrs. W. and A. Gilbey under the heading of "Enemies of Coffee and Remedies,"* recommending solution of sulphate of copper as the best means of destroying the pests which beset the trees.

The remedy suggested is certainly an effective one, but the method of applying the solution is so expensive and difficult that few would resort to it on coffee estates which are hilly and steep.

If 30 gallons of this solution are necessary on an acre of vines, it would, at the rate of 2 gallons per tree, necessitate about 2,400 gallons on an acre of coffee. Application of the solution by means of a force pump would cause a deal of wastage, for in order to saturate a whole tree efficiently 2 gallons of the solution would not count for much.

What is necessary is a simple and inexpensive remedy that would lay hold of these pests and exterminate them. To find this out I have been trying different modes of destroying them, viz.: 1 by solution of gum arabic, 2 rice starch, 3 pipe clay, 4 black clay, 5 Mooltan clay and 6 red clay. Each of the last four substances was by itself mixed with water and made into a paste. A paste of each of these four was also separately prepared with solution of gum arabic and rice starch, making in all 10 sorts of pastes. To test the adhesive properties of these pastes, I applied each of them (with the finger), on leaves of different sorts, gathered in a flower garden, and while watching the process I found that each leaf after about three hours of application began to curl up, and cracks became visible half-an-hour later in the surface of the paste applied which fell off in pieces on mere touch, leaving no trace of it on the leaves, which resumed their former shape immediately after. The result arrived at in all the ten cases being the same, I would recommend the last of the ingredients, *i.e.*, red clay, which can be had in large quantities from every coffee estate without any outlay. The clay should first of all be rid of all sand and gravel which it is generally found mixed with, and then made into a paste of thin consistency say that of oil paint ready for application, and applied on the back of the leaves gently with the finger, taking care not to rub it hard.

I may state that the experiments I tried were on healthy leaves, and not on those attacked with the bug or other disease, as I could not procure any of such; but I believe the paste, if it is applied to leaves attacked by the bug &c., would fall off sooner by the movements of the insects which they would be forced to exercise. To prevent this early falling-off of the paste, country soap soaked in water to form a paste of some consistency, and mixed with equal part of red clay paste, would answer well, and adhere to the leaves for about 6 hours. An application of simple soap paste minus the red clay would also give the same results, but for the sake of economy I would recommend a mixture of both soap and clay paste.

Red clay should be prepared for paste by soaking it in double its quantity or more of water in a large tub, and let it remain for a time without stirring. It is to be well stirred with hand afterwards, and filtered through thin cloth, and allowed to settle, which being accomplished the water is to be gently drained off and the residue will be the paste required.

The country soap I have alluded to is imported into Colombo from Negapatam and can be had in the bazaar. Large tubs and galvanized iron buckets are the only expensive items necessary for the purpose, the rest being manual labour which any efficient estate manager would be able to furnish himself cheaply.

I have forwarded through a friend, who left here for Colombo on the 2nd instant, two packets to be handed over to you, one containing samples of the different sorts of clay and soap, as well as soap and clay pastes; the other two leaves, one anointed with soap paste, the other with soap paste and clay combined. These packets should have reached you by about the 6th inst., and the adhesiveness of the paste on each of the leaves must have been observed by you.

If these applications do not prove of sufficient efficacy to destroy the bug, &c., I would recommend a strong solution of alum (which is cheaper and not dangerous to handle as compared with sulphate of copper), to be added to any one of the two pastes I have above described. What the strength of the solution of alum should be I am not in a position to state, and leave it to the experience of those better able to form an idea on the subject. Alum could be procured in Bombay at about R4 a cwt.—Yours &c., K. H.

[This letter, the experiments recorded and the substances of which specimens have been sent are interesting, but surely our correspondent cannot be serious in writing of the application of clay, starch, soap, &c., by hand! The expense would be prohibitory. The difficulty in regard to scale insects, and especially in dealing with the coffee fungus, does not arise from inability to kill the pests actually on bushes. The problem to be solved is the extermination of the insect eggs and the fungus spores. The soap and the clays can be seen at our office.—ED. *T. A.*]

* See page 461.—ED. *T. A.*

CACAO CULTIVATION IN CEYLON.

Kandy, Jan. 14th.

DEAR SIR,—Your jocular correspondent "Eldorado Enough" asks in your issue of 8th.* "But does he ["Eldorado"] in all seriousness expect a cacao estate, not yet in full bearing, to pay 25 per cent on its cost, calculating this with compound interest at 8 per cent?"

Let me put my answer on a firm basis, for he seems disposed to pierce it with his wit. Being given an estate of upwards of ten years old, of which 15 per cent has gone out, I do expect it to give 25 per cent on the actual capital which has to be rapidly amortized, considering the great many blanks there are in the lottery called "cacao cultivation."

Would the facetious "E. E.," if the coffee enterprise, starting under the same conditions as he surmises that I based my calculations upon, had obtained the results he mentions—would he, I ask,—have had the audacity to suggest his receiving £2,000st. as the family physician of Mr. Moneybags?

No cultivation, except rubber, has offered such disastrous results in this island as

* See page 574.—ED. *T. A.*

that of cacao: after six most promising years during which the trees flourished under all conditions, a sudden mysterious scourge as bad if not worse as the coffee disease has devastated the most flourishing plantations, destroying one-third of the trees and leaving the balance in such a lingering condition that the very small average production in place of rapidly increasing has remained stagnant and has been reduced last year by 3,000 cwt.

If the crop comes from a much smaller acreage as the humourous "E. E." asserts, the amount of land which the scourge has laid bare is increased, which does not better the aspect of the cultivation.

Ingenious "E. E." has forestalled my intention, but leaving Trinidad and the Celebes apart, does he know that the crop of the Puerto Cabello* District in Venezuela, chiefly sold in France and Spain, comes up to the average I mentioned (6 cwt.) as also the one of the Catholic Republic of Ecuador, the export of which has varied from 310,000 to 340,000 cwt. a year for the last decade, besides the local consumption which is very general amongst the one million inhabitants of Spanish descent.

The pleasant "E. E." speaks of the "fatal mistakes in the early days of the enterprise." If he would clearly point these out to his ignorant brethren they might get up a subscription perhaps equal to the snug sinecure of £2,000 for which he hankers.

"Ne faut-il pas essayer pour réussir?"

If exposing blunders is synonymous to throwing mu', I prefer doing this than to bolster up a languishing industry to make it appear an

ELDORADO.

[Does our present correspondent not allow that Ceylon planters of cacao having discovered the proper management of shade, are in a better way now than some years ago? We were recommended the other day to visit Gonambil as an example of the great improvement effected in cacao plantations.—Ed. *T. A.*]

TEA LEAD *vs.* PAPER LINING.

January 16th.

SIR,—I do not want to find more fault with "Planter" than I can help, because he has done us a service in commencing the ventilation of this subject. His quotation of Colombo price of lead however at R13 50 per cwt. is not quite fair. I paid last month R300 for a ton, and see that another firm charged R310 for the same lead mentioned by "Planter." This would make 83c per chest instead of 72c. A committee of enquiry into inventions would be of great service. B. L.

TEA IN ASSAM.—At the close of last year the number of tea gardens borne on the District registers in Assam was 868. The number of gardens opened during the year was eight, and three were removed from the registers, of which one was closed and two amalgamated. The area of land held by tea planters is said to have increased from 955,499 to 1,000,665 acres. This increase, appears to have been largely due to revised figures of area having been submitted by some gardens, and it is impossible to tell what the real extension of tea planting amounted to.—*M. Mail*, Jan. 6th.

* The apostle of Tropical Agriculture "Peppercorn" who occasionally imparts instruction to the Ceylon planters, recently wrote under a misapprehension that the earthing of cacao was easily detected in the market and considered a fraud. It will surprise him to learn that this highest priced cacao is always unmistakably earthed. In France and Spain I know the earthed kinds generally to be preferred by manufacturers. In Bordeaux the price ranges from 175 to 190 frs. per 50 kilos of the Puerto-Cabello cacao at the public sales. (£7 to £7 12s. per cwt.)—E.

HYDROCHLORATE OF COCAINE.—The Madras Government is not at present prepared to institute any experiments in the manufacture of this article as suggested by Dr. Macnamara.

COCONUTS AND CINNAMON.—Kadirana, Jan. 3rd.—There has been no rain since the 12th of last month, and a nasty dry wind is blowing, inducing colds, fevers, rheumatism and aches generally. This state of things and a bud with blossom just appearing, makes peeling of cinnamon difficult. Some estates have already stopped work and the others will soon have to follow. The rainfall for 1890 is 53·46 inches, being 31 inches less than the average for the previous four years. This does not look well for cinnamon and coconut crops next year; and both I fear are bound to be much below the average.

THE PROFITS ON CATTLE SPICE.—The profits from the manufacture of cattle food, as shown in the prospectus of a well known Cattle Spice and Poultry Food Company, are almost on as liberal a scale as those drawn from patent medicines. A business which manufactures a ton of stuff for £6 6s 4d, and sells it for £27 9s 2d, is the sort of thing everybody would like to be in. But, apparently, the opportunity is not to be given to many to share in the profits, for, though £60,000 of the capital of the company is nominally offered to the public, more than half of it is to be applied for by the directors and their friends.—*Financial News.* [The above we reproduce for reasons which will be obvious to the reader. Such profits are extortionate.—S. D. & Co.]

UTILIZING THE POWER IN WATER MAINS.—The New York *Engineering Record* says:—"J. Gibson, of Ayr, Scotland, proposes to utilize the power in waterpipes under pressure by forming a by-pass or junction with the water main, through which the whole or any part of the water in the main may pass. In this by-pass is placed a spiral motor, the spindle of which projects through the elbow of the by-pass, so that it can be connected to a machine, to be driven without any loss of water. It is proposed to place suitable stop-valves in the supply-pipe and by-pass in order to regulate the quantity of water passing through the by-pass, and also to permit of repairs to the motor being made."—*Bradstreet's.*

BINNY'S COFFEE WORKS.—There is no localised centre of industry so busy at the present than the well known and long established Coffee Curing Works of Messrs. Binny and Co., situated close to the Cantonment Railway Station. Operations are in full swing just now, and the inside of the buildings afford a pleasant and practical illustration of successful work carried out in a systematic and well conducted manner. Coffee from all parts of the Mysore Province—and outside too—is pouring in, and the various provisions of drying, peeling, sizing, sorting, garbling and packing for the home market are carried out with a precision and arrangement, entailing an order and supervision, which reflects much credit on the establishment. Many years' experience in these matters have led to the introduction of many improvements in the machinery and the internal arrangements of labour which have resulted in the curing from Binny's Works being classed among the best seen in the London Market, and Mysore coffee has during the past seasons maintained selling figures which must be very encouraging to all concerned The coffee works give employment during the season to over one thousand hands, and from the liberal treatment accorded to the operations, we believe, that while it is sometimes difficult to get labour in the open market the coffee works never experience a dearth of hands.—*Bangalore Spectator.*

LORD DERBY ON TECHNICAL EDUCATION.

The annual meeting and distribution of awards of the Liverpool School of Science and Technology took place on September 25th in St. George's Hall, under the presidency of the Mayor (Mr. Thomas Hughes). There was a large attendance.

The Chairman mentioned that Lord Derby had given further evidence of his interest in the school by giving £200 to provide two more special prizes.

Lord Derby, who handed the awards to the successful students previously, delivered an address on technical education. He said—Gentlemen,—You have asked me to attend this meeting and to deliver the prizes earned within the year. That is a duty which I undertake with pleasure, because, having watched from the beginning this School of Science, and I may add, having been one of the earliest contributors to it, I am satisfied it has done good and useful work in the past, and that it is capable of doing much more if only adequate support be afforded. It has lived as yet less than 30 years since its foundation, in 1861. Its progress has been steady and not slow. From 28 students in 1865 the numbers have steadily increased to 905 at the present date. In all since the opening it has been attended by 12 916 students, and the total cost has been £26,700, being an average of £920 yearly. I am told that our students have been mostly, though not exclusively, taken from the artisan class. Of the practical results of the school we have no cause to be ashamed. It is never possible to state them in an entirely satisfactory way, because the exceptional success of an individual here and there proves less in favour of the training which he has received than a high average of attainment which does not so easily admit of evidence in a statistical form I am told that very many of our students are employed in all parts of the world as marine and civil engineers and builders; that the winners of the prize which you have been kind enough to call by my name are nearly all in responsible and important positions. One is a manager of the Mersey Forge. One is an expert in the Patent Office. One is an architect and surveyor to the Board of Works in London, and others are in various capacities which I do not state to you in detail, because the list would be too long. The school has suffered, like most institutions, from "that eternal want of pence which vexes public men." I am told that its space is utterly inadequate, and that increased accommodation is urgently required. But there is some comfort, on the other hand, to be found in the prospect that when the Technical Instruction Act is in operation, as it is expected to be, the corporation will come to its assistance, and meet what is no doubt an increasing and urgent popular demand. (Hear, hear.) Of the practical utility of a school of this kind you have heard enough, and it is needless to prove what nobody doubts. The necessity of technical instruction, if our workmen are to hold their own against foreign rivals, is a common place of the platform; but we must not forget that there are other objects to be served, less pressing—some would say less practical —yet in their ultimate results surely not less important. You will not expect from me, who can claim no relation to science, except that of a respectful admirer and in some very humble degree a student, a disquisition on the use and value of scientific training; but some facts are clear, and need no special gift of observation to detect them. Ours will be remembered as pre-eminently the age of science, I might say throughout the civilised world, but more especially in England. In literature our age has done well, but we can scarcely, perhaps claim to rival the generation that gave us Shakespeare and Bacon. In politics we cannot judge the work of our time. We are too near it, and we have not seen the end; but the changes of our day, many and important as they are, can scarcely be set alongside the Reformation of the 16th century, or the civil wars and revolutions of the 17th. I speak here not as judging any of these movements, but only as weighing their relative magnitude and importance. In regard of wars and of conquests, happily we have little in the last 50 years to look back upon. But the triumphs of applied science in our day are the veriest commonplace. To dwell upon them would be absurd, and in such matters one success leads to another. More than that, spread as civilisation is over the whole earth, there is no fear of such a reaction of barbarism and ignorance as that which followed the decadence of the Roman Empire. Whoever wishes to see an admirable summary, at once concise and comprehensive, of scientific progress in the last half century will find it in a little volume by Sir John Lubbock, published this year, which has no fault except the rare one of too great brevity. In this one respect I think we may praise ourselves without fear of seeming ridiculous to the next generation. Our successors may excel us as writers, as politicians, as soldiers; they may surpass even the industrial energies of the present time, but it is not likely—it is scarcely possible—that in the region of science, the 20th century should witness advances greater than, or as great as those of the 19th. (Hear, hear.) The general experience of the world hitherto has been that brilliant but brief epochs of advance have been followed by long intervals of stagnation, and sometimes even of retrogression. Retrogression is not likely, as I said just now, but stagnation is quite possible. There is one phrase much employed when people talk on these subjects, which, to my mind, contains a fallacy. I mean the common phrase of popularising science. Now, to popularise science is simply impossible. You may give everybody an opportunity of learning, but not everybody will or can take advantage of it. You may popularise the results of science, but that is quite a different matter. As an old saying runs, there is no royal road to mathematics. Anybody could cram up, with the help of an average memory and of easily-acquired handbooks, a summary of what has been done in astronomy, in chemistry or other science, but when that result is accomplished he will be very little nearer to any real gain which science could bring to him. It is only labour and perseverance, added to natural capacity that can give a scientific mind. Fortunately, not everybody is required to have it. I have no doubt a man may be a good workman, a good clerk, a good man of business, and discharge all the duties of life in a satisfactory way, although he believes that the sun goes round the earth and that the moon and stars are lighted up at night to enable mankind to see their way. We cannot all be what the hideous slang of the day describes as "scientists," any more than we can all be poets; but I think the answer was a good one which was given long ago to the objection, "You want to make your pupil Jack of all trades, and master of none." "No," was the reply, "I want him to be Jack of all trades, and master of one." Nobody is required, nor, indeed, is it usually possible to make a serious study of more than one profession; but, just as it is good to have a taste for books, though we may not wish to become authors, and to have a love of pictures, though we may never intend to paint, so it is desirable to have a

sympathetic insight into studies alien from our own. Time is not wasted in that way, for there are very few people a good deal of whose time does not run to waste, and when they talk of want of time, it is really, nine times out of ten want of energy that they mean. No doubt, much labour is monotonous and wearisome, but those who have tried the experiment will tell you that, given a reasonable degree of bodily health and mental activity, the best repose from monotonous labour is to be found in change of occupation, not in absolute apathy and vacancy (Hear, hear.) and there is one reason why, in my judgment, some tincture of scientific knowledge is desirable for every educated person. The result may not be great, but the process is valuable. An entire absence of the scientific spirit is no doubt compatible with brilliant talent and high distinction. You do not find fault for a deficiency of that kind in a novelist a poet, or a writer of light literature, but it is a deficiency notwithstanding. If you ask me what I mean by a scientific spirit, I think I know, but I must confess that it is more easily described in vague and general terms than precisely defined. I mean by it, in the first place, a habit of accuracy and exactness in matters of fact. It matters very little to an orator that his facts should be carefully verified—sometimes he is wise in abstaining from the attempt but a calculation or an experiment must inevitably fail if there is a want of accuracy anywhere. In the next place, I mean that temper of mind which seeks for conclusions, but does not jump at them; which is equally opposed to the stupid incredulity of ignorance, refusing to accept any idea which is not familiar; to the reverential credulity, which accepts as true any statement coming down from old or high authority; and to the careless indifferentism which, so long as a theory looks and sounds well, and especially if it flatters some previously existing feeling or prejudice, does not care on what foundation of reality that theory rests. (Cheers.) Ours is an age when the half-educated are a power in the world; when more men than ever before reason and speculate on difficult matters, and when, consequently, there is all round us and on all subjects a quite bewildering amount of loose talk and inconclusive argument. (Hear, hear.) More than that there are fashions in opinion, and you constantly hear it said, "Oh, yes, that was the way people reasoned 20 years ago, but it is quite out of date now." Well, such fluctuations must exist in what are called practical affairs, but that is all the more reason why it is good to have to do with theories that cannot go out of fashion, and with trains that are absolutely incapable of being affected by the ebb and flow of what is called public opinion. Else we should be apt to rest in the conclusion that nothing is true and nothing false, and that the best thing to do is simply to accept the current ideas of the day, which, indeed, from the point of view of personal interest, very likely for most people is the best thing. That the world is governed by laws which we did not make and cannot abolish—laws which will operate whether we recognise or ignore them, and which it is our wisdom therefore to study that we may obey, and in obeying utilise them—that is what I take to be the outcome of scientific teaching (cheers), and if anybody thinks that a useless or an unimportant or unnecessary lesson I do not agree with him. (Hear, hear.) Something else science, rightly understood, will teach us to know—what it is that we can hope to know and to understand; and to recognise how little that is, and how much lies, and probably always will lie, beyond the reach of our faculties. One word only I will add—that, having known men of many professions, I should say, as far as my observation goes, the happiest lives are those which have been devoted to science. Every step is interesting, and the success of those who do succeed is lasting. What general, what orator, what statesman, what man of letters can hope to leave a memory like that of Darwin? An invalid in health, a man who seldom stirred from home, a man until his later years very little known to the outer world, but who, from his quiet study, revolutionised the thought of Europe, and will be remembered as long as Newton and Bacon. If fame be ever worth working for—I do not say it is—that kind of fame is surely, of all, the most durable and the most desirable. (Cheers.) Well, I have perhaps digressed from our proper subject, for it is not likely that we have a future Darwin in this room, but it is no exaggeration to say that, as a rule, no man who has taken to science as the work of his life regrets the choice, while men who have done important work in other lines feel like Renan, who, at the height of his literary eminence, tells us in his autobiography that he has often regretted that science, rather than historical research, had not been the object of his early pursuit. Nothing remains for me now except to offer to this school of science my sincere good wishes for its future prosperity, and to you, the successful students who are attending here to receive your prizes, my congratulations on the good beginning which you have made, and my hope that neither early success nor possible temporary failure may induce you to desist from those steady, unhasting, unresting exertions without which the great prizes of life can never be attained. (Cheers.)—*Pioneer.* [There is so much that is good in Lord Derby's address that it is the more to be regretted that he should have held up for admiration two men like Darwin and Renan, the first of whom did not think Christianity worthy of the same examination which he instituted regarding the phenomena of the physical world, while the other, most unnecessarily introduced, has devoted his life to destroying the faith which is the light and the hope of the human race, and will remain so when Renan is forgotten.—Ed. *T. A.*]

The Coconut trade of Tahiti is a growing one. Notwithstanding the destruction of many of the palms by the storm which raged over all the islands of the Pacific last season, and the blight which attacked the fruit there is an immense excess of production over last year's crop with a ready market for the fruit, either fresh or as dried copra.—*Mildura Cultivator.*

The Bengal Iron and Steel Company are proving what success can be gained by private enterprise in developing the mineral resources of the country. When they took over the concern from the Government of India there were two blast-furnaces on the old-fashioned "open-top" plan. A third and larger blast furnace of better design and with all the recent improvements which can be thought of is now being erected. When this new furnace is completed it is intended to remodel the old ones. The Company are also putting up two new blowing engines and in other respects making the blast-furnace portion of the works equal to meeting modern requirements. The foundry is being extended with a view to the manufacture of cast-iron pipes suitable for waterworks, which are now being so widely carried out in many cities. The management are showing such energy and enterprise that the Government must congratulate themselves on having practically entrusted to the Company the task of developing the native iron industry of India.—*Pioneer.*

IS SULPHUR TO BE FOUND IN CEYLON?

The above query is put to us by a correspondent who tells us he has searched the Import and Export tables given in our Directory for any mention of sulphur in vain. He further adds that as he finds brimstone to have a place in those tables, he conjectures that our import of sulphur is generically included under that heading. If this be not the case, he says, he is at a loss to conceive whence the supply for the local demand for the article is obtained, and he asks us if we can inform him whether there is any local production of it from which this apparently obvious demand can be met.

The only instance known to us personally of sulphur being found in Ceylon is that of the well-known hot wells at Bubula on the Badulla-Batticaloa road. These springs are distinctly sulphurous, the yellow crystals forming in abundance around their edges; but we have never heard whether these are collected, or, if they be, whether they have been so dealt with as to form an article of trade or commerce? Now it is certain that in one form or another sulphur enters largely into the daily uses of civilization. It is one of the main components also of gunpowder, and we fancy, though we do not feel certain on the point—that we have read that in earlier times, before the introduction on a large scale of this explosive from Europe, the natives used to manufacture the coarse powder they employed for themselves. If this was the case, there is every probability that the sulphur required for the preparation was obtained from local sources. Even in regard to India, we learn from our own compilation of "Gold, Gems" &c., that the sources of sulphur are limited in extent and only sufficient to meet local demands. "They are chiefly connected with the occurrence of hot springs." Whether therefore the sulphur now required locally be imported under the head of "brimstone" or not, it is certain that, to some extent at all events, sulphur in its natural state is to be found in Ceylon. As we have said, but one locality is at present known to us where it may be found; but even this solitary instance is a sufficient ground for the assumption that it might be found more widely diffused. Geologists tell us that wherever igneous rocks are to be found, wherever there exists traces of a past volcanic action, sulphur is sure to be more or less present. If this be the case, it is certainly singular that hot mineral springs are not to be found more commonly in Ceylon than is generally known. The knowledge possessed on the subject of local deposits of sulphur seems to be extremely restricted; Tennent scarcely refers to it, and yet the consumption of sulphur in any modern community must be large. Whence then is the supply for our local demand for it met? We have cited proof of its existence in Ceylon, and it might well be that some discussion of the matter would tend towards the creation of an industry concerned with its collection and preparation. Does the residuum found in our salt-collecting pans ever show traces of sulphur? We have always understood that it is more or less present among the impurities of rock salt, but are unaware if it be a constituent in that obtained by the evaporation of sea water. Probably some local scientist would be able to throw light on this part of the subject. The chief source of European supply we believe to be from mines worked in the neighbourhood of Mount Etna in Sicily, an active volcano certain to bring the article to the surface. But it must exist in many other places, and the only question is whther in such localities it is at so great a depth as to be

commercially unworkable. The springs at Bubula before referred to at all events bring it in considerable quantities to the upper levels, and those springs are scarcely likely to be the solitary intance to be found in Ceylon.

IRRIGATION AND ARTESIAN WELLS.

The following is a communication from one who has spent some years in the N. C. Province which, since its formation by Sir William Gregory, has shared very largely in the Irrigation vote.

"After the recent experience of the comparative failure of several large Irrigation works lately restored, any sensible man interested in the welfare of the colony, should protest againt the Government undertaking any further expensive works, the success of which depends entirely on rainfall, which, it need hardly be said, often proves to be precarious and disappointing. It is admitted that all the stupendous tanks in the Island were once in splendid working order and had under each of them a teeming population quite happy and contended with their lot. The question is how these tanks fell into disuse, and eventually into dis-repair. Undoubtedly a drought continuing for a series of years was the cause of their ruin and desolation. People who once thought their position happy had to migrate to other parts of the Island where they were provided with an unfailing water-supply; and this was how certain tanks were abandoned, neglected and desolated. Who will now guarantee that, in the case of the tanks recently restored by Government, a like failure and abandonment will not occur. To provide against such a contingency is the imperative duty of a paternal Government; and the only feasible means of effecting this seems to me to be by boring artesian wells to serve as feeders to these tanks. A cheap apparatus for boring purposes can now be had for R3,000, and the cost of sinking a well will be very inconsiderable when compared with the enormous expenditure incurred in the restoration of "giant" tanks. In view of these circumstances, it is to be hoped that the Government will make a start in this direction without delay. An experiment may be made in the case of one of the tanks in the Northern or North-Central Provinces. There is, I believe, a vote of R9,000, allowed in the Supply Bill for 1891, for experiments with regard to Artesian wells.—"Jaffna Patriot."

A PEPPER SHIPMENT.

In the Probate, Divorce, and Admiralty Division, before the Right Hon. the President, Edward Boustead & Co. and Edward Pink & Sons *v.* the Owners of the ship "August" was an important case heard on Saturday, involving points of interest to traders and merchants, more particularly to dealers in Eastern produce. Mr. J. G. Barnes, Q. C., and Mr. F. W. Hollams appeared for the plaintiffs; Sir Walter Phillimore, Dr. Raikes, and Mr. Arthur Pritchard represented the defendants. The statement of claim, which was delivered on February 12th, 1890, set forth that the plaintiffs had suffered damage by breach of the contracts set forth in five bills of lading of goods shipped by or on behalf of the plaintiffs, at Singapore, on board the defendants' sailing-vessel the "August," and consigned to London. The bills of lading were dated May 14th, 1889, and were respectively signed by the master of the said vessel as the agent for the defendants. The non-delivery of 1,094 bags of pepper-part of the cargo shipped in the said vessel, and included in the said bills of lading, was the breach complained of. Alternatively, the plaintiffs alleged that they had suffered damage by the defendants, their servants and agents, wrongfully depriving the plaintiffs of certain goods, to wit, 1,094 bags of pepper delivered to the defendants by or on behalf of the plaintiffs, to be carried in the defendants' vessel the "August," from

Singapore to Loudon. The particulars of the damage were as follows:—1,094 bags of pepper, weighing 70 46 tons. at 6d per lb. arrived value 3,945*l* 15s. The plaintiffs claimed (1) 3,945*l* 15s and interest; (2) alternatively damages. The defence and counterclaim were substantially to the following effect:—The defendants alleged that the plaintiffs wore not the owners of the pepper or tbe holders of bills of lading in respect thereof, and that they were not cntitled to maintain this action. Tbe defendants denied that there had been any breach of the contract contained in the bills of lading. They alleged that by the said bills of lading the pepper was to be delivered to the plaintiffs, only unless prevented by certain excepted perils, and that the delivery to the plaintiffs was, in fact, prevented hy the said excepted perils. With respect to the alternative claim, the defendants denied that they wrongfully deprived the plaintiffs of the pepper or of any portion thereof, and that even if it was the property of the plaintiffs, it was lawfully and necessarily sold in the interests of, and on behalf of, the plaiutiffs, and that the defendants had always been ready and willing to account for the proceeds of sale of the said pepper to the lawful owners thereof, ou being paid the money due to them (the defendants) in respect of the freight of the said peppor and other charges in connection witb the same. The defendants had paid into court in this action, in respect of the said pepper, on account of the sale thereof, an amount which they stated to be far in excess of any balance due to the plaintiffs. The defendants further pleaded in the altornative that the contract for carriage of the goods was entered into by the master of the defendants' ship as tbe agent of the charterer of that ship, and that she, being a German vessel and entitled to fly the German flag, was also entitled to all the privileges of a German ship; that the defendants and charterers of the said vessel were German subjects, rosident in Germany, and that the master was a subject of that country; that the charter-party was a German contract, and that the contracts contained in the bills of lading were made and entered into subject to German law; that, by that law, the salo of the goods, under tho circumstances, at the place where and at the time when they were sold, was lawful and right, and that the defendants incurred no liabilty by reason of tbe said salo; that the defendants are, by German law, entitled to roceive from the plaintiffs or owners of the said goods or holders of the bills of lading the freight agreed upon and specificd, and that tho defendants should be entitled to set off the said freight and other charges incurred by them or tbeir agents on and about the said goods against the proceeds of sale of the same in their hands, and that the plaintiffs are only entitlod to tbe oxcess, if any, of the realised, value of tho said goods (if such goods, or any part of them, helonged, in fact, to the plaintiffs) over and above the amount of such freight, together with the charges upon the said goods. Tbe defendants further alleged that they had always beeu ready aud willing to pay over any such excess in value, and that the amount in court was far greater than such excess; and, by way of a counterclaim, the defendauts asked that they should he paid for the carriage of the said goods or any part thereof belonging to the plaintiffs; also for charges incurrod and disbursements made by them on account of the plaintiffs in respect of the goods; and they claimed to rcceive from tho plaintiffs their due contribution to gcneral average charges on account of the said goods or such portion thereof as belonged to the plaintiffs. In the alternative, the defendants claimed freight and charges on the goods in accordance with the laws of tbo German Empire, by which, they said, the contract was governed. The defendants further said that, subsequently to the institution of these proceedings, they had ascertained that the amount paid hy them into court was 217*l* 4s 8d in excess of all possible claims by tho plaintiffs, and they asked repayment of that sum from the plaintiffs, who had received the whole of the sum of 1645*l* paid into court by tho defendants. Portions of the damaged cargo were disobarged, were survoyed by merchants called in for tho purpose, and, upon their recommendation, were sold at Cape Town, as damaged goods, at public auction, for the benefit of whom it might concern. With regard to the pepper, it was contended that, being of the kind known in the trade as Kongpoot pepper, it was almost impervious to damage hy sea-water, that the sale was quite unnecessary, and that after immersion in salt water, if it were allowed to dry, hy exposure to the air or sun, it would be practically as good as before its immersion. Some considerable portion of the pepper sold at these public sales in Cape Town was, in fact, reshipped to England hy the mail steamer "Garth Castle" and "Tartar," the first of such shipments taking place within eight days or so of the first, and on the very day of the second public sale of cargo ex "August." On arrival here it was sold by Messrs. Lewis & Peat of Mincing-lane, and fetched, at public sale, prices for the most part only about a farthing or three-eighths of a penny per pound helow full market prices ruling for sound pepper of a similar kind. Of tbe 240 bags told ex "Garth Castle," 159 bags were olassified by the dock samplers as "sound," while of the remainder of that sbipment fifty-one bags were catalogued as first class, twenty-three as second class, six as third class, and one as fourth class damaged. Of the 101 bags ex "Tartar," eighty-three were sold as "sound," sixteen as first class, and two as second class damaged. Tbese were sold hy the same brokers on November 13th and fetched 5¼d., and 5⅛d., and 5d. per lb. for the three descriptions respectively, the market baving fallen between tbe sale of the previous shipment and the above date. Buyers would be aware that the pepper bad heen reshipped from tho Cape of Good Hope, where uo pepper was grown. Tbey would, consequently, suppose that some reason had existcd to cause its transhipment, and would hid slightly lower prices in consequence.

Mr. Thomas Cuthhertson, of the firm of Edward Boustead & Co., London, and Boustead & Co., Singapore, was the first witness for the plaintiffs. Ho stated that he had carried on business at Singapore for a number of years. His firm made the contract for this pepper, cost, freight, and insuranco, to Messrs. Edward Pink & Sons, their co-plaintiffs in this action. It was not the same as what is known as Singapore pepper, which was prepared by smoke and heat, and would on that account more readily damage hy water. Tbis Kongpoot pepper was sun-cured, and could thus be more easily decorticated and ground into white pepper. Inside the outer husk was a skin which was almost impermeable. The skin, even if the sea-water were to penetrate the husk, would effectually prevent damage to tbe kernel which was inside it. Tbe sole use for this kind of Kongpoot pepper was for ground white pepper. The "August" brought back about 638 hags of the shipment.

Mr. Thomas Pink said he bappened to see samples of the pepper ex "Tartar" and "Garth Castle" not knowing at that time that they had been drawn from the lot sbipped in the "August." The samples were perfectly "sound" except those which represented the bags classified as "damaged." He would have bought some of the lots, but that be expected the "August's" shipment to reach his firm about tbat time or soon after. The pepper would do quite well for making into white popper, as the outer husk would be removed by the process called "pearling," and tbe kernel would be ground into white pepper, this being the particular use for Kongpoot pepper.

Mr. William Lee Darling, foreman sampler at the London and St. Katharine Docks, wbo sampled and classified 101 bags of the pepper ex "Tartar," and Mr. Stockwell, formerly foreman in a similar capaciy at the East India Dock, wbo sampled and classified the 240 bags ex "Garth Castle," were called to speak to the correctness of tbe classifications, as was also Mr. William James Barker, inspector of cargoes at the latter dock. Mr. Andrew Devitt, a member of the firm of Lewis & Peat, hrokers of Mincing-lane, was also called by tbe plaintiffs. This witness, in cross-examination by Dr. Raikes, admitted that, in his opinion, sea-water would affeot this class of pepper a little, making

it slightly grey in colour. This would, however, hardly apply to "first class damaged." If pepper were repacked it would be classified as third class. Mr. Cuthbertson having been recalled, stated, in answer to Dr. Raikes, that he might have ordered the sale of pepper at Singapore on account of sea damage when acting surveyor of cargo. He did, not however, remember having done so.

The plantiffs' case having closed, Mr. Otto Mühry, a member of a firm of merchants at Singapore, and now on a visit to this country, was called, and examined by Dr. Raikes, on behalf of the defendants. He had been engaged in the Eastern produce trade for about seventeen years. The "August" was chartered by his firm, and was put up as a general ship, and he remembered her loading. Boustead & Co. loaded the pepper, which was consigned to Edward Boustead & Co., London. The captain had instructions as to what firms he was to apply to in case the "August" should be obliged to put into any ports during the voyage. On August 15th, 1889, witness received a cablegram from Thomson, Watson & Co., Cape Town, the charterers' representatives at that port. The contents of the telegram were communicated, through witness's clerks, to the shippers, who were asked whether they had any instructions regarding the cargo. On August 27 the witness received a second cablegram, which stated that part of the cargo was seriously damaged, and that the surveyors had ordered the same to be sold without delay. This news was also communicated at once to the shippers. On November 4 witness got another cablegram, stating that the expenses of the "August" at the Cape amounted to 2,600*l.* and suggesting that the shippers should be asked to advance that sum, or a portion of it, to avoid a bottomry bond having to be resorted to. Witness sent round a circular to the shippers, who, however, declined to contribute anything towards the expenses. Witness thereupon cabled to Thomson, Watson, & Co., "Shippers decline." In witness's opinion such pepper as that shipped in the "August" is liable to damage by sea-water, but, perhaps, not so much as other goods. He had known cases of sea-damage to pepper, and remembered instances in which pepper had been recommended to be sold.

Sir Robert Phillimore having replied upon the arguments put forward on behalf of the defendants, the President said he would deliver his decision upon this point of the case at an early date; but, in any event, he would like to have translations of those decisions of the German Courts upon which reliance had been placed by the expert.—London *Grocer*.

PLANTING NOTES IN CEYLON FOR 1890.

The year that has just closed has been in most districts an exceptionally favourable one for flushing, and from all I have seen of 7 years old tea, with ordinary cultivation, I think a maximum yield has been secured. If 1891 is an equally mild and genial one, it strikes me, we are safe to see 56 million lb. shipped for the year. Coolies have generally been plentiful, and, with the exception of the wave of influenza, healthy. With so much really light work on tea estates there is not likely to be any great labour difficulty. With the judicious use of *real* Coast advances coolies will be forthcoming for all our needs. I have found more difficulty in regulating my labour force so that there shall be no short time than in actually securing the number required. With high cultivation in the shape of manuring this difficulty would be readily overcome, as tea over 6 years old in old coffee land with good soil and one-third manured yearly is safe to yield 400 lb. per acre per annum. The greater portion of the younger districts show growth equal to an average yield without manure of 500 lb. per acre off all 7 years old tea. Uva generally gives excellent promise, the higher fields showing as fine a growth and style of bush as I have seen anywhere, and much of the lower fields in Haputale that were so doubtful sometime ago will in my opinion be excellent tea yet. All that is necessary here is more care in planting and shading, than what is required at higher and more moist elevations, and patience to wait an extra year or two for results. Good mana and guinea grass land, planted in tea, continues to yield very satisfactorily.

The planting out of timber trees on waste land and along roads has been extensively carried out during the year. For easy and rapid growth, with almost no liability to die off, the grevillea takes the palm, while it appears to do little or no damage to the tea and adds a large quantity of fallen leaves annually to the soil. It would be interesting to know what these fallen leaves contain and give back again in fertilizing matter to the soil. Cedrela toona (red variety) and sapu are excellent for medium elevations, but the latter is fatal to tea if planted amongst it.

TEA AND TOBACCO IN MATALE.

We have got excellent tea crops in Matale—20 per cent over estimates in some cases, and I personally am pleased with the result of the year's working, and yet it has been one of the driest seasons for many years. Dry seasons are however becoming monotonous, and I will welcome a change. It has not been very successful so far, and this season in particular has been very unfavorable for it.

The Tobacco Company Directors hope to do well in tea, cacao and coconuts, and I wish them every success.

THE SCHOOL OF AGRICULTURE.

The school opened, in 1890 with the full complement of students, classes and castes being well represented. Mr. Jayawardene, who succeeded Mr. Lewis as headmaster continued to instruct the boys in practical work, as he had been doing since the foundation of the school; Messrs. de Silva and Rodrigo (acting for Mr. J. S. de Saram) being the other assistants. Under the supervision of the practical instructor a variety of crops were raised on the grounds attached to the school, such as paddy, cotton, dhall, Indian, corn, arrowroot, sugarcane, yams, beans, and other vegetables. The object of such cultivation is mainly to demonstrate to the students the best methods of growing these crops so that they may help to introduce or extend their cultivation in the rural districts, in place of less nutritious food products. The headmaster has also done much towards showing the boys the best methods of housing and feeding cattle kept for dairy purposes, while he has no doubt proved that the milk trade is not to be despised when properly set about, with a view to profit. The superintendent has endeavoured to make their agricultural studies as interesting as possible to the boys by the formation of classes in elementary geology, zoology, entomology, veterinary, and field surveying in so far as these services bear on agriculture, and it is satisfactory to note how much the students appreciate the instruction in these branches, and strive to excel in a knowledge of them. The boys taken generally were a very satisfactory lot last year, and among them were some of special ability, notably J. A. Kodippily among the seniors and E. Johannes among the juniors. The agricultural instructors in various parts of the island have reached the number of thirteen; of these seven are paid by Government and six privately. It is gratifying to find that the managers of the Prince of Wales's College have introduced agriculture into their curriculum, and that a large number of students attend the class. The Buddhist community have also started agricultural teaching in their school at Hatton. In both cases passed students of the school of agriculture have been chosen an instructors. Such private and voluntary efforts are most praiseworthy, and the benefits arising from them must be very great. It is satisfactory to find that a good few of the old boys of the school have started cultivation on their own account—some on a tolerably extensive scale. To make the work still further attractive excursions to Botanical Gardens, plantations, manufactories and other places of interest are periodically made. The school also has its own reading-room, museum discussion society and magazine. Looked at from an unprejudiced point of view, and with an intimate

knowledge of the results of agricultural teaching at the school, it cannot be doubted that the institution has fulfilled the object for which it was founded, and that its influence is slowly permeating the classes it was intended to reach. Granted that officialdom seconds the efforts of agricultural officers (and so far it is a matter of congratulation that much valuable help has been derived from that source) and that the rulers of the people persist in their endeavour to ameliorate the condition of the native agriculturist, and the work initiated by Mr. H. W. Green, late Director of Public Instruction, will be a source of much material benefit and happiness to the poor cultivators in Ceylon.

OUR FOREST DEPARTMENT.

The policy of the department has been to subordinate all other work as much as possible to the work of selecting and demarcating our future forest reserves. The Survey Department was busy during last year surveying blocks of forest selected by the forest officers. In the Western Province, in the neighbourhood of Mirigama some three or four thousand acres of forest have been surveyed for Railway Forest Reserves and the work is not yet furnished. Two large forests of about 3,000 acres and 2,000 acres have been surveyed in the Kalutara district. For the Colombo district two forests of about 1,500 and 1,000 acres respectively are being "settled" by Mr. Mantell. There are one or two other small forests ready for settlement.

The other provinces in which reserved forests have been selected and are either proclaimed or are in process of settlement are the Central, the Southern, the North-Western and Saharagamuwa.

The difficulty now is the appointment of a suitable Forest Settlement officer: different officers have been appointed from time to time but the work done by them has been as a rule very unsatisfactory. So far Mr. Mantell appears to have been the only one who understood the duties and took a real interest in them. It is the intention of Government, we believe, to appoint some civil servant as permanent Forest Settlement officer for the island. A R7,200 man will be appointed and he will get R10 per day commuted travelling allowance so that the appointment will be a good one. But one Forest Settlement Officer will not be enough. He could only "settle" 6 to 12 forests a year and at that rate a generation will pass before the Forest Department has its full extent of reserved forests. It would be very much better if Government were to appoint the different Chief Surveyors as Forest Settlement officers, each for his own province. They are far and away the best public officers outside the Forest Department for the work.

A good deal of timber and firewood was supplied to public departments during last year. In the Western Province however it has been found that the extent of forest land and the supplies of timber in private hands is so great that it is not worth the while of the Forest Department to compete with local traders. For the next few years the department will only supply public departments in the Western Province with timber that cannot be obtained from tenders or that may be urgently required. This however, applies only to locally felled timber. The Central Timber Depôt in Colombo will be kept up and will be stocked with satinwood, halmilla, milla, palu and other woods from other provinces. At present the Central Depôt is located on the Harbour Works Yard in Galle Buck, but the Forest Department is to take over from the Colonial Storekeeper in the course of the present year the land called "Beira" which juts into the lake between the Pettah and Fort railway stations. This will be a splendid site for a depot, and it is proposed to improve it by reclamation from the lake and by the construction of a railway siding, timber sheds, saw mills, &c.

During the past year timber depôts were opened at Kelaniya on the banks of the Kelanigango, and Kalutara on the banks of the Kalugonga and at Aluigama on the banks of the Bentota river. The work of stocking them will be commenced this year.

The work of checking the transit of timber on the Kelaniganga, the Kaluganga and the Bentota rivers was fully organized last year. Two superintendents and 10 river watchers were appointed. The illicit removal of timber is now almost stopped.

The felling of ebony has, we believe, been restricted throughout the island owing to the low price.

LONDON AND COLOMBO PRICES OF CEYLON TEA.

The average prices for our Ceylon tea in the London and local markets has been well maintained, as may be judged from the following:—

CEYLON TEA IN MINCING LANE.

Average rate realized		1885	..	..	1/2d
Do	do	1886	..	..	1/1d
Do	do	1887	..	..	1/1d*
Do	do	1888	..	..	11¼d
Do	do	1889	..	..	11d
Do	do	1890	..	..	11d

LONDON AND COLOMBO TEA PRICES.

The weekly averages for London and Colombo sales are in the first two columns as follows, (in the third column we add the ruling quotation for Standard Fair Pekoe Souchong):—

	Reuter's d.	(Colombo.) cents	G., W. & S. d.
Jan. 9th	11¾	44	10¼
" 16th	11½	44	10¼
" 23rd	11½	43	10
" 30th	11¼	43	9¾
Feb. 6th	11	42	9¾
" 13th	10¾	42	9¾
" 20th	10½	41	9½
" 27th	10½	41	9¼
Mar. 6th	10	41	8¾
" 13th	10	41	9
" 20th	10	42	9
" 27th	10¼	42	9
Apr. 3rd	†10½	42	9
" 10th	10¼	42	8¾
" 17th	10¼	40	8¾
" 24th	10¼	40	8¾
May 1st	10	39	8½
" 8th	10	39	8¼
" 15th	10½	42	8¼
" 22nd	10½	42	8¼
" 29th	10½	44	(Holidays)
June 5th	10¼	44	8½
" 12th	10½	46	8¾
" 19th	11	46	9
" 26th	10¾	46	9
July 3rd	10¾	46	9
" 10th	10¼	43	8¾
" 17th	10	43	8¾
" 24th	10½	36	8¾
" 31st	10¼	36	8½
Aug. 7th	10¼	39	8½
" 14th	10¼	39	8½
" 21st	10¼	40	8½
" 28th	10½	40	8½
Sept. 4th	10¾	41	8¾
" 11th	11	41	9¼
" 18th	11¾	42	9¾
" 25th	1/	42	10
Oct. 2nd	1/	46	10
" 9th	/11¾	46	10
" 16th	11¼	42	9¾
" 23rd	11½	42	9½
" 30th	11¾	42	9½
Nov. 6th	11¾	42	9½
" 13th	11¾	41	9½
" 20th	11¼	41	9¼
" 27th	11¼	42	9
Dec. 4th	11¼	42	9
" 11th	11	40	8¾
" 18th	10¾	40	8¾
" 25th	(Holidays)		(Holidays)

A TUSK OF IVORY.

MR. HERBERT WARD, IN "SCRIBNER'S MAGAZINE."

Silent, and almost motionless, quite hidden in the darkness, stood the huge form of an old bull elephant, one of whose tusks had been damaged in his youth and had become totally decayed. His head was bent forward in order to rest his one monster tusk upon the ground, his trunk, loosely coiled between his fore-legs, was also resting on the ground, and his great ragged ears flapped spasmodically in vain endeavours to shake off the myriads of mosquitoes that persistently hovered around his head. Suddenly the forest was lit up by a most vivid flash of lightning, followed an instant afterwards by a crashing peal of thunder. The elephant raised his head with a startled jerk, his huge limbs shaking with fear. Almost before the rumbling, echoes of the thunder had died away, the rain, that had been threatening for so many hours, fell in torrents. Flashes of lightning succeeded each other so rapidly that the attendant peals of thunder were converted into one continuous roar, and the violence of the wind soon increased to a veritable tornado—a tropical hurricane. Trees were blown down and uprooted on all sides of the terrified elephant, who remained for some time motionless with fear, but, as the tempest continued, the monster became suddenly panic-stricken, and charged madly through the dense forest, stumbling and falling over the trunks of uprooted trees in his endeavours to gain some open patch where there would be no danger of being crushed by the falling timber. The lurid flashes of lightning revealed the frightened animal with coiled trunk and head bent low, blindly smashing a way through the dense woods. Suddenly, in the midst of a mad rush, the elephant sank to the ground with a sharp squeal of pain. The poor brute had severed the vines that supported one of the traps that had been arranged the previous day, and a heavily weighted spear was plunged between his shoulders. For some moments the wounded animal remained motionless, then the great body rolled slowly from side to side in vain endeavour to free himself from the spear, but the weapon was barbed and the points had penetrated too deeply to be shaken off. After many efforts the animal at last got on his legs again and staggered a short distance through the forest until, growing rapidly weaker from loss of blood, he stopped to rest and leaned the weight of his body against a large ant-hill, breathing heavily and groaning deeply in agony. Here he remained, exhausted, until daybreak, his hide covered with patches of mud and deep red smears of blood. Gradually the rain ceased, and the wind died away. With the first glimpse of dawn in the village, there was creaking from the small square cane doors of the huts, as they were removed one by one, and dark, manly figures, with long spears in their hands, stepped forth and stretched themselves, after their night's heavy sleep.

After hastily arranging their scanty loin-cloths of beaten bark, the men all started into the dark woods to see if any elephant had been wounded by the traps. The party entered the forest in single file, but soon divided into small companies and set off in different directions. Ioko took an entirely different route from the others, and when about two miles from the village he halted suddenly, snapped his fingers, and placed his hand over his open mouth saying to himself in a low tone: "Look at this elephant track! See what a path is here!" He followed the trail for some time, until within view of the trap he had set the previous day, when his excitement became intense, for he found the spear was gone, and the grass and leaves beneath the snare were covered with blood. Without hesitation, he followed the blood-stained tracks, until he approached the great ant-hill, near which he stopped a moment to extract a thorn from his foot. He was startled by a deep groan, and, cautiously stepping forward, he saw his prey leaning its unwieldy form against the mound. "Lo-o-o! It is the evil one, Litoi Linene!" (Big Ears) gasped Ioko to himself excitedly. Silently watching the animal, to decide in his own mind upon the best mode of spearing him in a vital part, he firmly gripped his heavy spear, the shaft of which was fully eight feet long, and stepped softly forward until within reach of the left shoulder of the unconscious animal. With steady nerve he poised his weapon, and with a mighty plunge drove the keenbladed spear deep into the elephant's heart, and sprang away among the trees. With a shrill, trumpeting cry of pain, Litoi Linene staggered to his feet, swayed forward quivered, and fell to the ground lifeless. Ioko after waiting a few moments to satisfy himself that the animal was dead, calmly stepped fourth and raised a cry that echoed through the woods, aud which soon brought several of his companions to the spot. Without any further sign of excitement he quietly busied himself in cutting his barbed spear from the carcass. He then examined the one large tusk and the decayed stump of its fellow, remarking to his companions, who were now arriving: "Now the evil spirit is dead. Litoi Linene will lead no more devilish elephants to our plantations."

In a very short time the scene became indescribable. Excited men with sharp knives commenced cutting lumps of meat from the still warm carcass, and throwing them to the eager women and children, who crowded around the baskets, quarelling like wild animals over the possession of each piece of flesh that was thrown among them. The savages' hearts were filled with joy at the prospect of a huge feast. That night, under cover of the darkness, Ioko, all alone, buried the one heavy tusk of Litoi Linene in a swamp far from the village, so that only he himself knew of the place of concealment. He hid the tusk according to the tribal custom, for in the Aruwimi districts the people of neighbouring villages are seldom good friends, and they all have a habit of attacking each other at odd times in order to capture men, women, and children for cannibal purposes. As tusks of ivory have an acknowledged value, equal to that of a human being, it is customary for the members of each village to conceal in the forests as many tusks as they can obtain, so that they may be in a position to redeem, if permitted, any of their companions who may be unfortunate enough to fall into the hands of their hostile neighbours.—*Public Opinion.*

RETURNS FROM THE INDIAN MINES.

As the present year of grace approaches its close investors are naturally on the *qui vive* for information upon which to base their divided calculations—where there is any possibility of such a happy termination of the twelvemonth's operations. It will not be out of place, therefore, if we give some particulars with reference to the production of gold from the three leading Indian mines. We do so with the greatest pleasure as the properties are yielding well up to the expectations we have often expressed, even when the gold mining industry of Southern India was at such a low ebb that Mysore shareholders flung away their holdings at 3s. or 4s. each; and intelligent and enterprising men like the late Sir William Abbott; to say nothing of the Messrs. Taylor, Sir Charles Tennant, and other believers in the value of the Mysore Goldfield, were regarded by many people as misguided and sanguine visionaries,

Last year, as was shown in an article which appeared in the *Financial News* on October 18 last, the Mysore Company paid dividends of 75 per cent. from actual mining operations, and 50 per cent. from the sale of a portion of the property to the Champion Reef Company, and there is every reason to expect that this year, without any assistance from a subsidiary venture, the Mysore dividends will reach the very satisfactory figure of 100 per cent. The Nundydroog Company has already paid nearly 14 per cent. on account of the present year, and will probably pay double that payment when the full accounts of the year come to be dealt with; and the third property of the trio, Ooregum, although unable to declare a dividend until the House of Lords decides whether or not the issue of the Preference shares was *ultra vires*, has unquestionably placed the Company in possession of a handsome balance of profit for division when it can be legally done. The trio are thus doing so well that we think those who hold shares in the undertakings would act very unwisely in parting with their holdings at anything like the prices now ruling. For these mines at all events, the days of doubt and uncertainty have passed, and their success cannot but be an incentive to greater exertions on the part of the managers of the other Indian properties, and to renewed confidence on the part of those whose hopes have been so long deferred. However, our present purpose is to analyse the returns of the three really successful properties.

It is worthy of note, in the first place, that last month's yield of gold from the Mysore Mine—5,250 oz.—was the best on record, showing that as the property is opened out in depth and in width its productiveness steadily increases. We should be exceedingly sorry to under-estimate by one iota the services which Captain Plummer rendered to the Mysore Company, and, indeed, to the district generally; but at the same time it would be equally unjust to dispute the fact that his successor occupying a difficult position in following such an expert, has well deserved the golden opinions which his management has won. Some months ago the influenza and its after effects caused a falling-off in the returns, and it was concluded by some pessimists that with Captain Plummer the glory of Mysore had departed. That this conclusion was an inaccurate one is now manifest. In the following table the crushings month by month since the end of 1888 are given, from which the shareholders will see at a glance what progress has been made:—

	1890.			1889.	
	Tons.	Oz.		Tons.	Oz.
January ...	3,271	5,003	...	2,066	2,376
February ...	3,000	5,884	...	2,023	3,038
March ...	3,200	5,884	...	2,459	3,249
April ...	3,661	4,571	...	2,600	3,249
May ...	3,385	4.263	...	2,672	3,872
June ...	3,491	4,461	...	2,866	4,275
July ...	3,207	4,174	...	2,947	4,527
August ...	3,138	4,118	...	2,900	4,739
September...	3,100	4,258	...	2,942	4,879
October ...	3,009	5,014	...	3,030	4,424
November...	3,100	5,250	...	3,040	5,157
December ...	—	—	...	3,021	4,829
	35,564	52,865		32,566	49,234

The average yield during the past eleven months has been just under 1½ oz. of gold to the ton of quartz, comparing with a trifle over that percentage for the whole of last year. Last month's average was, however, very nearly 1 oz. 14 dwt. per ton, showing a distinct improvement on the aggregate percentages which we have just mentioned. For the eleven months of the current year it will be seen that the gold produced has exceeded by 3,631 oz. the total production of last year, when, as we have said, 75 per cent. was paid to the shareholders out of the working profits.

Turning, in the next place, to the Ooregum Mine, the table given below shows that the monthly crushings have augmented in a very satisfactory manner, the eleven months' production exhibiting an increase of nearly 50 per cent. over the whole of last year:—

	1890.			1889.	
	Tons.	Oz.		Tons.	Oz.
January ...	825	1,784	...	454	839
February ...	957	2,032	...	482	927
March ...	1,0[illegible]5	2 075	...	508	1,032
April ...	966	2,049	...	5[illegible]5	1,225
May	1,004	2,107	...	626	1,353
June... ...	1,010	2,127	...	691	1,427
July	1,022	2,161	...	714	1,467
August ...	1,110	2,306	...	745	1,506
September ...	1,173	2,491	...	729	1,563
October ...	1,247	2,646	...	756	1,620
November ...	1,297	2,725	...	772	1,662
December ...	—	—	...	777	1,683
	11016	24,503		7,639	16,434

The percentage of the gold produced has been practically the same this year as last—2 oz. 2 dwt. to the ton of quartz, and that was lmost precisely the result of last month's crushing. The average is an exceedingly good one, especially in view of the steady increase in the amount of mineral crushed, and the Nundydroog returns are, relatively, even more satisfactory, as will be observed from the subjoined table:—

	1890.			1889.	
	Tons.	Oz.		Tons.	Oz.
January	670	1,139	...	370	581
February... ...	700	1,321	...	280	394
March	650	117	...	300	514
April	650	986	...	300	485
May	700	1,085	...	300	520
June	750	1,400	...	300	498
July	800	1,488	...	300	497
August	900	1,418	...	310	491
September ...	875	1,421	...	339	324
October	900	1,478	...	320	363
November ...	925	1,475	...	312	700
December ...	—	—	...	350	751
	8,520	14,228	...	3,781	6,118

Here we see that the yield of the precious metal for the past eleven months has exceeded by 8,110 oz., or about 130 per cent., the total production for the whole of last year; and whereas the percentage last year was a little over 1 oz. 12 dwt. of gold per ton of quartz, the percentage this year has been about 1 oz. 13½ dwt.—also a very satisfactory average. Results such as these cannot fail to be gratifying to those who are interested in the Companies. They show that the Champion Reef of the Colar district is highly auriferous, and that with systematic and competent management, such as these mines undoubtedly have, permanently valuable returns are tolerably certain, and they suggest also that, whatever may be the fate of the lag-behinds among the Indian properties, the Mysore trio promise to give a very good account of themselves for some time to come.—*Financial News*, Dec. 15th.

COFFEE PLANTING.

TO THE EDITOR OF THE "MADRAS TIMES."

Sir,—If you will allow me the space, I should be glad, as a novice in Coffee Planting, to obtain opinions from some of your readers. Men of experience, will I hope, not consider me on certain details unduly sceptical, I would, in the first place, ask why forest land, independent of good lays, is invariably preferred to grass lands in the hollows of valleys. The best permanent soil is to be found in such positions in India

as elsewhere, probably. Forest land in this country requires manure for coffee, yet apparently for a quicker start men prefer steep slopes. The land after clearing must from its position and in a climate of great heat and heavy rains, quickly deteriorate. On the other hand, levels can be forked without loss of soil, the process alone without manure being a continuous improvement.

Drainage of course is necessary, as with nearly all other cultivation.

Moreover the hill sides seem most difficult to protect from winds, necessitating what would appear a severe and wasteful topping. From the consequent excessive growth of wood and succours in so small a limit, pruning has to be rigorously attended to. An art that even few English gardeners understand.

The next question is as to the best distance to plant. Irrespective of the size of a healthy bush, it may be asked why 6 into 6 is advocated with a plant having such immense and exhaustive lateral roots. The only answer I could ever obtain was, that by covering the ground, weeding is saved. This seems a doubtful argument with labour at 5 annas the day; crop at £100 the ton. Again with the casual labour of India compared with the skilled of Europe is it reasonable to expect satisfactory profits from such large plantations, as appears to be the correct idea? To properly cultivate 100 acres of fruit trees, 1,200, even 1,500 in some cases, to the acre, is no casual work. Some able men succeed, but it is safer to ask the cause of ninety-nine failures, than to be told, as is too often the case, of one success.

If men of experience could have begun with what they know now, would they or not have sought out the sheltered hollows of valleys, planting their coffee in small fields with ample space between each bush, say at 9 into 9 and topping at 6 feet, where grass lands would admit manure on the spot and irrigation available? What secures good crops in coffee, the writer knows not; but it is certain that in Europe fruit trees best succeed by regular surface digging and top manuring, thereby enticing the lateral roots towards the surface. It is stated that there is no gain from topping high, as the lower branches die; but is this really so if the bush is well nourished and has sufficient room for light and air?

Shade is now advocated. Is it an advantage where irrigation is available, or is it only a help in the event of showers failing to give sufficient moisture to lateral roots when the blossom is out? L. C.

Tea in Ambagamuwa giving 450 lb. all round per acre at five years old, and planted on patana and scrub land, must be considered very good, and shut the mouths of critics who speak of the district never bearing more than 300 lb. all over. One of the largest places in lower Ambagamuwa has, we hear, exceeded the estimate by over 10,000 lb. of tea giving 400 lb. an acre for young and old fields all over.

Darjeeling.—Simply delightful weather here for those who are left in the "Holy Spot," and barring a few cases of mild chilblains, I know of nobody who is either sick or sorry after the Christmas festivities. The tea drier controversy in your columns, I confess, is a little over my head, but I certainly think Mr. Davidson has the best of it. I know as a fact, that one of his driers in this district was tinkered at by an amateur *ka wallah*, of cou s with a view to improving it, and equally of course, with the result of very much lessening its drying capabilities. *Verb. sap. sat.* I have heard great things of the Blackman air propeller, as used in this district on one garden, which almost always tops the list in the London market, and hope to be able to tell your readers all about it when the next manufacturing season comes round. So far as I can hear and see, cold weather work in this neighbourhood is well in hand, and I have heard nothing in the way of complaints as to labour being in any way short.—*Indian Planters' Gazette.*

ECHOES OF SCIENCE.

MM. Fremy and Verneuil have presented another paper to the Académie des Sciences, Paris, on an improved method of manufacturing rubies. Instead of employing pure aluminia, they now use chromated alumina, alkalised with carbonate of potash, which does not impair the purity of the crystals, while faciliating their formation and embracing the beauty of their colour. Other improvements have been introduced, especially in lengthening the time of the reaction to a week or more, thus engendering hard, rhombohedral crystals of a large size. A gas furnace is used in place of a coke one, and thus a constant temperature of 1,300 deg. C. can be maintained for weeks. Large crucibles, giving more than three kilogrammes of rubies at one operation, are now adopted. MM. Appert, the well-known glass-bowlers, have allowed the investigators to make use of their furnaces, and they have thus been able to prepare rubies which are in part sapphires or crystals, red on one side and blue on the other a phenomenon sometimes found in nature. The same charge will also produce crystals entirely red, and others wholly blue, perhaps owing to a difference in the oxidation of the chromium.

Can these crystals, which are large as natural stones be used for jewellery and in clockwork? Practice alone can answer this question, but M. Taub has submitted them to a lapidary, who found their hardness comparable to that of the ordinary ruby. The experiments may now be considered to have reached the industrial stage.

On the right bank of the River Lunain (Seine-et-Marne) there are beds of sand which, according to a recent discovery, served to polish the flint weapons of the Neolithic men in that part of France. M. Armand Vire has found no less than ten *ateliers* of the new stone age in this district. Most of these primæval work shops are situated on the hills along the rivers, and not in the valley itself. Probably it was safer in those days to work under cover of the forest than beside the stream, although the polishing sand had to be transported with some labour.

Gutta percha derives its name from the Malayan words, *gueta* a gum, and *pertcha* a cloth, and was introduced to the civilised world in 1842, by Dr. Montgomery, a Scotch surgeon. The first specimens were brought to London from Singapore by José Almeida, and the properties of the gum were announced by Hancock, Wheatstone, and Faraday. The last two physicists recognised its fitness as an insulator of wires conveying electricity, and it was so employed in the first submarine cable, laid by Mr. C. V. Walker, in the Channel, and subsequently in that laid between Dover and Calais in 1851, and in the Transatlantic cables.

The only guttapercha suitable for insulating cables is obtained from the species *Isonandra*, inhabiting the Malay Archipelago, and during the last forty years the trees have nearly been exterminated by the natives recklessly cutting down the second growth. The original variety, the *Isonandra Gutta* of Hooker is now only found on the Chasseriau Estate in the old forest of Boukett Tunah (Hill of Tin), situated in the middle of Singapore. Other representatives of the species are also becoming scarce, and the gums of the African *Bassia Parkii*, the Guianan *Mimusops Balata*, and the *Payena Leerii* are very inferior substitutes. Fortunately the Dutch have taken up the culture of the plant in Java with success; but it would be well if serious attention were turned to its propagation in Singapore, its native habitat. Gutta percha farming is likely to be profitable,

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A tree recently discovered in, tee Sequoia National Park was 41⅓ feet in diameter. 250 feet high, and had 6,126 annual rings of growth.

The motto the Brazilians had stamped upon. their new 20 rs. broze coin is "Vintem popuado, vintem ganho,"—a cent saved is a cent earned.—*American Grocer.*

THE PREVENTION OF LEAF DISEASE IN COFFEE.

TO THE EDITOR OF THE "MADRAS TIMES."

Sir,—Some of your planting readers might be disposed to try whether the immersion of coffee seed in hot water previous to sowing would have the effect of preventing partly, or altogether, leaf disease. The idea was suggested to me by reading part of an article, of which the enclosed * is an extract in the London *Standard*, and I also enclose an extract † from Stephen's Book of the Farm, shewing how seed was pickled to prevent smut in barley, wheat and oats.

Some weeks ago, I steeped 2 lots of coffee seed in hot water of 120 and 130 degrees Fahrenheit, respectively, for 5 minutes, after soaking it in cold water for 15 hours previously. It was quite soft and was sown immediately. It has come up strong and vigorous, and I am making nurseries with the seedlings. Next year, if I am spared, I shall steep some in still hotter water, say 135 degrees, as the cold moisture in the seed after soaking in cold water cools the water considerably.

S. E. Wynaad, 19th July 1890. T. M.

ENCLOSURES.

* Extract from *Standard* of November 6th, 1888.

HOME AND FOREIGN AGRICULTURE.

Farmers who have not finished sowing their wheat may with advantage study the results of some important experiments in the prevention of bunt and smut carried out by Mr. Jansen, of Copenhagen, and recorded in the new number of the Royal Agricultural Society's Journal Mr. Jansen has found by repeated trials that both the fungoid diseases referred to can be prevented by immersing the seeds of wheat, barley or oats in water of the temperature of 127 to 135 degrees, Fahrenheit. In the case of wheat and oats immersion for 5 minutes, without previous soaking suffices, but the husk of barley adheres so tightly that it is necessary to soak the grain in cold water for about 12 hours, and afterwards to place it in hot water for 5 minutes.

It is important to observe that a temperature of 135 degrees is the extreme allowable with safety. This prevention is recommended for wheat instead of the ordinary plan of dressing the seed with sulphate of copper or other chemical preparation, because we are told the latter treatment is injurious to the grain and the crop grown from it.

Sulphate of copper in the quantities generally used, Mr. Jansen says, destroys not only the fungus but from 3 to 10 per cent of the seed corn; whereas water, at the temperature mentioned above is harmless to the grain, though destructive to the fungus, nor is this all, for the experimenter finds that the vitality of the plants not killed is impaired by sulphate of copper so that their average weight in autumn is diminished. This year he found that the yield of wheat in plots sown with heat disinfected seed was 30 per cent. more in grain and 23 per cent. more in straw than that of plots sown with grain dressed with the chemical preparation.

† Extract from Stephens' Book of the Farm, Vol. 1. Para 2307.

Seed wheat should be pickled, that is subjected to preparation in a certain kind of liquor, before it is sown, in order to insure it against the attack of a fungal disease in the ensuing summer called smut, which renders the crop comparatively worthless. Some farmers affect to despise this precaution, as originating in an unfounded reliance on an imaginary specific: but the existence of smut, and its baneful effect upon the wheat crop, are no imaginary evils; and when experience has proved, in numberless instances, that steeped grain prevents the appearance of this serious disease, the small trouble which pickling imposes may surely be undertaken rather than place the entire crop in jeopardy. Why pickling the seed should have the effect of preventing the smut in the crop is a question more easily asked than answered: and it is perhaps because it has never received a satisfactory answer that pickling is disregarded by some farmers. No valid objection can be stated against the practice, for the palpable fact stands obvious to conviction, that one field sown with pickled wheat, and otherwise managed in the usual way, will escape the smut, while the adjoining one managed in exactly a similar manner, but sown with wheat in its ordinary state, will be almost destroyed with the disease.

I have seen such a case tested by two neighbouring farmers, the Messrs. Fenton, late tenants of Nevay and Eassie, in Forfarshire. It is true that on some farms, wheat sown in its usual state, escapes the disease, which I have heard the late Mr. Oliver, Lochend, near Edinburgh, state was the case on his farm; and it is also true that pickling does not entirely prevent the occurrence of the disease on other farms; but such cases do not prove that every farm must also be free of smut, indeed no one, beforehand, can aver that any farm shall be so, and while so much uncertainty exists, the safer practice will be to pickle the seed, the expense being a mere trifle.

It is now an ascertained fact that vaccination will not insure immunity from small pox, yet it certainly very much modifies its attack, when it does occur, and precisely so is the case with pickling wheat.

[There is no harm in trying experiments, but the misery of it is that plants, the most healthy and robust as they spring from the ground, get at once infected, if leaf disease is in the locality or country.—ED. *T. A.*]

THE Foochow native paper states that the tea trade in Formosa this year, has been very brisk, and that the Douglas Company had three steamers carrying the tea.—*China Mail.*

SULPHUROUS ACID is now being used to act upon starch under pressure and at a high temperature. The product, after neutralisation, is Schumann's universal gum, which is soluble and extremely adhesive, and closely resembles gum arabic, which is now very scarce and dear.—*India-Rubber and Gutta-Percha Journal*, Dec. 8th.

NEW ZEALAND FLAX.—Says the *New Zealand Herald*:—"The import of New Zaland flax into the United States under the McKinley tariff should give this industry a fillip, and lead to its more extensive introduction for manufacturing purposes into the Great Republic. Captain Webb (of Arnold, Cheney and Co.) states that the duty formerly charged was 25 dollars, or £5 per ton which was a pretty heavy impost.

A NEW INDUSTRY has sprung up in Germany with young leaves of the strawberry. These are taken, carefully dried and used instead of Chinese tea. They are said to give a decoction nearly approaching that of tea in flavor, and having the same refreshing influence. In many parts of England the leaves of the raspberry, hedge bramble and of the sage are commonly taken as a substitute for tea. The Chinese use the common sage very largely in flavoring tea for their own use.—*Mildura Cultivator.*

A BOTANICAL DISCOVERY.—A very important discovery is reported from Goa, writes a correspondent. For what can be gathered from a pamphlet issued by Mr. B. F. da Costa, a gentleman well-known in Portuguese scientific circles, he claims to have discovered in the milk of *Nivol-Cantem* (*Euphorbia nerlifolia*) an admirable substitute for gutta-percha. The plant is abundant, and grows wild in the Concan districts, generally used for hedges. Mr. da Costa in describing its qualities, says that it is insoluble in water, it softens under heat, and hardens in the cold. It receives and retains a given moulded shape, can be cast into very thin sheets, and is capable of receiving the minutest impressions on its surface. It is liable to become sticky, if exposed to the sun. In its dried state, it is of a chocolate colour. In fact, it has all the properties of gutta-percha. —*Pioneer*, January 2nd.

COMPARATIVE CONSUMPTION OF TEA FROM DIFFERENT SOURCES IN BRITAIN.

The figures afforded by Messrs. Gow, Wilson & Stanton are strikingly illustrative of the extraordinary revolution which the tea trado in Britain has undergone between 1878 and 1890. In the former year Indian tea had commenced to be a formidable competitor with China, the proportions consumed by British tea drinkers having been 23 per cent of Indian to 77 of China. Ceylon did not shew even 1 per cent until 1884, when the proportions had become:—China 63 per cent; Indian 36 and Ceylon 1. In 1887, Indian with 45 per cent and Ceylon with 6 per cent, became, for the first time, unitedly in advance of China: 51 per cent against 49. In 1889 Indian by itself took first place with 52 per cent, and retained this position in 1890. Meantime Ceylon had risen, by leaps and bounds to 18 per cent, while China had receded to 30 per cent, in the market in which she was once supreme. In the next few years the competition will be mainly between the mature giant of India and the young giant of Ceylon, the aged genius who presides over the product of the flowery land sinking gradually, we feel pretty certain, into decrepitude and decay. While India is now, after passing the limit of 100,000,000 lb., making but slight annual advances, Ceylon is increasing her output at a rate which in less than a decade is likely to see her exports, which were inappreciable in 1883, up to the round 100,000,000 of pounds, with India probably at 140,000,000 and China a vanishing quantity of perhaps 10,000,000. The figures for deliveries, (for export and consumption), in the season ended May 1890, were:—

Indian tea	101,000,000 lb.
Ceylon ,, ...	32,000,000 ,,
Java ,, ...	3,280,000 ,,
China ,, ...	87,652,000 ,,

More than one-third of the latter was for export.—The import of Indian tea in October 1890 was so high as 15,237,000 lb., with deliveries equal to 9,822,000. Of Ceylon the highest import was 5,142,000 in July, the highest figure for deliveries being 3,960,000 in September. But in May 1889 the deliveries had exceeded 5 millions by 19,890 lb. The rapid rate, indeed, at which Ceylon is gaining on India and distancing China, is the special feature of the really revolutionary returns which reveal the recent history of the tea trade. In looking at the figures for import of Ceylon tea into Britain, we must not forget that our exports direct to Australia now exceed 2½ millions of pounds, while to other colonies and foreign countries we send more than a further half million. The actual distribution of our 1890 crop was :—

To Britain ..	42,828,743 lb.
,, Australia ..	2,552,861 ,,
,, other countries..	561,865 ,,

NOTES ON PRODUCE AND FINANCE.

(From the *H. and C. Mail*, Dec. 26th.)

REGULATION OF THE SUPPLIES.—We understand that at a meeting of Indian Tea Brokers, held this week, it was resolved that endeavours should be made to regulate the quantity of Indian tea offered at auction in January to 35,000 packages per week, and in February to 30,000 packages, after which a further meeting is to be held to consider the matter.

INDIAN TEA IN FRANCE.—We learn that the Indian Tea Districts' Association have submitted to the Trade and Treaties Committee of the Board of Trade a special report upon the desirability of obtaining a reduction in the rate of duty levied upon tea entering France. A simultaneous effort will be made through the London Chamber of Commerce to get the industry better terms in connection with the revision of the French Customs Tariff.

INDIAN AND CEYLON TEA IN AMERICA.—They are selling inferior China tea, some of it re-shipped from London in the United States as "English Breakfast Tea," and obtaining a high price for it. Americans who have been in England lately know something about the merits of Indian and Ceylon Tea; and on their return these visitors to Europe express their opinion rather freely upon the China and Japan tea offered them at many American hotels. This should help the sale of Indian and Ceylon teas in America.

PRICES OF PRODUCE.—The prices of produce, compared with those in the previous year, do not show general depression, and with the steady increase of consumption the outlook seems more favourable than was lately the case. In the tea, coffee, and sugar there are no special causes of complaint, and importers and brokers are inclined to take a hopeful view of the outlook.

CLEARING TEA.—The Commissioners of Customs have appointed a committee with instructions to report upon the mode in which the accounts are kept in connection with the various bonded warehouses particularly those in which tea is stored.

DAVIDSON'S SIROCCO.

Mr. Davidson has drawn our attention to a long letter in which he meets criticisms on his down-draught sirocco. We cannot find room for the letter entire, but we make extracts as follows:—

When your paper reached me in Belfast on the former occasion, I at once telegraphed to my agents, to, if possible, ascertain *where* the machine was to which "Darjeeling-ite" referred, and for them promptly to send my engineer, Mr. Maguire, to the place to put matters to right.

After some delay this was ascertained, and Mr. Maguire visited the garden. On examining the machine he found fitted upon the outlet of the fan, a pipe for conveying the exhaust air to the leaf withering loft, and not only was this pipe in itself much too small to let the necessary amount of air escape (unless the fan were driven at about double or treble the speed I arranged it for) but the air passage through it was further blocked by the pipe having several angles in it, and its end was entirely closed, but holes were made along it to let the air out in small jets, in accordance with Darjeelingite's special ideas for withering his leaf.

Of course Mr. Maguire insisted on this pipe being removed, as I did not arrange for the machine being worked as a compound leaf witherer and tea drier, and he very properly declined to make any test until it was taken off, eventually it was removed, and the trial of the machine's capabilities as a drier proceeded with. The details of the trial were most minutely entered up and tabulated in one of my usual report forms and signed by the Manager of the garden. This report shows 164 lb. of tea dried in the hour with 124 lb. wood fuel, and as it bears the Manager's signature, it would be casting a serious imputation upon him, were I in any way to doubt its being a "really fair trial" (as your other correspondent, "A Manager, &c." asks me to do) or to impute inaccuracy to what he signed.

My estimate was that the machine could dry about 100 lb of tea per hour with about 130 lb of ordinarily good wood fuel.

Now, sir, have I, or have I not, proved my case "up to the hilt" as against Darjeelingites original accusations that the machine could only dry half that amount of tea per hour, and would burn five times the amount of wood?

"Darjeeling" I see states, that although "The mechanical arrangements are otherwise good, one fault of the Sirocco is that dry air does not enter the machine but the damp air of the floor," but surely he scarcely expects the machine to manufacture its own air supply as well as work his pipe contrivance in addition to drying the tea!! He, however, says his pipe contrivance "cannot affect the action of the fan," and certainly if

the fan can cope with such a blockade as he applied on it without being affected thereby, why he may perhaps find it making its own supply of air some day as well!!

Meantime, however, I would advise him to provide the stove with *a direct* supply of air *from outside the house*, even although it be at the point of complete saturation (which is seldom if ever the case with the outside atmosphere) as air fully saturated at 65° F. if raised to 120° F. becomes practically dry air—which latter temperature is as low as air ever reaches in the exhaust of the fan. Hence saturated air at 65°, forms *practically* a dry air supply for an apparatus which discharges its exhaust air at 120° F. What causes many managers to think that it is owing to the dampness of the outside atmosphere on wet days that their driers give lower results than on dry days, is that on wet days the windows and doors of the tea-house are usually closed up, and they go on using the same air that is within the house over and over again with but little fresh air being admitted, and it is not long till this becomes absolutely saturated even at the high temperature it attains to, seeing that a Down-draft Sirocco passes about 300,000 cubic feet of air through it per hour and turns about 200 to 250lb. weight of water into vapour in the same time—so that ere long the machine is actually drawing in hot vapour with very little air in it and drying with superheated vapour instead of hot air to the very serious detriment of the quality of the tea produced. On fine dry days the windows and doors of the tea-house are all wide open, and the vapour gets out, and fresh air gets freely in and the drying goes on so much better in consequence.

My advice to all users of Siroccos is, to either blow the exhaust air out of the factory entirely or else provide a large duct to lead fresh air to the stoves from the outside atmosphere.

From the testimonials adhibited we quote as follows :—

From.—J. N. Campbell Esq., Superintendent of Morary Tea Estate Musketry [!—ED. *T. A.*] Ceylon, 22nd August 1890.

"Outturn per hour of dried tea 214 lb. wood fuel per hour 98 lb. This is equal to about 2½ lb. of tea dried per lb. of fuel."

From.—H. D. Dean, Esq. Superintendent Kintyre Tea Estate, Maskeliya, Ceylon, 6th August 1890.

"I am perfectly convinced that the capabilities of the Down-draft are in no way over-estimated in the advertisements, and have no hesitation in saying that from 180 to 200lb. tea an hour can be easily obtained from the machine."

MIXED SPICES.

A correspondent asks the nature of mixed spices, a question the reply to which will be of interest to many. Mixed spices are a compound of many different sorts, in order to save the housekeeper time, trouble and expense. She need no longer buy a small quantity of many sorts and experiment in combining them in the right proportion, for this is done for her by the spice dealer. In a popular formula the following eighteen kinds of spice are used: White pepper, shot pepper, allspice, ginger, mustard, coriander seed, celery seed, cloves, long pepper, cardamom seed, cassia buds, cumin seed, mace, caraway seed, Ceylon cinnamon, bay leaves, Chili pepper, Malabar pepper. The proportions are kept secret by the leading mixers, being regarded private property.—*American Grocer.*

CHINA: PROPOSED IMPROVEMENTS IN TEA GROWING.

Mr. E. Pinches, who lately gave the Shanghai Chamber of Commerce some information as to his proposals with reference to the cultivation of the tea plant in China, writes to the *N.-C. Daily News* as under from Tientsin, where he has been stopping on his way to Peking. Mr. Pinches says:—

'Briefly my proposals are simply to endeavour to obtain from the Government at Peking a tract of land either at Shanghai, Hankow, Foochow or Formosa, to be handed over to a Chinese Company for a period of not less than 15 years, in which would be established a tea-garden to be worked in the same manner as tea gardens are worked in India. The very latest tea machinery would be introduced, suitable buildings erected and the tea bush cultivated and plucked in the same manner as in India. The introduction of machinery would considerably lessen the cost of the tea and give China a better chance of competing with India. It would also improve the make and appearance of the tea. The reason to my mind why China tea has so fallen off in quality is simply that less attention is now given to the cultivation of the plant than used to be given formerly. The cultivator has received a lower price for his tea year by year. To meet this, instead of working up his cultivation more, so as to get an increased yield from his plant and thus reduce the cost of his tea and also improve its quality, he has spent less on cultivation, thus hoping to reduce the cost of his tea, entirely forgetting that by doing so he is really killing the goose that lays the golden eggs. The Chinese—at any rate in Formosa, the only tea district of which I can speak with confidence—have simply no idea whatever of pruning as understood in India. As a rule the tea bush is hacked down once in about six years, branches being left split halfway down in a most barbarous manner. Scientific pruning means really giving the tea bush a new lease of life. After a season's plucking, especially as done in China, there are a certain number of twigs which have a partially dead bark, and which if left alone will next plucking season only give very few leaves, and these of a thin sapless character. Cut away this partially dead wood at the end of the plucking season and next year when the sap commences to rise you will have a fine young shoot which will not only give you plenty of leaf but will also be good quality. I have always found the soil round a Chinese tea bush caked so hard that a fork could scarcely penetrate it. If this soil were properly loosened by forking round the bush more moisture would get to the surface roots of the bush, and thus ensure a more rapid rise of sap, which again would of course mean increased quantities of leaf. Again, the Chinese system of plucking is very bad. Chinese wait till in a plot of tea all the bushes have got a lot of leaf on them, and then men, women and children, sometimes the latter only five years of age, are let loose among the tea bushes. Nearly every leaf is ripped off the bush whether it is properly ready or not. Some of the leaves have of course grown too old and others are not properly ready. To get the best quality of leaf you must be constantly going round your tea garden, say once in 7 days or so, only taking the leaf which is perfectly ready and leaving the rest for your next time of going round. Practice alone of course can teach you this. If you allow leaf to grow too long it becomes hard and difficult to manufacture and does not make good tea. On the other hand if you pluck it too young you lose leaf, as if it had been allowed to grow a little longer, it would have weighed more. It seems to me a most extraordinary thing that such an intelligent race as the Chinese undoubtedly are should calmly sit down and allow one of their most important industries to pass away from them without making an effort to prevent it. If figures are true facts, unless the Chinese make some attempt to keep abreast of the times, at the present rate of yearly decrease in the China tea crop, about four or five years should see the end. There are plenty of tea gardens in India which can lay their whole crop down in London at an average cost of 7d per pound, some even less. China at present cannot do this. First let China try what can be done by a better system of cultivation and the introduction of the latest tea machinery, and then, if that is not enough to place her on an equal footing with India, the likin must be done away with.'—*China Mail.*

CEYLON TEA IN RUSSIA:

THE JAMES TAYLOR TESTIMONAL.

Kandy, Jan. 14th.

SIR,—I beg to transmit copy of letter from the Secretary to the Ceylon Association in London, together with the connected correspondence which is of public interest.—I am, &c.,

A. PHILIP,
Secretary to the Planters' Association of Ceylon.

LETTER FROM MR. LEAKE.

4, Mincing Lane, London, E.C., Dec. 24th 1890.

To A. Philip, Esq., Secretary, Planters' Association Kandy, Ceylon.

Dear Sir,—I have the pleasure to acknowledge receipt of your letter of 1st instant, informing me that the available balance of the vote of R5,000 towards Mr. Rogivue's mission to Russia is now R2,485·56. Of this I take due note.

I enclose a letter addressed to you by Mr. Rogivue together with a translation by him of an article from a Russian newspaper.

I am also sending you by this mail a copy of a letter addressed by our Association here to Lord Knutsford on the subject of the proposed increase of the amount to be contribution by Ceylon for military expenditure.

In respect of this document the Association has been greatly indebted to Sir Arthur Gordon for the care and trouble he has taken in drawing it up.

Wishing the Planters' Association and its officers many happy and useful years,—I remain, yours faithfully,

WM. MARTIN LEAKE.

P. S.—Our list for the Taylor Testimonial amounts now to £106 7s. The following names have to be added to the list:—

The Colombo Commercial Company, Ld. ..	£5	5	0
C. E. G. Hatherell, Esq.	2	10	0
Messrs. Geo. White & Co.	2	2	0
R. A. Cameron, Esq.	1	1	0
Sir G. H. D. Elphinstone, Bart..	1	1	0
J. H. Alexander, Esq.	1	1	0

"THE TEA FUND."

Moscow, 1st/13th December, 1890.

To A. Philip, Esq., Secretary, Ceylon Planters' Association, Kandy.

Sir,—I wrote you last on the 30th August/11th September and have since sent you through Mr. Wm. Martin Leake, London, my general report upon my mission in Russia, dated London, 15th October 1890, which I trust, has reached you in order and has given satisfaction to your Committee.

In London where I was for about three weeks, I was indeed very fortunate in making arrangements with an old and kind friend, Mr. P. G. Spence, who gave me, with capital credit, good advices and introductions, a very helping hand for the establishment of a business here in order to push by the *direct* trade the Ceylon Tea in Russia. I returned here about a month ago and I am now ready to open on Monday next, 3rd/15th inst., my office and store of the "Ceylon Tea and Produce Agency of Russia," for the sale by retail, wholesale and, or, otherwise, the speciality of "Ceylon tea" exclusively, which, as I have already written you, has never before been brought *as pure* to the reach of tea consumers in this country.

I am expecting in a day or two from London a first supply of Ceylon tea selected by me especially in London to suit the Russian taste, which, I hope, will sell rapidly, and I trust to have before long to report of having been successful in establishing a good and regular trade for this staple of your island.

A fact worthy of notice—which, I think, will please your Committee as showing that Russian merchants begin to take great interest in Ceylon tea—is that Mr. Popoff, Managing-Director of the large firm of K. N. C. Popoff Bros. & Co., Limited, whom, when I visited him two months ago, would not listen to anything about Ceylon teas, will now very shortly proceed to Ceylon with a Dr. (Professor of Chemistry) to analyse and taste them there, study everything connected with their planting and manufacture. This, of course, is a very important question and shows a good advance in the work done by me in Russia, as I am certain it will very soon lead to large imports of Ceylon tea into Russia.

Regarding the Reuter's telegram published in the Ceylon papers some time ago, "that the Russian Minister of Commerce proposed to establish a direct trade with Colombo and to introduce Ceylon tea into Russia," I may mention that the other day, on my return to St. Petersburg, wishing to interview the Minister of Finance, His Excellency M. Pichnegratsky, upon this important question, I had the good fortune of an audience with him, and he told me that the question has indeed been brought before, and agitated by, the Government, but that, up to this time, the best means to be adopted to do it, has not yet been found. However, he thinks that my establishment in Russia to sell Ceylon tea will greatly facilitate the matter, and he offered me every kind of protection and assistance in my enterprise. It is certain that the Russian Government will do anything to introduce into the country and protect an article of "*first necessity*" to the Russian public, which they can procure so much nearer than China and of better and *purer* quality. They have been stimulated by numerous articles published in the Russian press upon the subject, of which I send you the translation of one, which will perhaps interest your Committee and the public in Ceylon.

My work of "reclame" for Ceylon tea is, however, far from being completed. I shall have still large expenses to incur for advertisements, publications, etc. and will require all the money available for me in London, voted for the purpose by your Committee; and I hope that the latter will continue to support me, and be, later on, in a position to grant me, *if necessary*, some further funds to be spent for the continuation of my work.—I remain, dear sir, yours faithfully,

M. ROGIVUE.

[Translation of an article published on the 16/28 October 1890, in the *Moskowsky Wedamosty*, No. 286.]

THE NEW CEYLON TEA MARKET FOR RUSSIA.

A telegram from St. Petersburg on the 1st October 1890 says the following:—"The Minister of Finance and Foreign Affairs had proposed the establishment of direct commercial communication with Ceylon, in order to introduce Ceylon teas in our markets. It is contemplated, with this proposal, to get independent of English tea markets and to prevent the adulteration of teas which is more and more complained about as taking place in China and London."

This appears to us as a *word of gold* on behalf of Russian interests. Up to the present time, we Russians, on account of our little enterprising spirit, have bought, and are buying, have drunk and are drinking Ceylon and Japan teas (where we have no Russian agents) as *China teas*, through the medium of *English merchants*.

Japan tea differs very little from China tea. The Japanese have already, long ago, taken the greatest care and trouble with the planting and preparation of their tea; let us say more. The Japanese prepare their tea in a much cleaner way than the Chinese, and this may be accounted for by the smaller quantity they produce and also by the "go-ahead" spirit of the Japanese who are, no doubt, more civilized than the Chinese. In Japan there is no primitive dirty hand-work to be seen in the preparation of tea such as we have seen and heard as being done in China. In India and Ceylon the tea manufacture is still on a higher scale, and, as East India is of so near neighbourhood with the Chinese tea hills, it is quite comprehensible that they have taken so much of the Chinese ideas for planting and cultivating tea, the position of the mountains and the climate there being greatly in favor of good cultivation; the result has been therefore, that very fine qualities of tea have made their appearance from the hills of Hindustan. But, let us go further, and we see the tea cultivation in the island of Ceylon, with her peaceful and hardworking Sinhalese and the most

propitious soil, has, in every respect, gained the best ground, and there a plant gives 12 to 15 pounds of tea whilst the same plants in China would give only about 10 pounds, and this only stimulates the energy of the Sinhalese and induces them to venture largely in the planting on their own account.

It is not long ago that Ceylon began to plant tea, and already such enormous and splendid results have been gained, that capitalists have taken seriously the matter in hand.

The teas which are planted and prepared in Ceylon can certainly, with very few exceptions, be advantageously compared with the tea produced in the *best* Provinces of China, viz., Kin-Tschow and Quen-Fan. The tea from the Provinces Fau-Bohea-Dan and Panan-(Asjam-Tan teas are not to be compared) are positively inferior to Ceylon and even Japan teas.

Ceylon tea, however, cannot compete for flavor and aroma with the high grades of China "Monings"; but certainly they are equal to the best Souchongs and Paklings to be seen and so much praised in China. All these kinds have their first and best grades, and find a large sale in Europe.

England makes an enormous amount of money with her tea business, especially with Russia, where almost all the best sorts—which are here rather scarce and difficult to be found—are imported. Such a second-hand purchasing method is of course very detrimental to us; it only gives help to the foreign country who act as third hands in our tea trade and deprive Russia of a lot of benefit. In view of our unsatisfied requirements in high-class teas, which cannot be bought on the direct markets without the intervention of a third party, the offer of our Ministers to come to our help for direct communication between Russia and the Ceylon market is to be considered as *most valuable* and *desirable.* At any rate, the teas bought in Ceylon and shipped *via* Odessa, have the great advantage of a much shorter voyage. By its geographical position the island of Ceylon is certainly by half nearer Odessa than Shanghai, and again also nearer than Chankow, the only market where Russians operate. Therefore the development of the tea purchases in Ceylon would not only be very desirable for Russia, but also a very easy possible "factum" to attain. The question is whether our oldest Russian firms, who lead the tea business in Russia, will be enterprising enough and have the energy to develop in the proper manner this, *without doubt,* profitable business.

As a proof of the advantages to be derived from this business, we may point out the rather—so to say—secret way the English houses are speculating upon the Ceylon Tea Market. They conduct this business in such a clean, "robber-like," better said, "smuggling" style and fashion, and selling Indian and Ceylon teas for "Fooochow" teas, which, for aroma, taste, flavour and appearance are much the same. Packing also is counterfeited; and with the aid of English agents, the Ceylon packages, cards, labels, etc., are transformed to give them the appearance of Chinese "emballage."

All these deceive the clients and lead them to great errors in accepting quietly Ceylon "Souchongs" for Chinese "Monings."

Would it therefore not be better that we Russians, instead of helping the unfair trade and without allowing ourselves to be cheated and robbed, find the best remedy for buying direct the genuine and desirable merchandize, and thus save the medium of European merchants to whom we pay so enormous profits for "dark" commissions and who are so fond of speculating upon our pockets!

(Sgd.) G. KUDINOW.

Kandy, 1st December 1890.

To the Secretary, the Ceylon Association in London 4, Mincing Lane, London.

Dear Sir,—I beg to acknowledge receipt of your letter of the 31st of October with enclosure, and also yours letter of the 7th ultimo, which shall be duly submitted to the Committee at next meeting.

Meantime, I beg to state that your demand draft for R728·27 has had due protection, the amount being passed to debit of the grant made towards Mr. Rogivne's mission to Russia for the purpose of introducing Ceylon tea.

The cost of the remittance of the £150 on the 15th September was R1,786·17 at exchange of 1/8 13 16ths per rupee plus cost of message R22, and I enclose a memo. showing the different sums advanced up to date leaving an available balance at date, of say R2,485·56. —I am, &c., A. PHILIP, Secretary to the Planters' Association of Ceylon.

CHINA TEA AND RUSSIA:

The *Morning Post* thus concludes an article on Tea:—Though China has been beaten back from the commanding position it formerly occupied in the British tea markets, it must not be inferred that the total tea trade of the Empire has suffered in anything like the same proportion. It has declined, but the decline since 1886 has been only a little over 12 per cent in quantity, and about 7 per cent in value. It would be altogether premature, therefore to assume, as some rashly have, that China is on the point of losing her foreign tea trade. Russia, so eminently conservative in its preference for certain grades of tea, is beginning to take kindly to the Indian leaf, but there are still many countries, such as the United States, where people evince a strong objection to any but the genuine growths of the Flowery Land. Still, when a comparatively small island like Ceylon can raise and export in a single year over forty million pounds of tea it is evident that the Chinese cultivators will have to bestir themselves pretty actively, if they are to hold their own in those markets they still contrive to monopolise.—*L. and C. Express.*

NOTES ON PRODUCE AND FINANCE.

TEA COMPANIES' SHARE LIST.—We are now able to show particulars of fifty of the limited joint stock tea companies with headquarters in England and with a sterling capital. The list (which, however, does not yet contain more than about three quarters of the entire number of companies which exist), shows an aggregate paid up capital of nearly £5,000,000, a debenture capital of £500,000, and reserves of about £200,000 (or about 5 per cent on the capital).

TEA INCREASING IN POPULARITY.—The consumption of tea should be largely on the increase. At a West-end club no less than eighty teas were served on a single Saturday afternoon, and the tea shops of the Aërated Bread and other companies are usually full. Mr. Gladstone is a confirmed tea-drinker, and, unlike other people in this as well as in other things, finds a strong cup before bed-time an excellent sedative.

MINING AND PLANTING.—A company with the title of the Indian Gold Mines Company, Limited, has just been registered in Scotland. The capital is £50 000, divided into 5s shares. The object is to acquire, and work gold and silver mines, mineral and mining rights in India and elsewhere, and to grow coffee, tea, or cinchona. The first subscribers who take one share each are:—W. Anderson, Govan Factory, Glasgow; A. Breingan, Bank of Scotland, Helensburgh; P. Houston, C.E., 12, West Clyde Street, Helensburgh; W. A. Smith, merchant, 6, Hanover Street, Glasgow; W. H. Malcolm, writer, 119, St. Vincent Street, Glasgow; John Brown, Brandon Grove, Helensburgh; J. Mitchell, The Mains, Helensburgh.—*H. and C. Mail.*

ALOE FIBRE.—The last advices from Europe, shows a rise on prices, and has had for effect to revive the pretention of the manufacturers and would not be possible today to obtain good qualities under R250 to R260 per ton. Second qualities remain untouched.—*Mauritius Gazette,* Dec. 11th.

(Compiled by the Ceylon Chamber of Commerce.)

EXPORTS OF CEYLON PRODUCE from Colombo and Galle Annually during the past Ten Years.

COMPILED AS FROM 1st JANUARY TO 31st DECEMBER IN EACH YEAR.

		Coffee, cwt.			Cinchona	Tea	Cocoa	Cardamoms	Cinnamon.		Coconut Oil	Copra	Coconut Poonac.	Coconuts.	Plumbago.	Coir Cwt.			Ebony.	Deer Horns	Sapanwood.	Orchella weed.	Kitul Fibre.	Citronella Oil.	Cinnamon Oil.
		Plantation.	Native.	Total.	Branch & Trunk. lb.	lb.	Cwt.	lb.	Bales lb.	Chips lb.	Cwt.	Cwt.	Cwt.		Cwt.	Rope.	Yarn.	Fibre.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	oz.	oz.
Total Exports from 1st Jan. to 31st Dec.	1890	82,005	4,004	86,009	8,728,886	46,901,554	15,981	387,940	1,894,514	441,447	362,690	129,502	145,088	11907.969	385,754	9,379	75,030	35,967	9.373	2,288	1,259	308	2,397	14,559,075	108,787
Do. do. do.	1889	83,300	4,782	88,082	9,283,729	34,048,085	19,054	361,224	2,010,096	562,543	356,576	33,384	136,237	5004,541	475,516	9,778	82,183	31,356	3,572	1,988	1,080	547	2,771	10,263,433	100,234
Do. do. do.	1888	134.491	8,172	139,663	12,697,146	24,381,296	13,159	287,7241	1,685,183	473,840	306,974	138,578	103,182	5197,704	225.731	8,701	82,016	23,299	12,177	2,434	2,750	484	1,793	10,559,465	141,298
Do. do. do.	1887	169,275	8,569	177,844	12,599,847	13,800,645	16,301	344,918	1,634,602	342,416	314,842	137,853	101,084	10712,407	239,078	9,640	70,148	22,750	15,366	2,203	7,625	1,394	941	8.828,578	38,042
Do. do. do.	1886	176,483	6,645	183,128	14,838,402	8,111,137	14,855	240,581	1,733,563	617,777	242,741	129,794	71,528	*	217,412	7,159	69,001	13,130	23,951	1,040	1,898	677	2,589	6,745,794	167,283
Do. do. do.	1885	306,833	21,281	328,114	14,097,142	4,411,578	7,247	180,705	1,552,500	634,575	266,375	144,625	42,517	...	199,782	9,898	79,772	16,552	19,325	1,728	3,547	437	2,278	6,570,132	90.830
Do. do. do.	1884	287,565	11,007	298,575	11,923,190	2,403.095	9,606	76,259	1,711,375	562,219	387,817	189,306	26156	...	180,912	11,715	87,912	12,951	14,381	1,224	1,311	966	1,212	4,997,333	104,24
Do. do. do.	1883	294,468	14,160	308,628	7,296,671	1,641,810	4,166	42,928	1,927,914	376,727	348,895	150,078	†	...	261.872	13,619	77,518	19,817	18,234	1,497	10,280	1,016	1,734	3,916,398	81,324
Do. do. do.	1882	422,773	40,531	463,304	4,402,901	660,760	1,090	21.580	1,587,016	422 915	207,958	68,875	...	...	258,877	9,579	66,803	7,959	13,931	2,375	10,157	896	1,496	2,940,046	93,022
Do. do. do.	1881	409,016	29,157	438,173	1,320,454	350,179	79	13,567	1,500,122	331,798	201,054	22,183	...	...	241,728	10,092	40,487	5,717	26,400	2,055	10,502	1,036	778	1.950,501	97,009

* No records previous to 1887. † No records previous to 1884.

DISTRIBUTION FOR 1889 AND 1890.

COUNTRIES.	Coffee: Cwt.			Cinchona.		Tea.		Cocoa.	Cardamoms.
	Plantation	Native.	Total.	1890 Branch and Trunk lb.	1889 Branch and Trunk lb.	1890 lb.	1889 lb.	Cwt.	lb.
To United Kingdom ...	56716	121	56837	8003452	7906762	43756912	32510747	12145	156264
,, Marseilles ...	157	...	157	12500	...	1515	4866	80	..
,, Genoa ..	12	...	12	...	30412	3554	3121	...	...
,, Venice ...	118	232	350	70412	43411	2455	170	...	...
,, Trieste ...	7941	97	8038	546	..	4100	4542	...	7393
,, Odessa ...	32	...	32	...	..	275	...	...	...
,, Hamburg ...	296	..	296	730	...	43026	16925	913	1131
,, Antwerp ...	19	20	39	217919	48634	1600	[illegible]	..	...
,, Bremen ...	20	...	20	...	...	25578	14044	151	...
,, Havre ...	...	100	100	...	...	4761	3685	8	...
,, Rotterdam and Amsterdam ...	3	...	3	21384	91810	...	7140	55	...
,, Africa ...	16	...	16	...	..	42382	14047	..	..
,, Mauritius and Eastward ..	308	333	641	...	..	100666	16565	780	..
,, India ...	2705	1752	4457	...	...	144631	289637	...	218156
,, Australia ...	11738	1349	13087	...	..	2559901	1120094	9	40
,, America ..	1924	..	1924	401893	162700	2(4223	42252	1840	4956
,, Barcelona ...	...	..	...	...	...	1150	...	...	..
,, Stockholm ...	...	...	..	...	...	1703	...	...	..
,, Constantinople ...	...	...	..	...	...	3122	...	...	...
Total Exports from 1st January to 31st December 1890. ...	82005	4004	86009	8728836	9283729	46901554	34048085	15981	387940

COUNTRIES.	Cinnamon.		Coconut Oil.		Copra.	Poonac.	Coconuts.	Plumbago.		Coir: Cwt.			Ebony.	Deer Horns.	Sapanwood.	Orchella Weed.	Kitul Fibre.	Citronella Oil.	Cinnamon Oil.
	Bales. lb.	Chips. lb.	1890 Cwt.	1889 Cwt.	Cwt.	Cwt.		1890 Cwt.	1889 Cwt.	Rope.	Yarn.	Fibre.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Oz.	Oz.
To United Kingdom ...	1084837	237635	98156	118504	25316	11	11229123	163860	228316	...	44941	28167	3081	2285	882	308	2334	10619479	91836
,, Marseilles ...	105960	8800	3000	...	15812	5	...	...	...	...	923	...	...	...	...	...	...	...	601
,, Genoa ..	133265	45024	4330	3482	11071	...	...	1134	8	...	3938	...	...	...	...	...	..	93500	...
,, Venice ...	11100	11200	200	401	...	...	...	...	102	...	...	...	...	...	...	...	...	...	...
,, Trieste ...	8900	20048	18333	10239	...	...	2000	...	204	...	538	...	..	...	242	..	...	...	642
,, Odessa ...	...	..	8062	5415	16028	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, Hamburg ...	299082	91972	19986	9071	20728	112863	93284	35232	10137	...	2378	463	..	...	...	...	...	..	1029
,, Antwerp ...	22000	11312	1565	1492	...	23898	...	16545	11263	...	...	40	...	...	...	...	...	...	...
,, Bremen ...	29948	...	...	...	...	305	...	6895	1166	...	488	204	...	...	...	...	...	...	...
,, Havre ...	10000	...	2607	4578	...	...	...	...	...	...	...	...	...	...	...	..	...	..	...
,, Rotterdam and Amsterdam ...	...	11200	10	...	...	...	...	1616	437	50	2006	465	..	...	...	...	...	...	...
,, Africa ...	5000	...	28	34	...	...	451470	...	...	25	...	...	...	..	...	...	...	...	...
,, Mauritius and Eastward ..	28500	...	44837	7270	...	43	...	...	...	9156	2697	720	6292	...	...	...	...	...	...
,, India ...	12220	...	98921	93074	38586	7963	130592	640	236	56	7732	377	...	..	135	...	58	40752	...
,, Australia ...	9474	4256	1821	1944	910	...	1500	406	304	92	1863	5232	...	...	...	...	5	..	...
,, America ..	89228	...	61434	101072	1051	...	..	159426	223343	...	7026	299	...	3	...	...	...	3805344	1‹688
,, Barcelona ...	45000	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, Stockholm ...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	..	...
,, Constantinople ...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Total Exports from 1st January to 31st December 1890. ...	1894514	441447	362690	356576	129502	145088	11907969	385754	475516	9379	75030	35967	9373	2288	1259	308	2397	14559075	108787

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THE EXTIRPATION OF DELETERIOUS VEGETABLE GROWTH.

We had a call today (Jany. 20th) from Mr. R. I. Murchison, an Australian colonist, on his way back from India, where he has successfully interested the authorities in a specific he has invented for the destruction of deleterious vegetable growth. It is to be used freely for the extirpation of prickly pear and other troublesome growth in some parts of India. The specific is described by those who have witnessed its effects as quite wonderful for its speedy destruction of deleterious growths (vegetable) of any and every description from the biggest tree to the smallest grass. It has to be very carefully used, however, being a deadly poison, and also that it does not come near plants or trees that are meant to be preserved. The specific is supplied by the maker in the form of a powder, but applied in a liquor form. Mr. Murchison, who goes on by the S. S. "Valetta," expects to send an agent to visit Ceylon shortly, when fuller particulars will be made available and experiments no doubt undertaken.

CEYLON STAPLE EXPORTS AND THEIR DISTRIBUTION.

We call attention to the full and correct tabular statement given as a *Supplement* (page 592 *b*) today for our Staple Exports and their Distribution for a series of years. It is interesting to note in regard to *tea*, the increased proportion of our shipments diverted from the United Kingdom in 1890, thus,—

	1889. lb.	1890. lb.
Tea to United Kingdom ...	32,510,747	43,756,912
Do. other ports ...	1,537,338	3,144,642
Total ...	34,048,085	46,901,554

In 1889, the percentage diverted was 4 per cent; in 1890 it was close on 7 per cent of the total exports.

Summing up the exports to the different ports representing the European Continent, we find as follows:—

	1889 lb.	1890 lb.	Increase lb.
Tea for Continent of Europe direct	54,743	92,839	38,096
For Africa and Mauritius....	30.612	143,048	112 436
For America ...	42,252	204,223	161.971
For Australia	1,120,094	2,559,901	1,439 807
For India	289,637	144,631	145,006 (decrse.)

It is gratifying to see the largely increased export in the case of shipments to Australasia and Amrerica respectively, and we hope to see still greater progress made in 1891, while Russia should also take a big portion of our staple. The New Year has begun with heavy shipments and also with specially large sales of tea in Colombo, so that with sales rising to half-a-million lb. of tea per week, we can now offer ample encouragement to Russian or other large buyers to establish themselves in Colombo.

In regard to the distribution of our staples, the more notable facts are as follows:—the large share of our coffee taken by Australia which also figures for some cinnamon, coconut oil, coir and plumbago. America is a big customer for plumbago taking nearly as much as the United Kingdom and three times as much citronella oil, also a large quantity of coconut oil, some cinnamon, cocoa, coffee and cinchona bark. The Continent of Europe also takes large supplies of a variety of our products direct.

THE AMSTERDAM CINCHONA MARKET.

THE RICHEST AND AVERAGE BARKS.

The total quantity of cinchona bark offered by auction in Amsterdam in 1890 was 3,271,054 kilos., an increase of 58 per cent upon the quantity offered in 1889 (2,073,921 kilos.), and fully 2·25 per cent upon 1888 (1,435,647 kilos.) The following shows the composition of the Java barks, which form practically the whole of the Amsterdam supply:—

	1888. Kilos.	1889. Kilos.	1890. Kilos.
From Government Plantation	353,423	369,703	350,576
From Private Plantation ..	1,082,224	1,690,898	2,920,478

The average proportion in sulphate of quinine of the manufacturing barks was in 1888, 4·20 per cent; in 1889, 4·12 per cent; and in 1890, 4 per cent. The richest parcel of the year was offered for sale on June 5th. It consisted of 13 bales Ledger stem bark, in brokon quill, from the Government plantations, and analysed 9 42 per cent of quinine sulphate. The Dutch broker who sends us these particulars estimates the total quantity sold by auction in London during the year at about 5,000,000 kilos., averaging 2½ per cent quinine sulphate, and being equal, therefore, to about 3,938,000 oz. The total of bark sold in Amsterdam equalled (according to the published analyses) 121,420 kilos. (about 4,250,000 oz.) sulphate of quinine. If these estimates are correct, the combined auction sale of bark in London and Amsterdam during 1890 have represented 8,188,000 oz. quinine sulphate.—*Chemist and Druggist.*

CINCHONA FROM JAVA.

The exports of cinchona bark from Java during the period from July 1st to October 31st are by far the largest of any corresponding section of the last five years. This is all the more noteworthy as the increase is entirely due to the enhanced production of the private plantations. The Government plantations, in fact have this year only exported about one-fourth of their average July-October shipments. The following are the figures:—

July 1st to Oct. 31st.	1890	1889	1888.	1887	1886
Govt. plantns. Amst. lb.	64,208	231,410	226,235	238,246	168,550
Private plants. Amst. lb.	2,035,890	1,600,888	1,204,732	1,308,133	595,990
Total ...	2,100.098	1,832,298	1,430 967	1,546,379	764,540

—*Chemist and Druggist.*

PLANTING NOTES IN 1891.

(*Concluded from page 570*).

SOILS—FORESTS IN COORG AND IN CEYLON—SOIL POISON—INSECT PESTS AND INSECTICIDES—MANURES—THE GREAT OBJECT OF TEA CULTIVATION.

SOILS.—I will first begin by quoting from an article entitled "Forest Soils in "Coorg" from the *Indian Forester* of Dec. 1882, signed "Coorg (*Tropical Agriculturist*, Vol. II. page 734). The following facts regarding the forest soils in Coorg will be of interest; they somewhat upset the generally received theories as to formation of vegetable soil in forests:—

"Coorg, as will be seen by the map, is a little country occupying a small portion of the Western Ghauts, and jutting out a short distance in the Mysore plateau. The western slopes of the Ghauts are covered with dense lofty evegreen forests into which jungle fires never penetrate. On the east is a belt of deciduous forest, varying from four to six miles in width, which have been constantly burnt through by jungle fires for time out of mind; and indeed we may infer that this has been going on for centuries. Do not we all know that the natives of India always burn the forests on principle in order to get an

early crop of young grass for their cattle; in fact they consider it a duty they owe to themselves and their neighbours to burn off the forests as completely as possible. Is it likely that this is a habit developed of late years, and not rather one as old as the first settlement of inhabitants in the country? Then that the forest has been much in the same state for the last 500 years is proved by the existence of teak trees of that age which evidently grew in the same conditions from the first as they are doing now. The almost invariable wide centre rings two to three in the first inch seen in these ancient trees, would appear to give direct evidence of the young plant having been constantly burnt down every year, every time sending up a larger shoot until a shoot is produced, large enough and high enough to defy the jungle fire. This is the process to be seen going on under our own eyes. A teak plant grown under other conditions in the forest, would have six or eight rings in the first inch. We may then, I think, infer that these deciduous forests were constantly run over by fire 500 years ago, and have been ever since, and probably were burnt for centuries before that.

"Now what is the result on the soil? In the one case we have the virgin ever-green forest of the Ghauts in which fire never penetrates, constantly giving back to the soil a vast amount of vegetable matter in the shape of leaves, wood, and bark. On the other hand high deciduous forest, the vegetable matter from which has been constantly burnt by jungle fires for centuries. According to preconceived notions there would be a thick layer of the vegetable mould in the former and next to none in the latter. As a matter of fact the very opposite is the case. In the Ghaut forests there is seldom more than an average of 6 inches of vegetable mould—whereas in the deciduous forests there is a thickness of from one foot to 28 inches. It must be distinctly understood here that I am not speaking of scrub jungle but of high and fairly deciduous forest.

"In open scrub jungle the formation of vegetable mould is naturally very much less, and, as might be expected, if the subsoil is examined, it will generally be found to be poor. No doubt there are other circumstances conducing to the poverty of the jungle, and amongst these chiefly the want of rain, and these causes act and re-act on each other.

"The difference in the soil of ever-green forest and deciduous forest is very distinctly marked on the lower western slopes of the Ghauts. Here up to an altitude of 800 to 1,000 feet, the slopes are covered with semi-deciduous forest of *Terminalias* and *Lagerstrœmias* mixed with the large thorny bamboo, the greater portions of which are burnt almost annually. In coming down the Ghaut roads the difference in the soil of the road cutting is at once noticed; between the thin greyish layer of the vegetable mould of the ever-green, and the thick black layer of the fire-devasted deciduous forest, I have noticed the same thing on the Carcoor Ghaut from Nilgiris to Calicut. A few days ago in going through a coffee estate on the Ghauts, I passed a place where the soil was a rich deep black resembling what is seen in the Eastern deciduous forests, strongly contrasting with the absence of mould in surrounding portions of the estate. It had been lately dug, and on looking closely, I noticed a number of pieces of charcoal mixed with the soil. On remarking on this I was told the place was the site of a toddy-drawer' house and garden and the rich black mould was evidently partly produced from burnt vegetable matter.

"The fine coffee estate in what is called the 'Bamboo' district in Coorg owe their flourishing condition to the rich black vegetable soil of the deciduous forest: In the first days of coffee planting, every one thought that the soil of the dense Ghaut forests must be everlasting as compared with the deciduous, but the fallacy of this supposition is proved by thousands of acres of abandoned coffee estates on the Ghauts, whereas estates planted fifteen years ago in the "bamboo" are as flourishing as ever and shew no signs of decay. Supplies come up as well as when first the estate was planted, showing that the soil retains its vigour. In the Ghauts it is not so, the exhausted soil refuses to rear the young plant, so that vacancies cannot be filled up. And it is remarkable that this is not only the case on steep slopes, but also on flat places and hollows where there can be but little wash. I trust those observations will bring out those of other observers on the subject."

You put a footnote:—"On the other hand was it not the case that a large proportion of the bamboo estates in Wynaad were killed by borer?" Borer came because men attempted to grow coffee in a dry climate without shade; and in a specially dry year terrible were the ravages of that worm. But that was no fault of the bamboo. You will find it a good rule in selecting land whether high or low—*follow the bamboo.* This applies in Kalutara and Udugama.

As to the article above quoted the facts are borne out in other parts of India, and are they not borne out in Ceylon? Where are the evergreen forests? Ramboda, Nuwara Eliya, Dimbula, Dikoya, Maskeliya, Nitre Cave, Laggala,—in fact all those forests beyond the reach of chenaing, unswept by forest fires, and deluged with heavy rains. Then you have the deciduous forests of Uva, Dumbara, Matale, and Kurunegala, and between those extremes is the border land of evergreen forest land converted into scrub by constant chenaing in the past. We have thus 1st ever green virgin ghaut forest (example Laggala), 2nd evergreen forest converted into mana grass or scrub by chenaing (numberless example.) 3rd—deciduous forest; 4th—cultivated lands (not paddy). But now in applying this to Ceylon we must take the climate of our ocean island into account and we find the surface of most lands stimulated by the heat and moisture so that natural osmotic action is promoted without the help of a forest covering. Much land in Ceylon with its light scrub covering would be dried up and gradually rendered infertile in a dry climate.

Then we have other varieties of soils. There is Matale East where the whole soil is of a rich nature even in steep mountain slopes. Here coffee flourished and tea is now flourishing. Then you have the Ambagamuwa valleys where coffee was a great failure on account of the cold clayey nature of the soil. Then in the lowcountry the three tea districts—Kelani, Kalutara and Udugama—have to be considered. Kelani Valley is a long straggling district composed of steep valleys running up from the river where the soil is not rich, but, along with the steamy forcing heat, forms a good ground for the necessary evergreen growth of tea.

Kalutara also lies along a large river, and though the soil is of a poor description yet it has a firm subsoil which tea likes. Some of the flats in Kalutara are very fine.

Udugama is a district by itself literally and figuratively.

When you leave Galle you come on fine deciduous forests at Kottowe which are the remnants of old original lands preserved by the Dutch, and in a way also preserved by the British. This land proves that the remarks of the Coorg writer quoted above do not apply to *low*country forests, because when once the original forest is felled, the fierce heat of the Ceylon lowcountry extracts the nitrogen and available manurial elements of land where the soil is not rich, and gradually the land is covered with a poor scrub or that poisonous *kekilla* fern. As you approach Udugama you find all the original forest has many years ago been destroyed except in small pieces here and there. Large expanses are covered with the kekilla fern and show where a large cultivation was carried on 80 or 100 years ago by natives who were driven away in the first place by fever and elephants and in later days by the law prohibiting chenaing. The soil in Udugama is poor by reason of the tremendous amount of sand with which it is clogged. The roads and drains are full of white sand. It is also full of what would be considered the very thing for tea—namely *iron.* The streams run red with the iron ore. But read *Tropical Agriculturist*, vol. II., page 508:—"Soil Poison.—Nearly all soils contain iron; it is this that gives them their reddish colour. But iron has two oxides. One of them, containing the least amount of oxygen, is soluble in soil water,

and is therefore readily taken into the roots of plants Copperas, or green vitriol, is composed of this low. or protoxide of iron and sulphuric acid. On exposure to air for a time, this low oxide takes in more oxygen, forming what is called sesqui-oxide of iron which is insoluble in water. The subsoil which has never been stined to admit the atmosphere freely, contains the low oxide, and when first turned up, if sown or planted soon, the roots of the crops take in this poisonous soluble compound of iron and are much injured if not killed outright.—*American Agriculturist*

Now may I apply all this to tea cultivation? As far as I have seen the best soils for tea are those that have a stiff subsoil into which the tea tap-root descends, like the Ghaut evergreen forest tree, and yields a large return of leaf or flush. If there are good manurial qualities in this soil all the better. Then the next best soil is that of Matale or Haputale of high manurial quality and of good consistency combined with favourable climate.

Then the next is that of Kelani Valley and Kalutara, where the subsoil has good consistency, and though the manurial qualities are deficient, yet the climate is steamy and forcing.

After this comes the general run of old coffee lands in the Central Province, where there are pockets and valleys which possess favourable conditions for tea. But in all this will it be said that manure is not wanted? Government must help the planting enterprize and allow manure to be carried at very low rates. You will see in a few years, that a universal revival of manuring (fish or poonac) will arise in the Ceylon tea districts. Let me quote *Tropical Agriculturist*, Vol. II. page 418:—

"It is assumed, but not proven, that electricity nitrifies the azote of the air in the interior of the soil by a union with hydrocarbonaceous matters: or effect a similar end in the interior of plants by their starch sugar, &c. We know however that the azoteous matters in the soil can be nitrified, but that is not an augmentation of richness. * * *

"The extent of vineyards in France is 4½ million acres. One quarter of this area is invaded by the phylloxera, and the new ravages of the insect are estimated at the rate of 200,000 acres annually. Three official remedies are recognised. Sulp. carbonate of potassium and sulphuret of carbon, submersion, and American stocks for grafting on the affected vines. To these must be added a relatively high manuring. It has been found that purely nitrogenous manures, as wool-clippings, ham-parings, dried blood, oil cakes, &c., develop the vine at the expense of the fruit; but farm yard manure, or a composition of potash salts, soluble phosphates, and a proportionate dose of azoteous matters have the opposite effect."

Here now—"*developes the vine at the expense of the fruit.*" That is what tea planters have to attend to. They have to develop the tea bush at the expense of the seed by applying purely nitrogenous manures such as fish, oil-cakes, &c.; while cacao planters must use farmyard manure to develop the valuable fruit on which their efforts depend. The *Tropical Agriculturist* is a treasury of richness to the planter who is beyond the reach of libraries. It is a library in itself from whose shelves one may gather much knowledge if he only looks for it.

There were Mr. Carter's experiments which are well worth studying. In reference to those Mr. Hughes says (*T. A.*, Vol. V., page 465):—"In my remarks upon Mr. Carter's experiments I pointed out the probable reason why the results of the application of castor-poonac had proved more satisfactory than those obtained from the use of bone-dust, namely, that, inasmuch as nitrogen was the principle manure ingredient required by the tea plant, it was only reasonable to conclude that the fertilizer which supplied the largest proportion of this valuable constituent in a form suitable for assimilation was the most suitable and economical manure for tea plantations." See the rest of his remarks. He concludes as follows:—"That tea plantations will require manure sooner or later, there can be no doubt whatever, and the poorer the soil and the more forcing the climate (lowcountry planters please attend), the more immediate necessity will there be for its application, hence the importance that planters should select these manures which are likely to prove practically the most economical."

Mr. Carter recommended manuring at the rate of 24 cwt. of poonac per acre every three or four years. The great object in tea cultivation is to do everything in our power to keep the soil moist and prevent drying up or pulverization of the soil which will check the necessary evergreenness of the tea bush.* Thus forking and digging are inadvisable in ordinary soils, still more in light sandy soils. But in very adhesive soils digging is necessary to enable the soil to *retain* moisture. You all know how sticky clayey or loamy soils are in wet weather and how hard and metallic they are in dry weather, these soils should be dug, forked, turned over and kept broken. Why? Because you introduce large quantities of air between the lumps, and this prevents the process of evaporation by the sun in dry weather, from drawing every drop from the soil. On the other hand it prevents saturation and stagnation of the surface in wet weather, which tends to rot the fibres of the plant. Thus it is only an adhesive soil that should be forked or dug. Of course with a soil like Udugama where there is a poisonous protoxide of iron present the turning up the soil and admitting air will do good. Mr. Cochran (*Tropical Agriculturist*, Vol. VII, page 569) says: "Protoxide of iron is converted into the harmless or beneficial peroxide by aerating the soil by mechanical working or by liming." *Liming!* surely this is the only case where lime is wanted. Lime is the bane of a tea planter. It promotes long inter-nodes of wood and rapid run to flower and seed, because it renders food more quickly available to the plant, and this is useful for fruit-growers. Why is it that on an old coffee estate which has been converted into a tea estate, those fields where crops were heaviest in coffee will not grow tea satisfactorily? Some might say that was because coffee had exhausted those fields. No, the reason is that generally the soils where coffee did not flourish are the soils where tea yields leaf most freely. Of course, this rule does not apply all round, as there are places (Dambullagalla and Nayabedde) which were mines of wealth in coffee and are mines of wealth in tea. That is because, taking for granted the soils are rich, yet they contain constituents and meet conditions which are favourable to tea growth, namely—they have nitrogenous elements freely available and the subsoil is sufficiently adhesive. Thus you have the necessary vigour which would go to fruit or seed if allowed, but, being checked, allows a full crop of leaf to be taken. But a soil like this must be supplied with lots of nitrogenous manure to make up for this heavy exhaustion of certain elements.

Thus flat land, adhesive yet manurial subsoil (well forked), forcing damp and hot climate is the best for tea.

Flatness saves disturbance of the main roots of tea which are sensitive of injury.† Adhesiveness of the soil (if forked) with good manurial properties promotes evergreenness and luxuriant foliage.

Damp heat is known everywhere to be a forcing agent in promoting vegetation. I have, perhaps, wearied you by these imperfect notes. But if I have even in a small way, helped to arouse the Ceylon planters to the necessity of manuring, my object will have been attained.

"1873."

THE WYNAAD PLANTERS' ASSOCIATION has suggested to kindred bodies that a prize of at least £20,000 should be offered for a practical cure for Hemileia, the cause of coffee leaf disease. The French Government has a standing offer of 300,000 francs for a practical cure of phylloxera.

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* In coffee we had to check the evergreenness of the bush to force out fruit buds

† To prove how sensitive the side roots of tea are it is a fact that young tea plants will not tolerate "trimming" the roots when taken from a nursery; whereas this treatment benefited young coffee plants. In forking adhesive land care must be taken not to go near the plants.

COLD WATER WITHOUT ICE.

The following method of obtaining a constant supply of cool water at all times is described by *The Railroad and Engineering Journal* as being in general uso in Hanover, York County, Pa. The town, says the *Journal*, is closely built up and without any system of drainage, so that the water from the wells is unfit to drink. Some years ago these reasons led to the introduction into the town of a supply of very excellent water from a large spring about three miles distant. This water is brought through iron pipes, and when it reaches the consumer in summer is warm, while the water in the wells is cool. For this reason many of the inhabitants drink the well water, and as a consequence, typhoid fever is a prevalent disease in that community. In order to obtain pure cool water, not impregnated with lime, some of the inhabitants of the place have adopted a plan which is so simple and gives such excellent results that it is worthy of general adoption wherever there is a water supply other than wells or springs.

The plan is as follows:—A cylindrical galvanised sheet iron tank, 12in. in diameter and 4 or 5ft. long, is placed in the bottom of a well. This tank is then connected by a galvanised iron pipe with the water supply pipes, and another pipe is carried from the tank to the surface of the ground. or to any convenient point for drawing water, and has a cock at the upper end. The tank is consequently always filled with water from the water supply, and being in the bottom of the well, the water is cooled off and acquires the temperature of the well; so that that which is drawn from the tank is as cool as well water, and is without any of the impurities with which the latter is contaminated. The water drawn from the tank in one of the wells in the place named had a temperature of 56deg. when the thermometer in the atmosphere above stood at 76deg.

This method gives an abundant supply of cool water during the whole summer, and can be adopted in all cities, towns or in the country. If a well is available it can be used; if not, by simply digging a hole in the ground, deep enough so as not to be affected by the surface temperature, and burying the tank, it will answer equally well. This hole might be dug in a cellar or outside the building. If the water has any impurities in suspension, such as mud the tank should be made accessible so that it can be cleaned separately.—*Invention.*

JAMAICA SORREL.

There is one plant that would well repay a more general cultivation than it now receives—at least from a housewife's point of view. That is the Jamaica Sorrel plant. It grows readily from seed, stands transplanting well, bears prolifically, and the fruit when cooked in jelly, or as sauce, so closely resembles cranberries as to almost deceive an expert. It is quite as good and would prove a most excellent substitute for those delicious berries. The plants in this neighbourhood are now just blooming and in two or three weeks will be ready for culinary purposes, and unless injured by cold, will continue bearing till sometime after Christmas. The plant should be cultivated by every family where a delicious jelly, or sauce, is suddenly appreciated.—*Tampa Journal.*

[Ordinary sorrel comes on exhausted ground in Australia and after a time is said to restore fertility. But what is this Jamaica sorrel?—ED. *T. A.*]

OLD King Coffee is once more making an effort to raise his head. A Hapu'ale proprietor tells me that this season he will obtain a better crop than he has had during the past 12 years, and in consequence, he and other planters have ceased planting up more tea. I also hear of an estate in the Rangalla district with good coffee prospects, so good indeed that an abandoned block is to be re-opened with the old staple! I hope anticipations will be realized.—*Cor.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.)*

LONDON, Jan. 1st.

ESSENTIAL OILS.—In Citrouella there has been some business today at ⅞d per oz. for bottles; tin oil is quoted at ¾d to 13-16ths per oz.

COCONUT OIL.—Steady of sale, with some business in fine Ceylon, delivered at 29s; and for near at hand 26s 9d to 27s is quoted. Cochin oil on the spot is held for 33s 6d to 34s; and for near at hand 32s. c.i f. terms.

QUININE.—Since our last report this article has been in good request, and prices improved slowy until today, when the market again became noticeably weaker. The transactions reported since the middle of last week include about 100,000 to 120,000 oz. German-bulk quinine (B & S and Brunswick) in second-hands, at from 12d up to 12¾d per oz, the latter price being paid yesterday but today it would probably be possible to buy at 12¼d per oz. This morning it was announced that Messrs. Howards & Sons had reduced their quotation by 1d per oz, their brand in bulk being reduced to 1s 5d, and in vials to s 7d per oz. The announcement of this reduction appears to have created some surprise. For delivery, the transactions which have become public total up to about 50,000 or 60,000 oz second and first hand German bulk (B & S and Brunswick), at 12¼d up to 12¾d per oz for near-at-hand to March delivery, and the B & S agents report also a sale (for consumption) of 5,000 oz at 13d per oz, early delivery.

HOW TO CAPTURE PORCUPINE.

Has Mr. Nock, who is so much troubled with porcupine in Hakgala Gardens, ever tried the native dodge (a trench baited) as related by "Tennent"? Here is the passage from his "Ceylon":—

Porcupine.—The Porcupine* is another of the *rodentia* which has drawn down upon itself the hostility of the planters, from its destruction of the young coco-nut palms, to which it is a pernicious and persevering, but withal so crafty, a visitor, that it is with difficulty any trap can be so disguised, or any bait made so alluring, as to lead to its capture. The usual expedient is to place some of its favourite food at the extremity of a trench, so narrow as to prevent the porcupine turning, whilst the direction of his quills effectually bars his retreat. On a newly planted coco-nut tope, at Hangwelle, within a few miles of Colombo, I have heard of as many as twenty-seven being thus captured in a single night; but such success is rare. The more ordinary expedient is to smoke them out by burning straw at the apertures of their burrows. The flesh is esteemed a delicacy in Ceylon, and in consistency, colour, and flavour, it very much resembles that of a young pig.

THE FORESTS of "Darkest Africa" strike the imagination; but they are not the greatest on the earth. In the Empire of Russia there are 494,248,000 acres of forest; in Africa, according to Stanley's calculation, there are only 224,000,000 acres.—*Home paper.*

COL. BELL'S MEMO. ON MADRAS IRRIGATION.—Some copies of a memorandum by Col. J. H. Bell, R. E., late of the Madras Public Works Department, on the Irrigation Works of General Sir Arthur T. Cotton, K. C. S. I., R. E., in the Madras Presidency, have been sent out by the former officer now in England for distribution to officers and others in Madras Public Works Department. Colonel Bell in forwarding the copies has informed the Chief Engineer that the memorandum was drawn by him at the special request of Indian Engineer officers. Colonel Bell, we believe, is the only officer who was personally cognisant of the details of all Sir Arthur Cotton's projects, and it is highly desirable that his memorandum should be put into the hands of all Engineering officers. The volumes have been supplied gratis, and have been acknowledged with suitable thanks by Government.—*Indian Engineer.* [Copies ought to be obtained for the Ceylon Irrigation Officers.—ED. *T. A.*]

* Hystrix leucurus, *Sykes.*

SAMBAS IN WESTERN BORNEO.

(Translated from the "Indische Mercuur" for the "Tropical Agriculturist," by Mr. John Dent-Young.)

SEARCHING FOR GOLD—SAMBAS AND ITS DESCRIPTION—CONNEXION OF NETHERLANDS WITH SAMBAS—THE SULTAN—AGRICULTURAL UNDERTAKINGS.

There was a time when the very name of California caused excitement. Huzza! for California! the cry gold! gold! resounded on every side. Later on Australia was the centre to which all eyes were turned. There again was gold, the attraction which drew vast crowds to that part of the globe. And now whenever we take up a journal, we find gold to be the great exciting cause of the multitude.

Numerous are the associations which are now working gold mines with more or less success in South Africa, and multitudes are presenting requests to the Resident of West Borneo for permission to set on foot scientific examinations of sites for gold mines. No less than thirty-three such applications have been tendered in Sambas alone, whilst in other parts of the Residency 60 concessions have been applied for. Public attention had hardly been turned on Sambas before requests poured in for such concessions. Thanks to the ready co-operation of the Resident and the Sultan, but little formality is necessary in making those requests. Frequently the simple mediation of a friend has been sufficient. As a preliminary, the application is made for permission to institute a scientific search for gold, for the Government insists on this, and it is only after the lapse of three years that the permission is exchanged for a notarial contract. In this way the danger of sinking capital in a bottomless pit is greatly diminished if not altogether avoided. During these three years there is surely time to make such an inspection of the ground as can establish proof of its being able to repay the cost of working or not; if unfavourable, no further loss is incurred, than the outlay for making the inspection, a risk inseparably connected with all such undertakings.

But we are speaking of the district of Sambas as if it was a well-known locality to each and all, whilst some of our readers may be desirous of knowing more about the possession, for which reason we propose to give the following brief sketch of it:—Sambas is under a Sultan dependent on Netherland, situated at the northern extremity of West Borneo; it is bounded on the north by Sarawak, on the east and south by Landak, on the south by Mampawa, and on the west by the sea, or to be more precise it stretches from Tandjong Datu in the north-west to the Duri river which forms the southern boundary, to the north and north-east it is bounded by the mountain chains of Krinabang-Semadju and Kewai, whilst on the south and south-east it is separated from Sanggow and Landak by the Kurum, Bajang, Mint and Pandang mountain ranges. Sambas comprehends the basin of the river of the same name, from its mouth to its confluence with the Sambas Kiri and Kanan.* The Sambas river takes its rise in the above-named southern chain of mountains, and falls into the sea at Pemangkat after traversing the Chinese settlement of Larak, becoming navigable at Ledo. To the north of the Sambas river rises the mountain of Palo, well-known for the iron of superior quality that it used to furnish.

Sambas, the chief town of the State, lies at the confluence of the abovenamed two branches. It presents to the visitor but little beauty for his admiration. It contains however a good place of entertainment, so that anyone wishing to make some stay there will find no difficulty in obtaining a lodging. Sambas is at the same time of easy access. Every month a steamship belonging to the Ned. Ind. Steam Navigation Company leaves Tjandjong (Chanjong) Priok for Pontianak *via* Biliton. Soon after the arrival of this ship, a steamer belonging to the transport contractor leaves the port according to the terms of the contract for Sintang, whilst one of the ships belonging to the Indian Marine leaves for Sambas *via* Singkawang. The vessel of the transport contractor leaves Pontianak on the last day of every month for Singapore *via* Singkawang and returns by the same course.

Should the traveller not wish to go direct from Batavia, he should take his passage on board one of the fine steamships built expressly for this service, the "Ban What Soon" or the "Ban What Hien," the former of these two has plied for years between Biliton and Pontianak, and the latter has for some months taken her course *via* Sambas. The development of the mining and cultivating operations on the concessions will decide if steam communication can be continued. As the two lastnamed vessels are bound by no contract, they do not adhere to any particular time, and therefore the transit *via* Batavia is to be preferred, as well as on account of the necessary formalities which have to be fulfilled. Let us then select this route, go over to Pontianak, and thence make our way to the Sambas river. As we enter its mouth, we see what appears to be a vast lake, as the river for some distance inland is of great breadth. Both sides are bordered by thickly-wooded hills, amongst which the lofty Peribangan rears its head, overtopped in height by the more distant Bukit Pemongkat, whose dark summit and light-green sides are recognized at a great distance. On the right bank towers on high the Kalimbu, a so-called saddle mountain. To the left of us is the Chinese settlement, while in our front, to the north-east the Bukit Raja extends its crown towards the heavens, whilst its foot stretches away like a tongue of land ending in the rocky Kalimbu. But let us make way for the words of the admirable writer on Borneo's West Coast:—"Further eastward a noble panorama opens to the view, endless forests fringed on the seaside with tjemaras (chimara trees) and extending beyond the Kumé and Batong Mountains, which appear like grey masses defined in sharp outline against a cloudless sky, with the Sambas river shining through occasional openings like a silver band. Here bright green rice-fields and gardens, next clumps of coconut palms and other fruit trees, lie like islands spread about in this of sea green. In the midst rises the Bukit Pemangkat. Its summit is clothed with heavy timber, its slopes are planted with cnau palms, or are terraced for rice cultivation. From all parts flow rivulets; here, rushing wildly over bare crags whence they are led to water the neighbouring rice-fields; there, winding gently amongst magnificent orchids, and picturesquely intwined, climbing plants which serve to protect man and beast; westward lies the boundless sea before us, always in motion, always full of life. And through the green waters shine huge stones and rocks with which the coast is strewed."

A sandbank in the embouchure of the river, alas! prevents the entrance of ships of greater draught than 12 feet; higher up the Sambas presents no features of importance except to the lover of the picturesque. "Besides the Chinese Settlement at the base of the Pemankat," thus continues the Heer Veth, "nothing beyond the town is to be met with, as a sign of habitation not a speck of cultivated ground. All is morass and wilderness, amongst which trees of amazing height force their way upwards, and the silence of the forest is seldom disturbed by the traces or presence of animal life. The small river (a branch of the Sambas) presents at its frequent windings most lovely prospects often not less remarkable for their fantastic forms than for their tropical luxuriance. There is the home of the orangutan (Malay—*orang* man, *utan* forest), and of thousands of smaller apes, here the buzzing of myriads of insects unites with the song or divers noises of birds, whilst dangerous crocodiles lurk for their prey amongst the water-plants on the banks."

The country between the river Sambas and the already mentioned river Duri is intersected by numerous small streams, most of them having their sources in the Mandor districts.

Amongst these and further inland the Chinese Settlements are spread about, the inhabitants of

* Kiri and Kanan are the Malay words for right and left.

which are occupied in the cultivation of rice near the coast. This district is considered the most productive in the western division; still further, inland, the dwellings of the Chinese who are employed in mining operations are met with. This is the scene where the sanguinary drama of the Mandhor insurrection was enacted, which originated in the obstinate resistance of the Chinese "Kongsis" against the steady extension of the Netherlands authority.

The connexion of Netherlands with Sambas is of ancient date. The first treaty with this State was concluded by the East India Company in 1609, and stipulated chiefly that the Company would defend the Sultan against all foreign enemies, particularly against the Spaniards and Portuguese. The Sultan on his side engaging to exclude all other European nations from intercourse with his country, and to concede the exclusive right to free trade with his State to the Netherlanders, with the right to build a fort for the protection of their persons and possessions, and ensuring them the monolopy of the diamond trade from which even the native traders were excluded. In 1816,* after the restitution of our Eastern possessions by England a new agreement was made with the Sultan, by which he recognized the sovereignty of Netherlands, and ceded all the revenues of his Sultanate and of its tributary states to the Government, in return for which he was to be paid a fixed income, the amount of which depended on tho full tax levied on the Chinese and on the Dayaks. In 1819 this arrangement underwent further changes, containing amongst other stipulations a clause by which the Government was placed altogether in the power of the Netherlands. After further amplifications and renewals, the present existing Charter was established in 1848 with the following principal clauses:—The State of Sambas forms an integral portion of Netherlands India, and is immediately under the authority of the King of the Netherlands, locally represented by the Governor-General, and accepts his State as a fief from the supreme government and exercises authority in concert with officials appointed by the Government. The successor to the throne according to adat (ancient custom) is elected, the election being subject to the approval of the Governor-General; all the revenues including the poll-tax paid by the Chinese, rents, customs and public property of all kinds belong to Government, the Sultan receives an allowance of R12,000 guldens a year (12 guldens being equal to £1 at par). In the interior of the State the Sultan is bound to provide reasonable maintenance for all the members of the princely family, the village contribution of labor shall be at tho disposal of Government for the public service; the Sultan is to appoint the native chiefs in accordance with custom, and in consultation with the chief Netherlands official, he is to maintain law and justice; afford all help to the law courts and to the police, and decide minor matters of police and justice. Europeans, Chinese and foreign Easterns are subject to the legal authority of the Government.

The Sultan will do all that is possible to suppress "head cutting"† the slavetrade, piracy on the sea and coast; he will do all he can to abolish the pawning, system, and will give all practicable aid to encourage trade, navigation and all useful branches of industry; and to render the utmost help in case of shipwreck, and to shipwrecked persons; he will not enter into any compact with foreign princes or people, or permit them to establish themselves in his State, but will give intimation to the Netherlands authorities immediately on the occurrence of any attempt at so doing. He binds himself on oath in writing to fidelity to the King of the Netherlands; and lastly, he acknowledges a debt on his State to Netherland of f48,080, and will submit to all such measures which the Government may deem necessary for the recovery thereof. As may be seen from the foregoing, Sambas is a well-regulated State, in which the security of person and property is as well guarded as in any European country. The present Resident, Heer J. van Nieuwkuijk, lately replaced by the Heer Tromp, both most excellent men, and the present Sultan Mohamed Tsafiudin, Knight of the Netherlands Lion, an enlightened man, do their utmost to promote the welfare of the country.

As we have already mentioned, there are many persons desirous of establishing themselves in Sambas for the purpose of cultivating the ground as well as for working gold mines. Up to the present time the latter pursuit has been exclusively in the hands of the Chinese, whose appliances are of the most primitive nature, yes they are the people in whose footsteps Europeans are about to tread. Applications for concessions have for some time past been pouring in. Thirty-three mining concessions have already been granted, but of these only three have passed into formal contracts. The others remain still, only permits to examine the ground in order to ascertain its adaptability for the proposed purpose. This examination, as we have already said, lasts only for three years, at the end of which period it must be changed for a notarial deed, or be given up. As soon as a contract has been signed, the rent becomes payable, at an annual rate of 10 cents per bouw and $2\frac{1}{2}$ per cent on the gross produce. So that those who enter into the contracts naturally limit the extent of the concession to the land which has been found absolutely necessary.

We have just said that hitherto the gold was colleeted principally by Chinese who obtained it chiefly by washing, being ignorant of any other mode of working the quartz reefs. These gold washings are situated on the slopes of hills or in their immediate neighbourhood, and are connected with a flow of water which is essentially necessary for the work. When a site has been selected, every effort is made to turn a sufficient supply of water into it, no trouble or expense being spared in the construction of an efficient watercourse.

The nature of the gold deposit, whether mixt with sand, incorporated with quartz or in veins, necessitates the adoption of different processes for its collection. The Dayak goes to work in the most simple manner. When the burong (bird in Malay) Soho has indicated to him where the gold lies, he washes away the earth in a wooden trough until nothing remains but the particles of gold. The Malay goes a step further; he digs a pit, and gathers all the gravel and earth, and washes it out, whilst the Chinaman goes to work in different ways, according to the formation of the site. If the gold stratum lies above the level of the water, and if the water supply is sufficient, as is the case near Pagong in Montrado, all the surface earth is dug away, and the stratum of gravel or silt thus exposed is carefully washed in broad wooden *kotaks* (troughs) arranged in steps, then removed into small tubs and rinsed, and from the residue the particles of iron ore are removed by means of a magnet.

Where the gold containing silt lies below water level a sufficient number of channels are dug, which are kept dry by means of a (tali-ayar) water-rope acting like a chain pump. As soon as the sought-for stratum is reached, it is removed gradually into troughs, and washed until the gold is separated. Should the gold lie in veins, the stratum through which the veins run is broken into pieces with sledge hammers, until the depth of water puts a stop to the process, the ore is then picked out and reduced to

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* Which had been held since 1811.—*Note by Translator.*

† Potong-kapala, a time-honored institution amongst the Dayaks, is a kind of duel in which two men at a time engage in a fight with heavy swords, sharp as razors, the delicate attention of each is confined to the endeavour to chop off the head of his opponent; other wounds are not allowed to count, so tho entertainment goes on until one of the players loses his head and tho game at the same time. Until "the grinding tyranny of tho Dutch" interfered these exhibitions afforded great amusement to crowds on all State occasions; in the case of the combatants it used to be considered, that the more the merrier, and a successful stroko of the gollok or razor-like sword was "mighty pleasant to behold."—*Note by Translator.*

powder in wooden mortars, and then washed. It need hardly be pointed out that in this last method there is much gold lost: in the first place, the sorting of the ore is done by the eye; secondly, the appliances are of the roughest kind and very inefficient; thirdly, it is only practicable to a very little depth.

The European engineers will manage matters better. A large quantity of machinery has already been introduced. That the gold strata are frequently rich is evidenced by the amount of gold produced with very defective appliances and most clumsy methods by the Chinese, who obtain as much as yields about 200,000 guldens (or guilders) a year. With the method described they get 0·012 per cent of gold from the quartz.

If the above data are not exaggerated, colossal results may be looked for; even if the proportion of gold should turn out to be only one-third of what it is said to be, the mines will be well worth the trouble and expense of working, and with good management will yield considerable profits.

AGRICULTURAL UNDERTAKINGS.

Thus far we have confined our observations exclusively to mining enterprize; we now propose to consider the question of the application that have been made with reference to the extension of cultivation in these regions.

The number of persons desirous of obtaining land for agricultural purposes is also great. The newspapers from India give us the names of those who from time to time continue to swell the list of proposed agriculturists, and so it will go on until all the western division shall be parceled out.

In Sambas alone 55 concessions have been granted, of which 25 have been confirmed by contract entered into. That more contracts have not been made is explained by the fact that within a year after the completion of the contract, the rent becomes due for 10,000 bouws, 2,000 guldens is the sum that has to be paid as rent, for the second year 4,000, for the third year 6,000, for the fourth year 8,000, and for the fifth year 10,000, without any regard to the fitness of the land for the proposed cultivation or to the circumstance of its being uncultivated. [The contractor has to pay the stipulated rent whether he cultivates or not.—*Note by Translator.*]

Of the twenty-five concessionists who have passed over this difficulty, many of them are members of a Syndicate at Singapore, the name of which does not appear in connexion with the undertaking. The contracts are in favor of the person who enters into them. Amongst these there are several who have begun to work on their own account.

The produce of the cultivation thus begun is up to the present time not very satisfactory. The reason for this is to be sought, not so much in the constitution of the soil, as in the great difficulties which the planters have to overcome. In proof of this, may be mentioned that two persons who are members of the Syndicate have produced tobacco of excellent quality, which was received in town with high approval, but that an outlay of 80,000 guldens was made before the result was obtained.

Another concessionary established a tobacco enterprize on a large scale, which according to Heer K. (*Bat. Nieuwsblad*, 15th July 1890), promises very well, but he had his full share of troubles. In the first place he could not obtain sufficient labor. The Chinese coolies displayed gross ignorance as cultivators, as well as unwillingness, and when at last help came from Singapore, it was found to be of little use. Shoemakers, tailors and clerks were sent, but no people who knew anything of planting. These were soon found to be very difficult to manage, and were continually deserting. To trust exclusively to Dayak laborers, seemed to him to offer as little hope of success. He has therefore endeavoured to engage a better class of Chinese work people.

But all this does not disprove the assertion that Sambas has very certainly a good future, if these difficulties can be removed out of the way. More than once has the soil of this region been examined, and the conclusion has always been arrived at, that it must be regarded as in every respect most favourable for cultivation. The soil has been found well adapted for the planting of sugarcane, tobacco, coffee, rice, pepper and many other products, whilst there is a great variety of good timber ready to hand, which will amply repay the cost of felling and transport.

We furnish the above as explanatory of the map which accompanies this number.

As will be seen by the map, Sambas is very favourably situated. It should be remembered that the divisions there marked indicate chiefly the lots where permission has been awarded for mining inspections, or for which requests have been tendered for concessions for cultivation. Only one contract has been entered on to the south, 20 miles from Sambas, when Heer P. van Dijk has commenced operations. Further south, near Mentrado, Mr. Gordon has brought a tract of land under cultivation on similar terms, and a little further north Mr. Liddolow has in like manner commenced operations near Benkajang; whilst twenty-five cultivators have contracted.

Too much importance should not be attached to the absence of the names of many of the concessionists; in a latter map of concessions, for it is more than probable that many of those whose names now appear on the map, may withdraw from the undertakings. Our readers are not to consider this article as written for the purpose of urging the cultivation of Sambas, or for encouraging the enterprize. Our only object is to convey a correct idea of the present condition of the country, and nothing more. It is certain that great expectations are entertained regarding Sambas. It is said even that applications have been mdo to the Sultan for the formation of a railway, but we are not in possession of any particulars.

CULTIVATION OF FIBROUS PLANTS IN CEYLON.

Our correspondent, W. A. D. S., mentions in his last letter the fact that the stem of the Bandakai yields a good fibre. We think that fact is well known, but what is necessary to turn it to useful account is the quantity and cost of the fibre produced by the plant. In other words, the information wanted is the economic value of the plant for the production of fibre. Capital is a scarce commodity in Ceylon, especially amongst those people who are most in need of new industrial resources. Such persons are not likely to be attracted to risk their slender means in experiments with plants of which they know only vague and indefinite possibilities. They want some fair prospect of gain, based upon ascertained results, not on mere chances. In countries where there is a large amount of unemployed capital seeking investment, the case is different, but even there it is not easy to induce people to make experiments otherwise than upon definite estimates of profit. In this country the only chance of obtaining a satisfactory trial of a new product rests with the School of Agriculture, or other similar institutions possessing means of experimenting independently of a remunerative result. It is quite possible that the Bandakai plant might yield fibre profitably, but our correspondent, W. A. D. S., does not give any data for estimating the economic value of the plant for its fibre, and therefore leaves the matter practically just where he found it.

The same may be said of the Sunflower plant as of Bandakai, namely, that it yields a strong and serviceable fibre, as well as an abundant crop of nutritious seed, but the fact that both these plants are extensively cultivated for their fruit, and not for the fibre they are well known to contain, tends to show that the fruit is a more valuable product than the fibre. We think the School of Agriculture would do a good service by testing the value of both these plants for the fibre they yield. The result of their experiments would be valuable, if not conclusive as to the question whether either would pay for fibre cultivation in Ceylon. In the meantime, we could not advise the expend-

iture of capital on either by anyone who could not afford to risk a loss by the venture.

The Niyanda fibre is superior to either of those just mentioned. It is of great strength and flexibility, and is of beautiful texture. It is not cultivated anywhere, so far as we are aware, but grows wild in some parts of the Island, and is largely employed by natives, who collect it and prepare the fibre for mats and other useful articles. Whether it would repay regular cultivation is, however, just what we should have expected our practical friend, W. A. D. S., would tell us. In the absence of the necessary data by which to estimate the chance of successful cultivation, it must be relegated to the same category as the two plants first mentioned. Over them, however, it has the advantage of being already in considerable use, and of therefore possessing a certain economic value.

Hitherto, notwithstanding the large number of fibre producing plants that grow freely in this island, and the high value of the fibre some of them produce, the attempts that have hitherto been made to produce fibre, as a commercial enterprize, have resulted unfavourably, except in regard to Coir and Kitool fibre, which we number amongst our regular exports.

Aloes, plantains, and other plants have been repeatedly and extensively tried, without success. Cotton promises to do well, and possibly some other of the numerous plants that are profitably cultivated elsewhere may hereafter be cultivated successfully in Ceylon, but the difficulty as regards nearly all of them, is to free the fibre from the pulp in which it is formed. This is not peculiar to the plants of Ceylon, but is common to nearly all. The separation and cleansing of the fibre is therefore in almost all cases the chief part of the work, and the essential feature of success in regard to the profitable production of fibre.

It is possible that the forcing climate of this island may cause the fibres that are formed in the tissues of the plants that produce them to adhere more closely to those tissues than in countries where growth is periodically interrupted by winter or other change of season. Be that as it may, the art of separating and cleansing the fibres of Ceylon-grown plants has not hitherto been successfully acquired, and until that cardial difficulty is overcome, the cultivation of fibrous plants is not likely to be remunerative.

Considering the importance of the subject, as shown by the magnitude of the jute industry in India, the extensive coir manufactures of this Island, and other similar industries, it is one to which the School of Agriculture might give particular attention, especially as the students possess the advantage of a chemical laboratory and a fair elementary knowledge of the science of chemistry, which may be expected to suggest or to supply solvents suitable to aid in the process of separating the fibres from the pulp in which they are formed.

It may be here remarked that the failure of sugar as a profitable product, in all those parts of Ceylon where the cane has been cultivated, is due to the forcing climate and its influence in promoting an uninterrupted growth. The ripening process, in which the saccharine is formed, is unduly delayed for want of an effective check to the flow of sap. The experience of the past attempts to cultivate sugar profitably in Ceylon suggest that any future trial should be made in parts of the Island where there is a definite growing season and a marked period of comparative stagnation of growth. Possibly; the same may apply to the cultivation of those plants in which the fibre is formed in the substance of the tissues. Here again, the School of Agriculture could do good service by making trials in some of the numerous stations where they carry on their useful and practical operations in different parts of the Island.—Local "Independent."

PLANTING IN GUATEMALA.

Sarsaparilla.—Among the products which find shipment from the Atlantic coast, of which the town of Livingston is the port, sarsaparilla should be mentioned. The exports of this article during 1887 were 51,311 lb. This product was in such demand at one time, and commanded such good prices, that the natives gave up almost every other kind of employment and devoted themselves entirely to its production. During the past two years, however, the price has receded by one-half, and the demand has largely fallen off. It grows readily from cuttings of the indigenous vine, and, as the natural supply is giving out on account of careless digging, it is possible that the cultivation could be made profitable, even at the present low prices.

Drug Cultivation.—The Government is offering a good many inducements to agriculturists to take up the cultivation of economic plants, including many varieties of drugs. Anyone desirous of cultivating sarsaparilla, rubber, or cacao, and not having land for the purpose, can, on requisition, be put in possession of a suitable lot. The following rewards are offered to agriculturists who at the end of eight years can show healthy plantations of cinchona (calisaya or succirubra):—154*l.* for 1,000 plants eight years old to the first cultivator, 77*l.* to the second, 36*l.* 10*s.* to the third, and 15*l.* 10*s.* to all others. A premium of 4*l.* for a term of three years is given for every 150 lb. of indigo grown and made in the country, and at the end of ten years after commencing the cultivation a reward of 11*l* 10*s.* for every thousand gum trees planted out, of five years old.

Cochineal.—The industry of cochineal-raising has almost entirely disappeared from the country. For thirty years cochineal was the principal article of export, but now what little is grown is used for native consumption.

Coca.—A quantity of coca seed was imported from Peru in 1888, for distribution among the people in a suitable zone for its growth; but the result was unsatisfactory, from the bad quality of the seed, and fresh means are being taken to extend the cultivation of this plant.

Pepper and Cinnamon.—Pepper and cinnamon are grown in the department of Alta Verapaz; good seed has been imported from Ceylon, and planting is extending in the fertile district, while good results have also been obtained in the department of Escuintla, where a few plantations have been made.

Vanilla, Cinchona, &c.—The vanilla plant grows wild on the mountains all over the country. The quantity of the vanilla is good, but though it figures as an export it is not cultivated for that purpose. Peruvian bark has proved a failure, and the cost of introducing the tree has been practically lost. Indigo works are subsiding in the country; a few still exist in the east, but though means are taken to encourage them, only 93*l.* of indigo was exported in 1888.—*Chemist and Druggist.*

EUCALYPTUS GLOBULUS.

Of all the 150 varieties of eucalyptus, the common blue gum is the most useful and the most important tree for Southern California. It does not thrive in Florida; the cold spells of winter cut it down or stunt its growth; but on the Pacific Coast, from Eureka to Tia Juana, a distance of 800 miles it is a stately, mighty advance agent of our now civilization. Twenty years ago our plains were absolutely treeless—desert-like, parched and brown, lifeless almost—a picture of despair. Then the first boxes of seedlings were imported from Australia and sold at the public auction in San Francisco, at $5 a tree.

Today the precious little giants sell for one cent a tree. Remi Nadeau, a recently departed genius deeply regretted by his friends, was one of the first men to appreciate the value of the eucalyptus as a fuel tree. He conceived and executed the gigantic project of planting 1,200 acres of sandy land at Florence to blue gums. Over one million trees in one plantation! To-day is a stately forest of mighty trees, towering tall and straight 150 feet, a monument to the enterprise of our bygone friend. Every third year the trees are cut down, yielding 60 cords of 4 foot wood to the acre, worth $6 to $7 a cord standing, or $7 to $8 cut and corded; the net income is therefore $420 for

the three years or $140 an acre per year. And every time these are cut, a new forest springs up from the old stumps, and there is no expense to be incurred after the first year for either plowing, cultivating or irrigating, for deep down into hidden water courses in the earth does the blue gum send down its thirsty roots, even thirty feet where the water is so far below the surface; and it makes its giant growth in the poorest sandy wastes of our river washes, drawing its sustenance from the atmosphere through its wealth of evergreen leaves. What a perfume, what a tonic is inhaled by the beautiful foliage of the eucalyptus when night brings rest and coolness to our plains. Fevers lose their terror and malaria departs with a creeping horror, where the rustling, whispering groves of stately eucalyptus waft fragrance over the home. Pour boiling water over the blue gum leaves and drink the powerful tonic. It is equal to quinine to dispel the terrors of sickness. The contagious atmosphere of the sick room today is cleaned by sprinking on the floor of an essential oil "Eucalyptole," extracted by the science of the chemist from the resinous leaves of *eucalyptus globulus* or *eucalyptus amygdalina*. Years ago winds swept over our treeless, unresisting plains. The "Northers" were a terror to the farmer and orchardist. Today miles of eucalyptus surround our fields, line our avenues and encircle our orchards. They act as powerful wind-breaks, protect the tender buds of our fruit trees from the March winds, and yield an abundance of fuel, where of yore the shiftless Mexican vainly hunted for dried manure or brea to light his smoky fire. Stranger, imagine the beauty of our avenues of blue gums twenty or a hundred years from now, when the trees average over 200 feet in length, over 15 feet in diameter, as they do today in their native land, Australia. Our southern plains will rival then the wonders of the Yosemite in their big trees. The question of fuel and timber supply is becoming more serious, more important from year to year on the Pacific Coast, as the giant redwood yields to the greedy axe of the all-absorbing lumber trusts.

If you own any lots or acres that are idle or unproductive, plant them in blue gum. A town lot 50 x 150 feet will grow 200 trees 6 feet apart, and every tree when 5 years old, is worth $1·50 for fuel in a city. Your lot thus yields $300 in five years or $60 a year, and fifty acres in blue gums will yield you an annual income of $7,000. The mayor of Los Angeles is planting 150 acres of blue gums this season; they will yield him a handsome revenue a few years hence. The mighty forest will be an object of beauty to behold and a source of perpetual income to his heirs. Let the good work proceed of planting the beautiful blue gum in forests for fuel, around orchards and fields, for wind breaks and for ornament in sightly avenues, affording shade and shelter along our streets —*Rural Californian.*

THE COST OF GROUND PEPPER AND THE ADULTERATION ACTS.

At the public sales this week light shelly Penang Black Pepper has been sold at the price of 4¼d. por lb., the lowest point that has been touched for a long time past. According to the test analysis published in the catalogue (as is now usual for Penang Black Pepper, under the recent arrival contract form), this parcel weighed 3lb. 7½ oz. por gallon, and contained 4·53 per cent of dust, &c. The following are the regulations in the arrival coutract form which regulate this analysis:—

"(1) The following to be the standards of quality:—Class A, Heavy, weighing 4lb. 13 oz. per gallon measure; B, Fair, weighing 4lb. 5 oz. per gallon measure; C, Fair Merchantable, weighing 3lb. 13 oz. per gallon measure; D, Light, weighing 3 lb. 5 oz. per gallon measure=Dust 3 per cent.

"(2) The term dust to include stalks, stones, clay, and other foreign matter.

"(3) For the purpose of ascertaining the proportion of dust, 5 per cent. of each mark shall, in the first instance, be sifted through a No. 9½ sieve, in galvanised iron with round holes (one of which is held by the General Produce Brokers' Association). Of the sifted Pepper fifty pounds of each mark shall be hand-picked free from stalks, stones, clay, and other foreign matter, and the percentage of impurities so found shall he added to the percentage of dust as ascertained by sifting. These operations to bo performed by one of the customary docks or wharves.

"(4) Should the Pepper be found to contain more than 3 per cent. of dust, any excess up to 2 per cent. shall be treated as valueless, and allowed to the buyer. Should the additional 2 per cent. be exceeded, the buyer shall have the option of taking the Pepper with allowance for any dust in excess of 3 per cent., or of invoicing back the parcel to the seller at the fair market value of the day of the quality contracted for, plus a fine of not less than 2 per cent., and not more than 10 per cent., the value and fine to be fixed by arbitration in the usual manner. Any fraction below half per cent. to be neglected, any greater fraction to carry the next higher integral.

"(5) For the purpose of asertaining the weight of a parcel, the average sample taken by the Dock Company or Wharfingers shall first he freed from dust and other impurities, and then filled into a gallon measure, shaken down as closely as possible without pressure, and struck off and weighed, the average of three fillings to be taken for 25 tons or less. This operation to be performed by the selling Brokers, who shall state the separate weights of the three tests on the out-turn accounts.

"(6) In the event of seller or buyer being dissatisfied with the return of the weighing by the selling Brokers, either of them shall have the option, within a week from the date of the first selling Broker's return, of calling for a fresh average sample to be drawn, and the matter shall he referred to arbitration. The arbitrators to test both the landing and re-drawn samples, and the testings to be averaged, and the result to be considered final. Should the Pepper have been re-shipped before a fresh sample is asked for, the first weighing shall he taken as final.

"(7) Should the Pepper be found to weigh less than the minimum of the class named, the buyer shall take the same with an allowance of one quarter per cent. on the sale price for the first ounce or fraction of an ounce, and a further one-half per cent. for the second ounce or fraction over an ounce, but should the deficiency in weight exceed two ounces, the Pepper to he invoiced back to the seller at the fair market value of the day, of the quality contracted for plus a fine of not less than 2 per cent., and not more than 10 per cent., the value and fine to he fixed by arbitration in the usual manner.

"(8) Samples to be drawn of not less than 28lb for parcels of 25 tons or less. In ease a second sample be required, half of the total quantity drawn to be returned to the bulk."

No machine has yet been invented which will entirely remove earth or sandy matter from Pepper, and, in fact, practical experience shows that in some cases screening or brushing machines, by the forcible pressure used in this process, do harm instead of good, by breaking up pellets of earthy or clayey matter that a sieve would to a great extent remove unbroken. The only plan that the trade can adopt, therefore, to avoid risk of prosecution under the Adulteration Act, is to buy whole Pepper as free from dust and dirt as possible, and the analyses published with each parcel of Penang Black enable them to a great degree to do this. It appears, however, that the test analyses carried out by the London docks and wharves do not mean that all the dusty matter consists of sand and earth.

Penang Black Pepper is more largely used for grinding than other descriptions and heavy Acheen can now be bought at 5d. per lb., and West Coast Penang, which is heavier Pepper, at 5¼d. to 5½d. por lb., according to weight per gallon and percentage of dust. In the best cases the percentage of the latter would be 2 to 2½ per cent. The cost of grinding, including barrels, and loss in weight in grinding

and between warrant weights and re-weights, would add ½d. to ⅜d. per lb. for expenses, without any profit to the wholesale dealer. The usual charge for grinding and barrels is ⅜d. per lb., and there is a considerable loss between warrant and delivery weights, and a further loss of weight in grinding. In our opinion, Penang Pepper with 2 per cent. to 3 per cent. of dust is the lowest quality which it is desirable to grind, if the public are to have pure Pepper. The first cost without profit to the dealer of this quality just now is about 5⅞d. to 6⅛d. per lb., ground and packed in 1 cwt barrels. The finer qualities of Black Pepper, such as Tollicherry, Alleppy, and Malabar are selling whole on the Market at 6¼d. to 6½d. per lb. If barrels are seperately charged for (which is not, however, usual in the Spice trade), a corresponding reduction could be made in the quoted price.

It is well for the retail trade to have these undoubted facts clearly in view, for, with the infinitesimal difference the sale of doubtful Pepper could possibly make to them in the course of the year, the risk of a prosecution, and possible conviction, for selling adulterated goods, is obviously not worth running: even if they desired to take such a risk, which is not the case by any means. Indeed, in the "poivrette" and other cases, the retailers undoubtedly bought in entire ignorance of the adulteration. Nor would a guarantee from the wholesale grinders or dealers that the Pepper was pure be much satisfaction to a self-respecting man if he found that adulterated Pepper had been sold to him, under the proper price for a genuine article.

It is true that, instead of selling Ground Pepper at ½d. to ⅜d. per lb. *above* the cost of the whole corns, which is the lowest legitimate margin, Ground Pepper is habitually sold at about 1½d. per lb. *below* the first cost of the whole, or apparently about 1½d. under its proper relative value. When buyers purchase Ground Pepper at prices apparently below those that are practicable, it would be a good plan if they asked for samples of the Whole Pepper used, and insisted on being supplied at the same time with an equivalent parcel of whole Pepper, at say, ½d. under the ground price. Such quotations are explained by the parcel consisting wholly, or in great part, of the husks given by the process of decortication of Black Pepper. These are produced when the outer shell of Black Pepper is mechanically removed in order to make White Pepper from the Black Pepper corns. How far the sale of ground husks as ground Black Pepper, is legal, without a declaration to that effect, has not been settled nor has it been decided whether the public analysts would pass husks as Pepper. The husks in any case must contain a very much greater percentage of the dirt that was originally in the parcels, and the buyers would thus run more risk with them than with parcels ground from the whole Pepper as imported. In the meantime the retail grocers may feel perfectly certain that if they are offered ground Black Pepper, at present market values, under 6d. to 6¼. per lb., that it is either sold at a loss, or that dirty whole Pepper has been used, or that husks have been mixed with it, or that it consists of husks altogether. In the present state of the law there seems no objection to the admixture of husks, so long as the buyer knows the fact.

It is satisfactory to find that the action taken some time back has stopped the admixture and adulteration of White Pepper with the so-called "Long" Pepper, The price of the latter has fallen to about 25s. per cwt., at which under, its own name, the Spice in question has a legitimate sale and use. When used for adulteration the value was run up to 70s.

A good deal of almost open adulteration, is still carried on by mixing ground Rice, worth say 1¼d. to 1½d. per lb., with White Pepper. This admixture if carried to any great extent can be detected by the dirty, greyish tint, and also by the weight of the sample, ground Rice being heavier than pure Pepper. A strong magnifying glass or weak microscope at once shows this adulteration, as the Rice grains look like bits of quartz or camphor in the Pepper. A further test is to pour boiling water on two samples, one the suspected one, and one of real ground White Pepper. The difference in the aroma of a sample adulterated with Rice Flour can at once be detected, and the latter also often goes into a starchy pulp or into a more solid mass.—*Produce Markets' Review.*

ECHOES OF SCIENCE.

Whether or not a plant draws the nitrogen it requires to form its tissues directly from the atmosphere, is a question which has been much debated. Herren Hellriegel and Wilfarth, two German chemists, have already shown that seeds sown in calcined soil produce only puny plants, having little nitrogen in their substance, but if they are watered with a few drops which have drained from a vegetable mould they begin to prosper, and secrete nitrogen which apparently can only come from the atmosphere. The water supplies it appears, the microbe necessary to abstract the nitrogen from the air. M M. Schlœsing and Laurent, two skilful French chemists, have now put the question beyond all reasonable doubt by a memoir read before the Académie des Sciences, Paris.

They have found by careful experiments on plants grown in a confined atmosphere, that these abstracted nitrogen from the air around them to the extent of 30 cubic centimetres, and analysis of the plants practically rendered this quantity back again. M. Laurent has also succeeded in cultivating the microbe which fixes the nitrogen and defined the conditions of its existence. The most unexpected fact brought out is that this proto-organism flourishes above all in a medium deprived of nitrogen in combination; nitrates in particular appear to hinder its development. —*Globe.*

NOTES ON POPULAR SCIENCE.

By Dr. J. E. Taylor, F.L.S., F.G.S., &c.,
Editor of "Science Gossip."

There is only one agent we are acquainted with which will in a great degree replace the energy produced by the consumption of coal—ELECTRICITY. At present we generate it chiefly from coal, although it can of course be produced by chemical action. But there are certain great mechanical forces in the world, generated by solar energy now, just as coal originally was. The first of these is the wind. Few people have formed an idea of its enormous and as yet unused energy, except in the case of our ancient and picturesque windmill. But the windmill is an archæological suggestion of a future rescue. Imagine a head of wind a mile across and a hundred feet in height—the latter a mere trifle. Then multiply this by the force moving over the path it takes. There are millions of horse-power represented thereby. Irregular in its action though the wind is proverbially said to be, our storage batteries (as yet but in the infancy of their development) can accumulate much of this now almost wasted energy. The latter can be stored and drawn upon at pleasure. Further, think of the as yet almost unused energy represented by streams, especially tidal rivers. One of our chief electrical engineers has shown that the phenomenally high tide of the Severn, coming and going twice a day, represents more energy than all the cotton mills in Lancashire and Yorkshire. The Americans have already commercially and scientifically formulated a scheme for utilising Niagara. Some day, perhaps, somebody will formulate a method for enlisting the energy of the tides all over the world in the service of man. The energy represented by the vast consumption of coal every year in every part of the globe is a mere trifle compared with the energy of moving wind, flowing streams, descending waterfalls and cataracts, and the always certain ebbing and flowing tides. A French engineer is already making propositions to supply electric power to Paris by utilising the ebbing and flowing tides of the coast; and he is constructing, at Havre, two large basins, into one of which the sea at flood-tide will flow over a dam, whilst during ebb it will flow out of the

other dam into the sea again. There is a similar antiquated dam on a very small scale at Woodbridge, in Suffolk, only it turns a mill-wheel instead of working a dynamo.

A new and ingenious milking machine is being tried at the Duke of Portland's dairy farm. It is a simple contrivance, being merely an iron pipe and a hand-pump. Connected with the pipe is a length of indiarubber tubing. The latter has teat-cups for clasping the cow's teats in such a manner as to be air-tight. When the cups are applied to the "coo," the pump can be worked by a lad, the air exhausted, and the milk drawn from the animal, all four teats giving out at hte same time. The cow is thus milked dry in about eight minutes, and is said to behave herself decently during the operation.—*Australasian.*

JAPAN is about to enter the field as a producer of indigo. The soil and climate of parts of the island are stated to be favorable to the cultivation of the shrub.—*American Grocer.*

TWENTY or thirty Europeans and about two thousand Africans are working on the Congo railway to Stanley Pool. It is thought that the railroad will suppress the slave trade better than the army.—*Ibid.*

Rev. Dr. E. E. Hale, in the *Commonwealth*, suggests that cheap sugar may drive out the taste for whiskey. It supplies the hydro-carbon needed to take the place of whiskey. He says that the Spaniards are addicted to the use, almost every hour, of sugar and water as a beverage.—*Ibid.*

OUR EXPORTS.—As much as 892,984 lb. of tea, 661 cwt. coffee, 111 cwt. cocoa, 12,446 lb. cinchona bark, 3,353 cwt. coconut oil, 1,601 cwt. plumbago, 14,720 lb. cardamoms and no cinnamon (nor "chips") sum up the week's exports in Ceylon products. We suppose there must be some further additions to be made before 1890 season is closed: we ask because Messrs. Forbes & Walker in their circular the other day gave 46,310,295 lb. as the total export of tea for 1890, whereas the Chamber today only make up 45 943,469 lb.

RINGING TREES.—Hartig gives the following account of his experiments in ringing the bark from trees. Trees from which a ring of bark has been taken are affected differently, according to the kind of tree, and the thickness of tho trunks. Some die rapidly, while others remain alive a long time. The author has already expressed his opinion that most likely root-structure has considerable influence on plants submitted to this operation, and any prognostications as to the probable effects must be guided by the fusions or inosculations which may have taken place between the roots of the tree under treatment and those of the untouched trees around. If the roots, after the cessation of nourishment, and of growth, and the formation of new rootlets, soon lose the faculty of absorbing water and mineral substances (Pine, Spruce Fir, &c.) from the soil, the death of the plant must be the direct consequence of the operation, unless there are underground unions with the roots of neighbouring trees by which life is sustained until the dead part of the trunk becomes impermeable to water. But if the roots do not entirely lose the power of absorbing water even in their oldest parts—as in the case of Maples, Lime trees, &c.—the trees continue to thrive without underground union so long as the denuded trunk is in a fit state to allow of the passage of water. The following interesting example will therefore be easily understood. A Spruce Fir tree a hundred years old, divided at a height of about twenty-three feet from the ground into two almost equal trunks. In 1871 a complete ring of bark was removed from one of these trunks. The tree was cut down in the winter of 1888—9; the two crowns were quite green, those of the ring side being rather less abundantly provided with leaves. The roots of the injured side had ceased to grow but in spite of that, the ringed branch continue to grow for seventeen years, nourished by the roots of the uninjured side.—"*Annales Agronomiques,*" Nov. 25, 1890, p. 526.—*Gardeners' Chronicle.*

SAVE ALL THE WOOD ASHES made on the farm and buy more from the neighbours. They will make an excellent fertilizer for onions, and are beneficial to all fruit trees, no matter on what soil they may be growing. Coal ashes, also, are said to be valuable, not only for walks, but to mix with hard, stiff soils, to which they give a softer and more porous nature.—*Indian Agriculturist.*

A CANADIAN DAIRYMAN describes a plan by which he gives his calves fresh new milk, and yet manages to have a good supply of butter from his milk. The idea is simple enough, and well worth consideration. The plan adopted is as follows: At milking time two large vessels are put outside the byre door, one marked "dairy" and the other "calves." One half of the milk given by each cow, viz., that first drawn, is put into the vessel marked "calves," and the other half, viz., that last drawn, is put into the vessel marked "dairy." This latter half is found, on being tested, to contain from two thirds to three-fourths of the cream. The calves have the advantage of being fed with milk warm from the cow; at the same time they are reared at a moderate cost, as their allowance of milk does not contain much cream.—*Indian Agriculturist.*

CEYLON EXPORTS AND DISTRIBUTION 1891

COUNTRIES.	Coffee cwt.			Cinchona	Tea.	Cocoa	C'moms.	Cinnamon.		Coconut Oil.		P'bago.
	Plantation	N'tive	Total.	1891 B'nch & Trunk lb.	1891 lb.	cwt.	lb.	Bales lb.	Chips lb.	1891 cwt.	1890 cwt.	1891 cwt.
To United Kingdom ...	4629	4629	4629	208838	3023712	2262	15367	71565	4221	9:3	...	6734
" Marseilles	...	...	...	...	...	39	...	6500	...	...	...	...
" Barcelona	...	...	...	...	50	...	...	36000	...	...	...	...
" Genoa	...	...	...	...	...	...	...	...	...	...	...	...
" Venice	...	...	...	...	...	...	...	...	...	...	...	...
" Trieste	372	...	372	...	...	...	...	...	...	951	...	...
" Odessa	...	...	...	...	...	...	...	...	...	...	...	...
" Hamburg	...	...	...	...	...	...	...	22500	...	1304	...	956
" Antwerp	...	...	...	...	...	...	...	...	...	200	...	...
" Bremen	...	...	...	...	...	...	...	...	...	...	...	...
" Havre	...	...	...	...	...	...	...	...	...	...	...	...
" Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	...	...
" Africa	...	...	...	...	975	...	...	...	...	...	...	...
" Mauritius and Eastward	...	...	...	...	...	...	...	...	...	...	105	...
" India	42	...	42	...	4432	...	6064	...	...	387	990	...
" Australia & New Zealand	211	...	211	...	119658	...	...	...	...	...	...	...
" America	...	...	...	63025	2000	445	...	...	...	2514	..	8622
" Stockholm	...	...	...	...	...	...	...	...	...	...	...	...
" Constantinople ...	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 26th Jan. 1891	5254	...	5254	293301	3150777	2746	21431	136565	4221	6339		16312
Do 1890	13080	438	13518	222941	1977297	2074	29943	80500	23598	1095		4936
Do 1889	2369	376	3645	350446	1288974	1985	12184	41040	...	10210		16965
Do 1888	6639	76	6715	485859	920271	1335	20821	441[illegible]9	48341	25358		23009

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, January, 15th 1891.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	Slightly softish to good Hard bright...	£5 10s a £7 10s
Yellow ...	Do. drossy & dark ditto...	95s a 110s
CINCHONA BARK--Crown per lb.	Renewed ...	4d a 10d
	Medium to fine Quill ...	6d a 9½d
	Spoke shavings ...	3d a 9d
	Branch ...	1d a 3d
Red	Renewed ...	2d a 10d
	Medium to good Quill...	4d a 9½d
	Spoke shavings ...	2d a 5d
	Branch ...	1d a 3d
	Twig ...	1d a 1½d
CARDAMOMS Malabar and Ceylon	Clipped, bold, bright, fine	1s 8d a 3s
	Middling, stalky and lean	10d a 1s 6d
Alleppee	Fair to fine plumpclipped	1s 4d a 3s
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, bri[ght]	1s 6d a 3s 3d
Long Ceylon	Middling to good...	1s a 2s 3d
CINNAMON 1sts	Ord. to fine pale quill ...	7½d a 1s 5d
2nds	,, ,, ,, ,, ...	7d a 1s 3d
3rds	,, ,, ,, ,, ...	5¾d a 1s 2d
4ths	Woody and hard ...	5½d a 10d
Chips ...	Fair to fine plant...	2d a 7½d
COCOA, Ceylon ...	Bold to fine bold	108s a 119s
...	Medium ...	95s a 101s
	Triage to ordinary	55s a 85s
COFFEE Ceylon Plantation	Bold to fine bold colory...	110s a 115s 6d
	Middling to fine mid. ...	104s a 107s 6d
	Low mid. and Low grown	99s a 104s 6d
	Smalls ...	96s a 103s
Native	Good ordinary ...	87s a 92s
Liberian ...	Small to bold ...	85s a 93s 6d
East Indian ...	Bold to fine bold...	105s a 115s
	Medium to fine ...	100s a 105s
	Small ...	95s a 102s
Native	Good to fine ordinary ...	87s a 92s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£14 15s a £27 5s
Stuffing ...	Coarse to fine ...	£7 a £25
COIR YARN, Ceylon ...	Ordinary to superior ...	£15 a £30
Cochin ...	Ordinary to fine ...	£15 a £40
Do ...	Roping fair to good ...	£12 a £16 5s
COLOMBO ROOT sifted ...	Middling wormy to fine...	18s a 27s 6d
CROTON SEEDS, sifted ...	Fair to fine fresh...	10s a 15s
GINGER, Cochin, Cut	Good to fine bold...	50s a 70s
,,	Small and medium ...	37s a 45s
Rough	Fair to fine bold ...	20s a 32s
,,	Small ...	18s a 27s
GUM ARABIC, Madras...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	10s a 12s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES, pale ...	Good to fine picked ...	10s a 11s
	Common to middling ...	9s 6d a 10s
	Fair Coast... ...	9s 9d
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	11-16d a ⅞d
LEMON GRASS ...	,, ,, ,, ,, ...	1⅛d a 1¼d
ORCHELLA WEED ...	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	4½d a 4⅝d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO Lump ...	Fair to fine bright bold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright ...	5s a 9s
RED WOOD ...	Fair and fine bold	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to good flavor	£30 a £58
Do. chips ...	Inferior to fine ...	£9 a £30
SENNA, Tinnevelly ...	Good to fine bold green...	4d a 8d
	Fair middling medium...	3d a 5d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	16s a 18s
Do. ...	Mixed middling [bright	15s a 16s
Do. ...	Bulbs ...	10s a 12s 6d
Cochin ...	Finger ...	16s a 17s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9 inch	15s a 22s
2nds	Foxy & reddish 5 a 8 ,,	12s a 16s
3rds	Lean & dry to middling under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Soccotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic ...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	42s a 43s
	Ordinary and middling...	35s a 38s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright ...	3¾d a 4d
	Common dull to fair ...	3½d a 3⅝d
Stems...	Common to good ...	½d a 15-16d
COCULUS INDICUS ...	Fair	12s a 13s
GALLS, Bussorah & Turkey ℔ cwt.	Fair to fine dark blue	52s 6d a 58s 6d
[cwt.	Good white and green...	40s a 47s 6d
GUM AMMONIACUM per	Blocky to fine clean ...	40s a 100s
ANIMI, washed, ℔ cwt.	Picked fine pale in sorts,	£13 a £14
	part yellow and mixed	£10 a £12
	Bean & Pea size ditto	£5 a £8 10s
	amber and red bold ...	£10 a £11
scraped...	Medium & bold sorts ...	£5 a £7
ARABIC E.I. & Aden ..	Sorts ...	32s a 70s
per cwt. Ghatti	Sorts to fine pale ...	22s a 57s 6d
Amrad cla	Good and fine pale ...	70s a £5 17s 6d
	Reddish to pale brown ...	25s a 55s
ASSAFŒTIDA, per cwt.	Clean fair to fine	26s a 50s
	Slightly stony and foul ...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 37s 6d
MYRRH, picked ,,	Fair to fine pale ...	£5 a £7 10s
Aden sorts	Middling to good ...	62s a 80s
OLIBANUM, drop per cwt.	Fair to fine white ...	30s a 51s
,,	Reddish to middling ...	22s 6d a 27s
pickings...	Middling to good pale ...	12s a 19s
siftings ...	Slightly foul to fine ...	10s a 13s
INDIARUBBER Mozambique per lb.	red hard ...	1s 9½d a 2s 2d
Ball & Sausage	white softish ...	1s 3d a 1s 8d
	unripe root ...	1s a 1s 3d
	liver ...	1s 4d a 1s 11½d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb.	Nearly water white ...	4½d a 5d
2nds ,, ...	Fair and good pale ...	3¾d a 4d
3rds ,, ...	Brown and brownish ...	3¼d a 3½d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 4d
	Common foul and mixed	9d a 1s 8d
Rangoon ...	Fair to good clean ...	1s 10d a 2s 4d
Madagascar	Good to fine pinky & white	2s 2d a 2s 6d
	Fair to good black ...	1s 8d a 2s 10d
SAFFLOWER ...	Good to fine pinky ...	50s a 60s
	Middling to fair ...	40s a 45s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	9s 8d a 10s
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	20s a 21s 6d
,, ...	Common & middling soft	12s a 19s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb.	Middling to fine ...	2d a 3d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ℔ cwt.	Good, pure, & dry white	157s 6d a 160s
Japan ...	,, ,, pink	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	35s
Block [per lb.	Pressed	Nominal 30s
GUTTA PERCHA, genuine	Good ...	22s 3d
Sumatra...	Fine clean Banj & Maca-[sar	3s 6d a 5s
Reboiled...	Barky to fair	2s a 3s 9d
White Borneo ...	Common to fine clean ...	4d a 2s
	Good to fine clean ...	2s a 3s
	Inferior and barky ...	1s 4d a 2s
NUTMEGS, large, per lb...	64's a 80's, garbled ...	2s 9d a 3s 1d
Medium ...	83's a 95's ...	2s 1d a 2s 9d
Small ...	100's a 160's ...	1s 5½d a 2s 6d
MACE, per lb. ...	Pale reddish to fine pale	2s 6d a 2s 11d
	Ordinary to fair	2s 2d a 2s 4d
	Chips and dark ...	1s 11d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 3d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	1s a 1s 1d
	Dark, rough & middling...	6d a 9d
SAGO, Pearl, large, ℔ cwt.	Fair to fine ...	13s a 14s
medium ...	,, ,, ...	11s 6d a 12s
small ...	,, ,, ,, ...	9s 6d a 11s
Flour [per lb.	Good pinky to white ...	9s a 9s 6d
TAPIOCA, Penang Flake	Fair to fine ...	1⅞d a 2½d
Singapore ...	,, ,, ...	1-11-16d a 2d
Flour ...	,, ,, ...	9s a 15s
Pearl ...	Bullet, per cwt. ...	18s
	Medium ,, ...	15s 3d a 17s
	Seed ,, ...	16s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for February :—

AGRICULTURE AND ENTERPRISE.

It cannot be questioned that there is a great lack of enterprise in the south of Ceylon,—of whatever class, and more especially among the natives. There are undoubtedly cases that can be brought forward to disprove this general statement, but these are few and exceptional. Of late we have seen a number of Ceylonese leaving the Island to try their fortunes in other lands, impelled by the success of a few pioneers to imitate their example, till quite a little colony of young men has been formed in the Straits Settlements; but there is little doubt that one of the chief incentives to this action is the charm of novelty in leaving this country and journeying over the seas to visit new lands and new peoples.

Taking agriculture in its widest sense, we find very few of the Burghers of Ceylon as cultivators of the soil. It does not take long to count those who are engaged in the cultivation of tea, coffee, cocoa, coconuts, and cinnamon. Many who have gone in for these industries have proved themselves successful planters, while some have held up their heads well above the crowd. There have also been stray cases of those who have tried sheep farming, cattle and horse breeding, and tanning among the Ceylonese with more or less success: but how few compared with the hundreds that crowd the legal and medical professions, merely because these professions show beaten tracts, and because these hundreds have not the enterprise to strike out a new path for themselves.

Some time ago a native young man came to us full of the idea of starting off to America, after having read a plausible advertisement in a newspaper, with the idea of cultivating land. Of course it did not take long to dispel from his mind the gorgeous prospects he had conjured up there, from our own knowledge of the import of such advertisements; and we strongly advised him if he had any special desire for anything like colonization under difficulties, he might begin on a moderate scale by applying to the Ceylon Government for a grant of land in some neglected region of the Island, on the promise of bringing it under cultivation of paddy, cotton, dhall, Indian corn, arrowroot or the like. But with this suggestion his enthusiasm died away. Why this should have been the case it is difficult to explain, except by supposing that it was the charm of novelty more than the determination to work for one's living that was the dominating influence in this special case, and thus accounting for the fact of a youth, who had never left the shores of his Island home, conceiving the idea of travelling thousands of miles to cultivate land under, what would be to him, insuperable difficulties, rather than of carrying on similar work under more favourable circumstances in his own country for his own and his kinsmen's benefit.

There are parts of this Island in a sadly depressed state, not so much because they are incapable of supporting a population, but because all that might be done to help nature to yield her stores of food has not been done. It is not to be thought that we look upon such cultivation as an easy matter, and it must be acknowledged that it is no light task to work up lands that have been allowed (no doubt owing to objections against soil, rainfall, climate and situation) to lie neglected. Yet there is an experiment to be attempted, and an honest effort to be made, that have not yet been done. There must be some who, having come under the influence of agricultural instruction in Ceylon, have a taste for

and a fair idea of opening out and cultivating land, but who want encouragement to give them enterprise. The religious zeal that fires the Salvationist to form schemes for colonization and cultivation is not theirs. Official encouragement and aid is what is necessary to start them. Certain terms should be laid down with grants of land—not of course as grand or visionary as those of the Amercian newspaper advertisements—and the plea (an honest though a common one) of a want of capital, might be met.

If in this way a few bands of young men of an adventurous turn of mind can be got to open up the neglected areas of Ceylon, there is no reason why, with steady perseverauce and a knowledge of their work, they should not succeed in bringing relief to the indigenous population by introducing new methods of cultivation and new food products to their notice, but also in benefiting themselves.

OCCASIONAL NOTES.

We referred some time ago to the case of Mr. Jayasinghe, a student who passed out in 1888, who was engaged in opening out a very large tract of land in the South with the object of sugar-cane cultivation. Of last year's batch of boys, three or four have already started cultivation on their own lands. Mr. Abeysuriya, who since he left in Decembsr last, has been planting arecanuts, dhall, sugar-cane and Indian corn, writes that he is at present occupied in clearing an area of two hundred and seventy acres. Mr. Jayawardeue has invested in some land in the Polgahawela district which he intends to lay under coconuts and cocoa. Mr. Manchanayake is working hard at paddy cultivation, according to improved methods, in his native district of Cotta, where he also intends to cultivate vegetables on a large scale. Messrs. Cooray are co-operating with a relative in working a tea estate in the Kalutara district. This is all most encouraging, and the news comes as a pleasant surprize to us since we penned the lines regarding the want of enterprize in the natives of Ceylon. We heartily wish all these old boys the full measure of success which their pluck and perserverance will deserve. With their start in life as independent agriculturists, and the late appointments as Agricultural Instructors, both Government and private, our stock of passed men waiting for 'something to turn up' is all but exhausted.

The notes which our Agricultural Instructors were wont to send us pretty regularly in the early days of the Magazine, seldom or never reach us now. This is unfortunate both for ourselves and them: for while such notes must be of interest in a circulating medium of agricultural knowledge and news, there are ways in which we may be able to help these correspondents through the Magazine or privately. By means of regular reports (which otherwise we seldom if ever see or hear) communicated to our monthly, we shall (having no alternative of personally visiting, encouring, and advising) be always kept informed of the state of affairs agricultural at each station, and be best able to deal with special matters, when it is thought necessary to refer to us.

The idea of publishing current crop and weather reports, brought forward by the Hon. J. J. Grinlinton in the Legislative Council the other day, is a very happy one, which, morcover, has been carried out to great advantage out of Ceylon. Early information regarding matters of such a nature as brooks uo delay when interference is demanded, is very necessary. Timely notice often arrests incalculable damage or loss.

Mr. Mendis has been appointed Agricultural teacher at Prince of Wales' College, Moratuwa, where he has a large number of students, who are also being instructed in practical work. We hear that the boys evince a great interest in their agricultural studies, and take very kindly to outdoor work. It is contemplated, we believe, to start dairy work before long at the College. Our best wishes are with the Principal, Mr. Goonewardene, and the Messrs. De Soysa, the patrons of the school, that their efforts on behalf of the inhabitants of Moratuwa may be fraught with success.

Two other appointments have been made lately, viz., that of Mr. Goonewardene to Kolonna Korale, Rakwana, as a privately paid Agricultural Instructor, and of Mr. Gunesckere as teacher of agriculture in the Buddhist School at Hatton. These private appointments, coming as they do after much adverse criticism and ridicule of the instruction imparted to the students at the School of Agriculture, must be a source of great encouragement to the teachers and promoter of that institution; while at the same time it is an indication that there are those amongst us who recognise the need of improvement and reform in native agriculture, and are taking active measures to bring about so desirable a result.

There is at last some prospect, however remote, of a geological survey of the island being made. The officers of the Survey Department have been instructed to collect geological specimens from all parts of the country, and forward them with their notes to the Colombo Museum, as a first step towards a geological survey. But who is to identify and arrange the specimens at the Museum? Evidently a special officer will have to be appointed, for to judge from the present collection of rocks and minerals at the Museum, there is no one qualified for the work among the officers of that institution. The specimens now there are miserably poor in number; some have evidently not yet been identified; and what is worst of all, a good few are wrongly labelled. Even mica, which every tyro knows, is named talc; while the labels 'lemonite,' 'orthoalase,' 'grannlite' go to show that someone requires a few lessons in spelling. However, let us hope that before long our students of geology will have a collection at the Museum that will help them and not mislead them in their studies.

It is a great matter that the School of Agriculture has been chosen for the office of the Central Committee of the Imperial Institute in Ceylon,

Specimens of natural products from all parts of the Island will find a temporary home in the school, the students of which, from contact with so representative a collection as is sure to be formed, and one, moreover, which will deal largely with agricultural products, should derive incalculable benefit. It is to be hoped that it will be found practicable to have the specimens on view after they are finally classified and arranged.

Paddy growers in lower Ambagamuwa are more fortunate than the majority of their brethren. A hundred bushels an acre are not an uncommon crop there, while a cultivator who is fortunate enough to have a rest-house for cattle overlooking his fields, is reported to take in four hundred bushels off an area of three acres. Transplanting is practised in this region, but the improved plough has not yet found its way among the agriculturists. Perhaps with the appointment of Mr. Gunesekere as agricultural teacher at the Buddhist school at Hatton, there is a prospect of the new plough being introduced to the neighbouring cultivators.

A beautiful specimen of the *Acherontia Satanas*, the Sinhalese representative of the English Death's-head moth *(A. atropos)* has been received for the School Museum. The beautiful moth belongs to the family *Sphingidæ* or hawk-moths of the Lepidoptera order. The distinguishing character of this insect is a skull-like mark on its back, and from this circumstance and the squeaking sound it emits when disturbed, it it said to be regarded with much superstitious dread by the country people of England and other parts of Europe.

The caterpillar of this moth measure sometimes nearly five inches in length and is of considerable thickness. It is beautifully marked, and on the last joint of the body there is a process curving over the joint like a tail.

The following is taken from the Rev. W. W. Gill's "Life in the Southern Isles" to show the very peculiar use to which a species of the hawk-moth is put to in the Islands of the South:—"A large handsome moth called the *iriano*, or sphinx moth *(Chærocampa erotus)* is common in the Harvey Islands. . . . The silky proboscis, exquisitely coiled up, sometimes attains the length of five inches. At dusk in the warm season these insects are very numerous, coming out of their hiding places and entering the dwellings of the natives, attracted by the light inside. In ancient times a certain method of secretly wreaking vengeance upon a foe was, on a dry night to catch two or three *irianos*, and after carefully unwinding their probosces, tie on narrow strips of stout native cloth lighted at one end. This cloth only smoulders, and like touchwood never goes out. The affrighted moths would then be set at liberty as near as possible to the dwelling of the intended victim. The *irianos* dragging through the air these strips of smouldering cloth would make for the highly-combustible thatch. In a few seconds the house would be in a blaze."

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Cucurbitaceae.

42. *Trichosanthes Cucumerina*, L. Sin. Dummella.

Is a wild plant growing in the uncultivated places of the warmer parts of the Island. It generally abounds in low jungles. *T. Cucumerina* is a prostrate creeper with a thin green wiry stem and alternate green, cordate leaves. The fruits are oval, having a smooth green surface with white streaks, and are about half the size of an egg.

The fruits borne on some plants have a pleasant taste, somewhat resembling that of cucumber, but in others it acquires a very bitter taste. It is ordinarily believed that if the fruit be eaten just as it is plucked, it has no unpleasant taste, but when kept for a while, even a few seconds, it acquires its bitterness; others more superstitious believe that so long as the name of the plant is not pronounced the fruit keeps well, but the instant the name is uttered it develops its unpleasantness! From observations made I find that some plants growing in jungles have naturally the bitter principle, whilst others growing in open grounds are devoid of it. In both cases it is increased by keeping the fruit after being plucked.

The importance of this plant is not much as a food product, but it is in great demand among the natives as a medicine. It has well-marked characteristics of a febrifuge, and is largely and successfully used in cases of fever.

43. *Cucumis Pubescens*, Wild Sin. Gonkekeri.

This plant is common in the low-country of Ceylon and grows wild in waste lands and on heaps of rubbish and roadsides. It is a creeper with thin tendrils. The stem is green and thin, and the whole plant is very hairy. The flowers are monoecious, and are borne in the leaf axils, the staminate flowers being very small with yellow corollas. Several pistillate flowers spring from the same axils, and hence it is not uncommon to find two to five of them in the same place, somewhat in the form of clusters. The full-grown fruits are about the size of the eggs of a house lizard, and are rounded in shape, green when not quite mature and attaining a scarlet colour when ripe. Before ripening, the small fruits possess a taste similar to cucumber, and are eaten by children; whilst in a ripe state they possess a bitter taste, but not altogether unpleasant.

44. *Cephalandra Indica*, Naud. Sin. Kowakka.

Is a plant common throughout the Island, and largely met with in higher elevations. It grows in waste places, and is a creeper with a thin green stem and cordate leaves much resembling the above-described variety. The leaf possesses a darker green colour and is not much covered with hairs. The fruit of this plant is considered to be poisonous, though much eaten by crows. The leaves are eaten especially in the upcountry in the form of dry curries, made with coconut and the usual curry stuffs.

45. *Zeheneria Umbellata,* Aru. Sin. Kavadukekeri.

This plant is generally found growing in wild places, but is rarely met with in cultivated grounds. It resembles much the *C. Pubescens* in its general characters, though the leaves of these plants look more succulent and a little larger in size. The fruits are larger resembling those of *T. Cucumerina,* but have not the bitter principle of that plant. They are eaten when obtainable.

The above-described varieties cannot strictly be reckoned as food products, as they are not much used as food.

Rubiaceae.

46. *Sarcocephalus Cordatus,* Miq. Sin. Bakmi.

Is a tree common in the warmer parts of the Island. It thrives generally in moist places, such as the banks of streams or ponds, and grows very high with many branches. The leaves are large, coarse, and rounded in shape with prominent nerves branching from the midrib to the margin almost at equal distances, but the general venation of the leaf is reticulated. The leaves and the epidermis of the soft parts of the stem are covered with coarse hairs. The infloresence of this plant is somewhat characteristic, the flowers being borne in a glomerulous capitulum, of the shape of a spherical ball. When the small flowers which have whitish yellow corollas open themselves, they give a most charming appearance to the tree. The compound fruits which are formed by these flowers also take a rounded shape. They are about the size of ordinary tomatoes. The fruits are covered with a dark brown epidermis with small black indentations, and consist of a yellowish fleshy mass which is hard and astringent when immature, and soft, and of a sweetish acid taste when ripe. The fruits are much eaten, and in some places they are sold in markets. A single tree bears a very large quantity of these fruits in a season.

The wood of this tree is of some value as timber, and the bark and young leaves are used medicinally in cuts, bruises, sores, boils and dislocations.

WATER-LIFTS. III.

By Aba.

The Double Mhote is an adaptation of the whim used in England for raising water and rubbish from mines, and in Australia for raising water for stock &c. It is said that the first machine of the kind was erected in India in the year 1869 from a model obtained from Australia. Since that time it has been much improved, and the following description of the action of the machine as it now exists on the Saidapet Farm is taken from the "Farm Manual," compiled by Mr. C. Benson, M.R.A.C., the former Superintendent of the Farm;—

"The water is raised by two leather buckets, similar to those in ordinary use in other parts of the Presidency; to each of these buckets is attached a rope which is fastened to a drum; one of these is coiled and the other uncoiled, as one bucket ascends and the other descends; the drum is fixed on a rotating spindle, to which is fixed at right angles the draught bar to which the bullock is attached; the diameter and thickness of the drum varies with the depth of the well; as a general rule, for all ordinary lifts the diameter of the drum may be equal to about one-fifth the number of feet that the water must be raissd; the drum is placed about 6 feet above the ground in order to allow the rope to pass over the head of the draught bullock; the spindle upon which the drum is placed is kept in its upright position by means of two beams, into which it is fixed, which cross each other at the middle, and are supported at the ends on posts placed opposite each other on the outer side of the bullock path. The bullock walks under the draught bar attached to a curved yoke, which turns on a swivel. In raising water the bullock travels round the upright spindle, thus turning the drum and winding one rope and unwinding the other. If the diameter of the drum is as suggested, $1\frac{1}{2}$ circuits around the path will raise each bucket to the requisite height; the bullock is turned round, facing the opposite direction, while each bucket is being discharged, no longer time is required to do this than is needed for the bucket to discharge its contents."

There is a model of the Double Mhote in the School Museum also sent from Madras by my friend, Mr. C. K. Menon, of the Saidapet Farm.

In my previous article on water-lifts I described the Single Mhote which is in use throughout India. To compare the two machines it will be seen that the "double" will raise about 30 per cent more of water than the "single" at a saving of about 50 per cent of the cost of lifting. But the Double Mhote has not yet come into general use, owing probably to the poverty of the ryot. The erection of the Single Mhote is within the power of every ryot almost, while the double requires the services of carpenters, and the outlay of a sum of money not within the reach of many a one.

NOTES FROM INDIA.

[Being translated extracts from letters by a Sinhalese Gentleman.]

The ryots of India are a more industrious lot than our Ceylon goiyas. At present there is a drought, such as we are having in Ceylon, prevailing in Southern India, but while the Indian ryots are irrigating their fields by means of wells, our goiyas are crying over their withering crops without adopting any remedy to save them. The practice of irrigation by wells is well worth a trial on the part of the Sinhalese cultivator. The Indian ryots irrigate even their coconuts, plantains, &c., when they suffer from want of moisture.

The paddy cultivators in India systematically adopt "transplanting" with paddy, and there is no doubt that this method produces superior results to that of ordinary broadcast sowing. As I travelled by rail I observed hundreds of acres of transplanted paddy. Why shouldn't the Ceylon goiya go in more for transplanting?

The peasant women of India are decidedly more devoted to agricultural work than our countrywomen.

Another thing that struck me from contrasting the natives of Ceylon with the natives of India is, how prone our people—both men and women—are to imitate foreign customs and foreign dress. This no doubt acts directly and indirectly as a great drawback to their agricultural pursuits.

In some of the waste lands I observed that the Indians plant *Casuarinas* (whip-trees), quick growing trees, the wood of which is sold as fuel to the Railway Companies. Here is a hint for the Ceylonese.

Madras, January 1891.

The Castor-oil plant is cultivated to a large extent in India. In some parts I saw gardens of twenty to thirty acres under this plant. It grows easily here, and the Indian ryots obtain good profits by its cultivation. A cwt. of castor-oil fetches from R13 to R18. The ryots prepare their land for castor-oil by ploughing; no manure is used, and the seed is sown broadcast.

Bombay, 7th January.

AGRICULTURAL SALT.

Prof. Thompson of Aspatria College appears as a vigorous advocate of salt for agricultural purposes. In an article on Agricultural Salt he enumerates a large number of references made to salt in connection with agriculture. In Luke chapter xiv, it is written, "Salt is good, but if the salt has lost its savour, wherewith shall it be seasoned? It is neither *fit for the land*, nor yet for the dung-hill; but men cast it out." Cato who died B. C. 150., says:—"When you lay up your straw, that which is most nutritious is to be laid under cover; sprinkle salt over it, then serve it for hay. If your sheep are scabby, take some lees of oil and water, in which lupines have been boiled and the dregs of good wine, mix them all together; when you have shorn your sheep anoint them all over, suffer them to sweat for two or three days, then wash them in the sea; if you are not near the sea make salt water and wash them with it. If you do this your sheep will not be scabby, they will have more fine wool, and the ticks will not molest them."

Virgil also bears undoubted testimony to the successful use of salt for cattle.

In 1638, Lord Bacon expressly mentions the benefits derived from watering various vegetables with a solution of salt and water. Sir Hugh Platt, in 1653, states "that it is salt which makes all seeds to flourish and grow, and that no dung which is laid on barren grounds would in any way enrich the same if it were not the salt in it."

In 1742 Professor Hoffman observes "that small pieces of fossil or rock salt were given to animals to keep away internal corruption and disease."

Dr. Brownrigg, in 1748, says:—"Salt is dispersed all over nature, it fertilises the soil, it arises in vegetables, and from them is conveyed into animals; so that it may well be esteemed the universal condiment of nature, friendly and beneficial to all creatures endowed with life, whether it be vegetable or animal. When properly used as a manure, it affords ample nourishment to corn and other vegetables, and renders kingdoms rich and fertile."

In 1817, Lord Kenyon, Sir Thomas Bernard, Bart., and Mr. Curwen (Workington Hall) bore testimony to its value as an admirable manure, and for cattle.

So that since the date of the New Testament the beneficial effect of salt on the land, the dunghill and for sheep and cattle have been noticed in some parts of the world at least. Its value in cattle treatment is still recognised very generally, and the Ceylon Cattle Commissioners have strongly recommended its use in cases of murrain. In the agriculture of the country, however, it is little used. From the great solubility of common salt, it must be expected owing to the very great rainfall in many parts of Ceylon, especially in districts where the soil is overporous, that the greater part of the sodium chloride in the soil must be washed off in a tolerably limited period—the land thus "losing its savour." This washed-out condition of soils, as Mr. Thompson points out, will greatly facilitate the development of minute organisms, which, if not checked, attach and destroy our cultivated crops. It is difficult to think of a plant that has not some insect which affects it, for a great variety of inferior insects are nourished and live by their ravages on the vegetable world. For the destruction of a large number of lowlife forms there is nothing, says Mr. Thompson, so effective or so cheap as a judicious and plentiful application of crude crushed rock-salt. It is pointed out that wet seasons have always been known to generate and develope parasitic diseases in animals; and it may be noticed that insects injurious to plant life are favoured by the dampness and humidity resulting from such weather. It is therefore recommended that there should be a timely dressing of the lea lands and stubble with salt, previous to ploughing or turning up the soil, and before the ova of the future insects have had time to hatch and bring forth the larvæ or grubs, in which stage they are most destructive, so that a great many evils to plan and animal life may be averted. All lea and stubble lands Mr. Thompson suggests, should be dressed with 10 or 15 cwt. of crushed rock salt to the acre, previous to ploughing. This advice is especially applicable to cultivated land in tropical countries where insect life is so abundant.

Miss Ormerod, in her report issued last June, recommends the use of guano and salt for wheat infested with the maggot of the wheat bulb fly (*Hylemyia Coarctata*), because, she says, "Wheat having the power of imbibing salt until the plant tastes strongly of it, this application would be likely to be very detrimental to the young maggots feeding on the stems."

All this testimony goes to prove the value of salt in agriculture, and that it is very desirable that salt for agricultural purposes be placed more within the reach of cultivators in Ceylon.

COCA LEAVES (ERYTHROXYLON COCA).

By W. A. De Silva.

Owing to the medicinal principle (cocaine) found in the leaves of this plant, it is being cultivated at the present day in many parts of the world. In Ceylon there are some species of Erythroxylxn, viz., the *E. Monogynum* and *E.*

Lucidum, which grow wild. Both these species are considered to possess certain medicinal properties, the former possessing properties very similar to that of coca, in as much that the leaves have the property of appeasing hunger.

The Erythroxylon Coca, or the plant from which cocaine is obtained, is a bush about four feet high with a small light geen leaf. The flower is white and the fruit a red berry. Herndon mentions, that in cultivating this plant, the seeds are sown in beds at the expiration of the rainy season. Arbors of palm trees are built over the young shoots to protect them from the sun, and they are watered, if it continues dry, for a week or so. The tree is transplanted a year and a half after planting, and gives its first crop in one year from that time, and a crop every four months after.

The bush if not destroyed by ants, will give crops for many years. Sometimes, but rarely, the leaves wither and the crop fails. The leaves should be dried when gathered, as quickly as possible. A hundred plants of coca are estimated to yield 20 lb. of leaves at a plucking.

The coca plant is likely to thrive in Ceylon, as the specimens growing in the Henaratgoda Tropical Gardens tend to prove.

About the properties of these leaves, Mr. H. F. Fish in a paper on the subject in the Technologist, mentions that when suppiled with an abundance of coca leaves, the Indian sometimes performs prodigies of labour and can go without food for several days; without it he is miserable and will not work. It is said to be a powerful stimulant to the nervous system, and like strong tea or coffee takes away sleep, but unlike tobacco and some other stimulants, no one has known it to be injured in health.

It is said that by taking a sufficient quantity of coca a man is capable of dispensing with food for 5 days without any material inconvenience, even though he be engaged in rapid travelling on foot the whole time. This leaf is highly valued by the inhabitants of Chili, Peru, and Bolivia, not only as a medicine, but also as an article of food, and serves with them as a substitute for the tea, coffee, betel, tobacco and opium used by other nations.

It has been established by experiments carried on by Dr. Mantegauza, as reported in the paper mentioned before, that the leaves of coca, chewed or taken in weak infusions, have a stimulating effect on the nerves of the stomach, and thereby greatly facilitate digestion. In a large dose coca increases the animal heat and augments the frequency of the pulse and consequently respiration. A medium dose, three or four drachms, excited the nervous system in such a manner that muscular exertion is borne with great ease, but afterwards produces a calming effect. Used in larger doses it causes delirium hallucination, and finally congestion of the brain.

GENERAL ITEMS.

The School of Agriculture opened on the 16th January. Out of a large number of applicants, some fourteen resident pupils have been chosen, besides four day scholars.

The harvesting of the paddy crop *(Sudu wi)* at the school was the first practical operation which claimed the attention of the students.

It is reported from Anuradhapura that the kurakkan crop has been much damaged by caterpillars.

A complete set of bones of a Ceylon bullock has been presented to the School Museum by Mr. Manchanayake, an old boy. This comes as a very opportune gift, which will be of great value to the Elementary Veterinary class—there being no *complete* skeleton of a bull or buffalo in any of the Museums in Colombo.

Mr. Menon, of the Agricultural College, Saidipet, has been writing to the *Ceylon Independent* recommending irrigation by wells for paddy cultivation in the dry parts of Ceylon. The letter has given rise to some discussion: some favouring, others throwing discredit on, the suggestion. Mr. Menon was for a time connected with the Colombo School of Agriculture, where he proved himself an able teacher, deeply learned in the science and art of agriculture.

Professor McConnel of Oxford, author of *The Agricultural Note-book*, has published a pamphlet on agricultural education. "My experience," says the Professor, "is that agricultural education of the proper sort enables a man to farm better and make more money than he would without it; if it does not do these things, then it is a mistake altogether, and the present movement had better stop where it is, and go no farther." In the Professor's view there are only four institutions in Great Britain which realise what he believes to be the best system of agricultural education. These four places are the Edinburgh University; the Normal School of Science, South Kennington; the Glasgow Technical College; and the University College of North Wales. The Professor has been brought to task for not including Aspatria College in Cumberland, which, while it has gained many distinctions of late at public examinations, is an institution which charges a very low scale of fees. It will be observed that Cirencester College, which was the 'fashionable resort' of agricultural students for a long time, is quite out of the reckoning.

Fourteen agricultural students, who successfully passed their examinations at the Nagpore School of Agriculture, have obtained posts as revenue inspectors.

Bamboo is considered, according to a Bangalore paper, the best material for making charcoal for blacksmith work, and is in large demand all over Mysore. It is said to give out more heat than the best coke and to require less blast. This bamboo charcoal fetches twice the price of the best charcoal of any other fuel. The method of charring bamboo is rather different from that used for harder woods—the stacks being carefully covered with green leaves and plastered with wet clay. While the burning is going on, care is taken to exclude air as much as possible without extinguishing the fire.

Says the *Indian Agriculturist*:—Lupins have been found very useful as binders and regenerators of sandy soils. *Lupinus luteus*, the scented yellow variety, is predominantly in use in

Middle Europe as a green manure to improve sandy soils; it is the best of all yet tested, and will do even for coast drifts. Lupin seeds are very fattening when used as an addition to ordinary fodder, and are in this respect quite equal to oil cake, while the hay is said to be not inferior to that of clover, and more bulky. Plants native to California, says the editor of the *I. A.*, ought to succeed fairly in Ceylon.

Dr. William Fream, B. Sc., has been appointed Steven lecturer in the University of Edinboro' for three years. Dr. Fream devotes his first year to the Science of Entomology in its bearings on agriculture.

Would we had such men in Ceylon as Mr. Lumsden, of Garmond, in Aberdeenshire, who has bequeathed £10,000 for the prevention of cruelty to animals.

Mr. Chaplin, the Minister of Agriculture in Great Britain, hopes to bring forward proposals which will entail some addition to the present grant for agricultural education.

A correspondent writing to the *N. B. Agriculturist* states that a section of an enormous tree is being taken out in the Mammoth Forest, California, the section being 9 feet high. The tree which grows 6,325 feet above sea level, measure 99 feet in circumference, and nearly 33 feet in diameter. The saw used in getting out the section is 22 feet long, and requires 8 men to handle it. Two months will be required to complete the work, and the weight of the section is expected to be not less than 20 tons.

A bulletin of the Maryland Experimental Station places great stress on the "testimony of plants" in the application of fertilizers. Pale green colour betrays a lack of nitrogen, or a red brown shade in the green of the leaves indicates that the slowness of their development, in spite of rain and sunshine, is a result of insufficient nourishment. A bright and deep green colour in almost all crops is evidence that nitrogen is not specially deficient, but no proof that more might not be used to advantage. Luxuriant growth and good crops of corn, cabbage, potatoes and grass shows a good natural supply of potash. If small grains produce well with the kernels, plump and heavy, phosphates cannot be especially needed. Simple experiments which any farmer can make for himself will show whether the soil is need of manures, and to what element of plant food it especially responds. On this branch of the subject—what plant food to buy and what quantity—Prof. Magner's conclusions are substantially as follows:—Phosphoric acid and potash should be used liberally, and with reference to the needs of the soil rather than the demands of the crops. These food constituents should be applied in excess of the needs of the plants. In this there is no danger of waste of potash and phosphoric acid, substances which the soil binds up and preserves for later crops in case the one immediately following demands them only partially or not at all. Consequently, as to these two, they may safely be applied till present in sufficient surplus; that is till a further application is without effect. The greatest profit results in holding the soil in this degree of food surplus as to phosphoric acid and potash. With nitrogen it is quite different; this is not found to be retained by the soil, and although temporarily held it is freely moveable. Any residue from the wants of a crop to which it has been applied, is in danger, especially during the winter months, of being washed into the sub-soil and lost. Hence nitrogen should be measured out as accurately as possible according to the needs of the plant for which it is particularly applied.

Copper in Cereals.—Writing to the *Lancet* on this subject, Mr. Wm. Johnstone, Ph. D., &c., says:—"This question has very lately been prominently brought under my observation, and that in a novel and unexpected manner, necessitating the examination of a large number of samples of wheat and barley, which resulted in 15 per cent. of the samples being found to contain copper in more or less quantity, particularly in the Scotch barley. The existence of copper in cereals, therefore, becomes a serious question, especially to manufacturers of infants' food, as they are liable at any moment to have proceedings instituted against them under the Sale of Food and Drugs Act. It was due to legal proceedings being threatened against a manufacturer of infants' food which caused the matter to be placed in my hands. The plantiff's analyst certified that the food contained lead, which had caused serious illness to an infant; but upon closer investigation by myself, it proved to be copper, and it was present there as a natural constituent of one of the cereals used in the preparation of that particular infants' food. Granting that cereals do possess the remarkable property of taking up copper from the soils in which they are grown, provided that soil contains copper, the question immediately arises, What is the maximum amount of copper which barley or wheat is capable of taking up? Few soils in this country contain copper to any appreciable extent. I am therefore inclined to attribute the presence of copper in Scotch barley and English wheat to the prevalent practice of dressing the grain and also the ground with sulphate of copper, so as to protect it from the ravages of vermin after the grain is sown. The possible existence of copper in cereals may also account for some of those mysterious and unaccountable cases of illness which occur from time to time in families, and is therefore well worth the attention of medical practitioners, and also that of the manufacturers of infants' food."

E. T. H. received with thanks: will appear in our next.

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THE CULTIVATION, MANUFACTURE AND CHEMISTRY OF TEA.

SOME very valuable information on these heads will be found in the report of Mr. Bramber which is given in the proceedings of the Horticultural Society of India on page 616. As a preliminary to his detailed and exhaustive analyses of the tea bush, soils, manures, &c., tho chemist employed by the Horticultural Society and the planters has commenced visiting tho various tea districts, and the report we are to extract contains a record of the impressions produced by the first of those visits. With reference to recent discussions on forking, it will be seen that Mr. Bramber attaches much importance to frequent and deep hoeing of the soil so that air and moisture may be admitted for the decomposition of micaceous and other rocks containing potash. Very close planting is objected to because of the obstacle to hoeing presented by the interlaced roots, such interlacing also rendering the bushes more liable to attacks of blight. All planters will agree that when plants are diseased, whether suffering from insect or fungus pests, the prunings ought, as Mr. Bramber suggests to be burned and the ashes (with all ashes from the factory and lines), carefully applied as manure. But we submit that the prunings from healthy plants can be better utilized if buried unburnt. Our experience is that neither decomposing prunings nor rotting tree-stumps do any harm to, but rather benefit, tea bushes, with one notable exception in the case of a very beautiful but very fatal *symplocos*. On the decaying tuberous roots of this special tree, a poisonous fungus forms, which, when it comes in contact with the roots of the tea bushes, is speedily and inevitably fatal, gaps arising from the destruction of three or four to a dozen tea bushes, being scattered over estates, where stumps of this upas-like tree have been left to decay in the ground, instead of being carefully removed and burnt, as they ought to be. What Mr. Bramber says about plants left to grow in old nurseries is in accordance with all experience, and what is said of the loss of nitrogen by the periodical firing of grass lands is worthy of attention. Whether for improved pasturage or cultivation with tea or other plants, our patanas would be enormously benefitted by the application of nitrogenous manures. The pity is that such substances are so costly, the disturbed condition of the American sources of supply tending to make them still more so. Droppings in caves haunted by bats and swiftlets would be valuable, but we believe the Sinhalese rice cultivators appreciate and use this matter largely. The question is whether grass lands might not be enormously improved by the growing and burial in them of several successive crops of leguminous plants, such as the lupins, common peas, &c. Clover might also be tried, as its roots go far down into and improve the soil, in which it will grow. Mr. Bramber's notice of the heat produced in tea leaves by the friction of the roller, and the subsequent rapid cooling down from evaporation in the "fermenting" process, are suggestive of important and beneficial results, likely to be attained from further research in this direction. We shall look with keen interest for further reports of the comprehensive experiments which Mr. Bramber is to institute.

SALE OF VALUABLE ESTATE PROPERTY.

The estate of Holyrood West in Dimbula, consisting of 546 acres of which 350 are planted with tea and 150 acres still in good coffee, has just been sold by Mr. G. S. Duff to the Ceylon Plantations Tea Company for £15,000 sterling. The Company is to be congratulated on acquiring so valuable a property which apart from its intrinsic value, has a railway station at each end of the estate—Watagoda and Talawakele. Mr. Talbot has now in charge for this Company a series of as valuable properties as have ever been owned by a plantation Association in Ceylon.

OPERATIONS FOR GEMMING IN CEYLON.

The capital which was conditionally underwritten should the preliminary work by the Syndicate prove satisfactory was, to the best of my remembrance, £250,000, or even £300,000. All hope of the underwriters carrying out such an engagement must now, it is certain, be abandoned. This class of speculators have, as you have before been informed by me, been so fearfully hard hit during the last six months, that there is scarcely a penny of available capital among all its members. Fully alive to this fact, Mr. Saunders tells me he and those working with him have quite given up all idea of ultimately proceeding on so grandiose a scale. At length, and for the first time, Mr. Saunders has informed me that Mr. Barrington Brown's report was a hopeful one. That report stated in effect that, while the conditions as regards gemming in Ceylon prevented him from giving full assurance as to ultimate success, he felt the conviction that its undertaking on a considerable scale had a hopeful future before it. He has, since the sending in of that report, furnished estimates for the machinery, &c. necessary for preliminary working on a moderate scale, but the Syndicate, in view of the total impossibility of obtaining any public subscription at present, has determined upon itself commencing work with the £6,000 of its capital as yet uncalled up. In pursuance of that intention, a practical miner is to leave England for Ceylon within the next few weeks, and he will take with him steam pumping machinery adequate for clearing water from mines of a depth of 100 to 150 feet, and will begin operations as soon as that machinery can be erected. This, as I understand, has already been purchased here and is to be shortly shipped for Ceylon. At the same time, one of the plumbago properties owned by the Syndicate is to be simultaneously worked, and should satisfactory results be obtained from both industries, subsidiary companies may be started with a capital of £50,000 each; or failing any prospect of starting these successfully, additional capital for extension of the work will be subscribed by the members of the Syndicate themselves

THE CEYLON (AMERICAN) PLANTERS' TEA COMPANY.

A specimen of one of the paper packages used by this Company for packing their teas has reached us. It is of a very pretty design and intended to hold one pound of tea. The printing is executed in several colours and looks very attractive. The trade mark of the Company (an elephant surrounded by branches of tea) is printed in white on a red ground in the centre on four sides of the box, together with the following inscriptions in suitable type and positions:—

"The Ceylon Planters' Tea Company trading under the auspices of the Planters' Association of Ceylon. The Ceylon Planters' Tea Company, New York City, trading under the auspices of the Planters' Association of Ceylon.

"Budh-Tea of Ceylon, formerly Buddha, altered at the request of the Buddhist Defence Committee of Ceylon.

"INFORMATION:—This Company has been formed by the British tea planters of Ceylon to open up and control the American trade in the teas of Ceylon. They are interested in having their teas sold pure, understood and properly used. They will not allow it to be mixed or tampered with in any way, and this package contains one full pound of Ceylon tea, guaranteed strictly pure and unadulterated. *Our brands* all come from the same bush and differ only in the age of the leaf. They are sorted by sifting and the smaller the leaf the finer the flavour. Buds finest of all.

"GRADES AND PRICES.—Bhud (tea-leaf buds) 1 dollar and 25 cents a pound; this brand has the finest flavour. Tiffin (small leaves) 90 cents a pound; this brand has fine flavour. Bungaloe (large leaves) 65 cents a pound; this brand has good flavour.

"Till you have a local supply we pay freight or expressage. The three are alike, except in age of leaf. All come from the same bush, and the leaves are plucked together. The smaller the leaves the finer the flavour: and yet some prefer Tiffin to Bhud.

"HOW TO MAKE PERFECT TEA.—Use an earthen pot and have it hot to begin with. Use fresh water that has just come to full boiling and has not been boiling so long as a minute. Make tea at table, not in the kitchen. Pour the boiling water into the pot, put the tea in on top of the water, and in from two to seven minutes pour into cups or another tea pot. Do not let the tea stand on the leaves much longer than seven minutes. Use half or a third as much of this tea as of China or Japan tea. How to make it better than usual but not perfect:—Steep it after the old American fashion and use half or a third as much as of China or Japan tea."

Ceylon tea in these packages will no doubt find favour with the American public soon.

SALE OF ESTATES.

Harmony estate in the Pussellawa district, hitherto belonging to Mr. J. Russell Grant, has been purchased by the proprietors of Nayapane for R45,000. It consists of 204 acres of which 115 are in tea.

Rogart and Lang's Land estates in the Kalutara district—proprietors Messrs. F. D. Mitchell and Donald Mackay—have been sold to Mr. Booth, the proprietor of Glendon estate in the same district, for £3,500 sterling. They comprise 779 acres, of which 238 are in tea with some Liberian coffee and cardamoms.

CACAO STEALING ON MAKULUSSE ESTATE, BEREDEWELA.

One Ramasamy kangani of Makulusse estate in Beredewela charged a man by the name of Ukkua Kattadia with theft and having the unripe fruit of a cacao tree in his possession, without being able satisfactorily to account for the same the property of Makulusse estate, whose manager is Mr. Tennant of Beredowela. It appears that the complainant noticing a pod that had been very recently pulled off near a tree below the store, took another two coolies along with him and went running along the path which led to the boundary of the estate on the Beredewela village side. He then saw a man with a bag on his shoulder going towards the village. One ran up and caught his head; he then dropped the bag, which contained thirty-five pods worth about R5. When the accused was asked where he got the pods found in the bag he said that while he seized the thief who was carrying it dropped it and ran away.

JUDGMENT.—This is a very clear case, and the defence is as audacious as it is novel. The accused is a very old man about 55 or 56, and I therefore will not sentence him to receive lashes, but he richly deserves them. I cannot help thinking that the accused was not the only thief who had been robbing the Makulusse estate. However, his attempt to go scot-free by throwing the theft on others has entirely failed. I find him guilty and sentence him to undergo rigorous imprisonment for a term of six months. (Signed) J. H. EATON, P. M.

THEFT OF CACAO FROM SUDUGANGA ESTATE.

The superintendent of Suduganga estate, Mr. L. Falkner, charged one Kalimuttu with stealing 22 pods of cacao valued R2·62½, the property of Mr. Hutton. It transpired in evidence that the watcher hearing a rustle amongst the cacao, went with another man to the spot and saw some six or seven men pick-

ing cacao. Seeing them the thieves ran towards a jungle, while one with his handkerchief bundled with cacao pods was seized about a chain's distance from the jungle. He was immediately brought to the head kangani and from thence to the superintendent. On being questioned he said that he stole the cacao upon the instigation of some other men.

JUDGEMENT.—The son of the accused only confess the case of the prosecution: "a party of about six men came to his father last night and took him away saying that the kangani of Suduganga estate wanted him. His father (the accused) did not return home last night, but this morning that lad hears his father had been taken to the estate." That story (if true) tallies with the case for the prosecution. The accused was seen at midnight running away with a party of six or seven men in the direction of a jungle into which five of them escaped and the accused was caught within a chain's distance from the jungle carrying a parcel of about nineteen cacao pods, sixteen of which were unripe. He is taken promptly to Mr. Falkner, the superintendent, and he there makes a clean breast of his guilt. He says he was inveigled into this theft by six others and that he alone was captured. That fact does not exculpate his guilt; it only aggravates it, for it shows that he is willing to unite himself with gang-robbers and help them in their depredations. I cannot under the existing state of law find him guilty under the 2nd section of the Ordinance No. 22 of 1886.—If I thought I could, I should feel certainly called upon in this case to do all I could to suppress the theft of prædial products by inflicting the only punishment which I think is likely to have a deterrent effect upon the village thieves, who live and thrive by thefts on European estates in the neighbourhood, viz., by imposing lashes on the offenders. The possession of the unripe fruit of the coffee or cacao tree, &c. by any person who is unable to give a satisfactory account of his possession thereof is constituted an offence by sec. 2 of Ordinance No. 22 of 1886, and shall on conviction be liable to the punishments provided for the theft of prædial products under section 368 of the Penal Code, and if the case fall within the power of the Police Magistrate to try, he the Magistrate may add lashes not exceeding 20 to the punishment he is authorized by section 368 to inflict. I may be mistaken in my construction of the section of the Ordinance No. 22 of 1886 I have quoted, but I feel strongly that the power of a Magistrate to inflict lashes is limited to a case where a man is found in the direction of a jungle into which five of them escaped; and the accused was caught within a chain's distance from that jungle carrying a parcel of 19 cacao pods all tied up in a handkerchief. He is taken promptly to Mr. Falkner, the superintendent, and he there makes a clean breast of his guilt. He says he was inveigled into this theft by 6 or 7 others and that he alone had the misfortune to be caught. This fact, instead of extenuating his guilt only aggravates it, for it shows that without any hesitancy or fear of consequences he could readily unite with gang-robbers and help them in their depredations. The value of the cacao found on his person may be very small, but the unchecked prevalence of a crime for which I think only lashes will be a deterrent, demands that I should inflict as severe a penalty as is competent for me to impose. I find the accused guilty and sentence him to undergo rigorous imprisonment for a term of six months.

(Signed) J. H. EATON, P. M.

THEFT OF DRIED CACAO SEED FROM CRYSTAL HILL ESTATE.

Mr. A. G. K. Borron charged one Barakare Gedare Suddara with the theft and removing of about four measures of dried cacao seed worth R1·50. From the evidence it appears that in consequence of the theft of cacao on the estate Mr. Borron put a villager on the watch. This watcher saw the accused going towards the caddies with a bag of cacao for sale. The accused was brought to the store to Mr. Borron, and on being asked from where he got the cacao said that a cooly gave it him. He was asked to point out the man, but pointed one who denied ever having given cacao to the accused.

JUDGMENT.—I find the accused guilty and sentence him to undergo rigorous imprisonment for a period of four months.—(Signed) J. H. EATON, P. M.

THE NEW GUINEA CO. AS PLANTERS.

From the Far East news comes that the S. S. "Ysabel," owned by the New Guinea Company, has arrived at Finchhaven, landing there the Plenipotentiary of the Kaiser Wilhelm Plantagen Gesellschaft (Hamburg), Mr. Kindt. The company intends to cultivate cocoa and coffee, and Mr. Kindt therefore had bought at Ceylon the necessary material, of which about 18,000 young cocoa plants have arrived at Finchhaven in good condition. The cultivation of coffee will be commenced later on. Herr Kindt is accompanied by four Malayan artisans, viz., two carpenters and two smiths, as well as by eighteen Malayan coolies.—*L. and C. Express*, Jan. 2nd.

RAINFALL IN LAXAPANA, MASKELIYA.

Mr. Geo. Greig is good enough to send us a carefully compiled, coloured diagram of rainfall which we shall notice fully hereafter, meantime giving his explanation:—"I enclose a very carefully kept record of the rainfall on this estate during the past 15 years. No doubt it will interest you as you so frequently refer to the heavy falls of rain that take place on Theberton, which in air line cannot be more than 3 miles from this, while we here are much more under the shadow of the great Peak than Theberton is. The falling-off in the last four years to an average of 121·21 against 157·35 on the previous 11 years is rather remarkable—the short-fall having taken place in the south-west months chiefly. At the same time there has been no falling off in the south-west monsoon—rather the reverse in 1890, along its main track between this and Yatiyantota.

MANA GRASS EXPERIMENTS; COLOMBO COMMERCIAL CO., LD.; COFFEE IN UVA; PATENT TEA-ROLLING MACHINE; ASSETS REALIZATION CO.

London, Jan. 9th.

My last letter described to you an interview had by me with one of the partners in the firm of Messrs. Curtis & Harvey on the subject of its proposed utilization of mana grass from Ceylon. It seemed to me to be singular that that firm should have ever conceived the idea of using a charcoal burned from this grass in the manufacture of gunpowder. As the result to my further inquiry made this week, we now know that Messrs. Curtis & Harvey had long experienced a difficulty in obtaining a supply of suitable material. The willow trees which long furnished the best-adapted form of supply, and which in past times fringed the banks of our English streams in such wild luxuriance, have gradually become thinned off that their number has become so wholly inadequate to the modern demand for the main base of gunpowder manufacture. The firm, therefore, had given general instructions to the patent agents to be on the look-out for anything novel coming under their notice which they might think offer a chance of being suitable. Messrs. Jensen, the patent agents of Chancery Lane, heard of the experiments proceeding with the mana grass on behalf of the Stanley-Wrighton Syndicate, and took a specimen of it to Messrs. Curtis & Harvey, who thought that they saw in it a possible alternative material, and consequently gave the order for a ton to be sent to them from Ceylon for the purpose of experimenting with it.

Calling at the offices of the Colombo Commercial Company this week to see if the report now about due could be obtained, it was told me that it would not be ready before the end of the present month, but that it might be expected to be of a not unsatisfactory character. The Uva and Spring Valley Companies, as you know, share the offices of the abovementioned Company, and Mr. Roberts told me that the directors of these had determined upon paying an interim dividend of three per cent in both cases, payment of this being due on the 12th of this month.

Conversing with the last-mentioned gentleman, the subject was introduced of the success reported in our last received *Overland Observer* of some of the land in Ceylon lately planted out with coffee plants from Mysore. Mr. Roberts, in reply to my questioning, said that although their coffee in Uva was doing pretty well, the results were nothing magnificent, the trees still suffering much from their insect pests. He further said he did not think it unlikely that new blood introduced, and planted well away from old infected coffee, might do well. "At all events," he remarked, " it is quite certain that no idea is at the present time entertained of rooting up coffee on our Uva estates for the purpose of planting tea. "I can't tell you, he continued," whether our directors may think it worth their while to replace exhausted trees with others obtained from India, for I have never heard the subject discussed. Mr. Brown is out in Ceylon now, and he will doubtless be able to judge whether the experiments reported by the *Observer* have had such a measure of success as to induce him to make such an alteration on our estates as you have suggested. It occurs to me personally, that, although the course mentioned might be successful on a new clearing away from proximate bad influences, it might not prove to be so in the case of isolated plants put down among coffee trees which have been infected and infested for years past.

The mention of Mr. Brown's name reminds me that it has been told to me this week that one of his patent tea-rolling machines is to be put up and worked for exhibition in some public part of the city very shortly, and this form of advertisement being now very popular and very successful, it may be expected that orders for these useful machines will be greatly stimulated. But we hear that such stimulation is not as yet much needed, for Messrs. Abernethy of Aberdeen, the manufacturers of the machines, have orders booked very much in advance of their power of immediate production. A modification introduced by Mr. Brown since his earlier machines were made is said to have given particularly valuable results. In the first instance the lid of the rolling casing was fixed. This is now made to revolve, and—as far as I can understand—at a speed differentiating with that of the rollers. This, combined with the use of brass liners instead of wood and a slightly increased spacing, is said to have completely stopped any tendency to throw the leaf out, while at the same time it keeps the tea under treatment far cooler than under the first arrangement adopted. —London *Cor.*

CINCHONA IN THE DUTCH MARKET.

Amsterdam, Jan. 7th.

CINCHONA BARK.—At the sales to be held in Amsterdam on January 22nd, 2,332 bales and 238 cases (about 215 tons) will be offered, divided as follows :—Java bark, from Government plantations, 252 bales, 39 cases, about 23 tons ; from private plantations, 2,00 bales 199 cases, about 192 tons, of which are : *Druggist's Bark :* Succirubra quills 172 cases, broken quills and chips 113 bales, 18 cases ; root 60 bales ; C. Schuhkrafft quills, 6 cases Lancifolia quills, 4 cases ; broken quills and chips, 5 cases. *Manufacturing Bark :* Ledgeriana, broken quills and chips, 1,430 bales, 22 cases ; root, 360 bales : Hybrids, quills, 11 cases ; broken quills and chips, 281 cases ; root, 88 bales. Total, 2,332 bales, 238 cases.

The January sales are comparatively small ones, because several parcels destined for that auction could not be warehoused timely enough, owing to our canals being closed by ice. Most probably the next sales—on February 25th—will be so much the larger—say at least 4,000 packages.—*Chemist and Druggist*, Jan. 10th.

WIND POWER.

DEEP WELL PUMPS.—It is remarkable to find water close to the surface in the alluvial soil in Vere in sufficient quantities to give a continual flow from pumps worked by windmills. It appears to me that, though there is not sufficient water at a depth of 30 feet for the purpose of irrigation, an increasing quantity would probably be found at lower depths and even enough to supply the large quantity necessary for irrigation. A series of tube wells driven at intervals with deep-well pumps attached might bring up a flow large enough for irrigation. The immense value of irrigation is evident to anyone who sees the parched look of the canes this year after the continuous drought, and knows what the land will produce with good seasons. At any rate the experiment of a deep well pump would be worth making.

[The above from the *Jamaica Botanical Bulletin* shews that wind power is commonly employed in the western island to raise water. Why is it not more utilized here ? A wind-mill has been a success at Galle.—ED. *T. A.*]

ANALYSIS OF TEA SOILS, MANURES, &c.

The following letter was received from Mr. Bambor after his first visit to the Tea Districts :—

"Having returned from a visit of inspection of some of the tea gardens in the Dooars, I now give you an outline of my observations and inquiries.

"The chief gardens visited were Sissobare, Matilli. Chulsa and Hope with others in the neighbourhood, and I have to thank the managers of the various gardens for their kindness and hospitality, and also for their willingness to afford me any information and assistance I required.

"The soil of the district varies a good deal, that of the higher land being of a redder colour and slightly heavier than that of the lower with land, which is generally of a light open texture, varying considerably in depth, and with a subsoil full of boulders and pebbles. Both soils have, however, been formed by the decomposition of the older rocks, and contain a large amount of micaceous sand, the decomposition of which, if it was not so slow, would yield a sufficient quantity of potash for the use of the tea plant. This however could be hastened by deeper and more frequent hoeing, which would enable the air to act more freely upon it, rendering it soluble and therefore in a condition in which the plan could make use of it.

"Although the soil of the lower lands is so open drainage is found to be absolutely necessary for the healthy growth of the plant, owing to the flatness of the country. If this is not done, the heavy rainfall causes the soil to become waterlogged, which stops root growth, and the plant naturally sickens and yields a smaller quantity of leaf.

"In the older gardens, the plants (a mixture of China and hybrid) have been found to be planted too closely, being in some instances only 2′ to 3′ apart, and this has caused a slower growth, owing to the small amount of feeding and breathing room allowed for each plant; it also appears to make them more subject to blight, as these bushes suffer more than those planted at wider intervals. Another disadvantage of this close planting is that the surface roots interlace with each other, so that deep cultivation is impossible without injury to the plants and therefore the air does not penetrate so deeply into the soil.

"I have suggested the burning of all prunings, especially all blighted leaves and large wood, as it is probable that hoeing in the former, unburnt, is one of the chief causes of the continuance of the disease, and if every manager would see that this is thoroughly done every pruning season, the serious ravages of this disease should be considerably lessened. The larger branches, also, if allowed to slowly decompose in the soil, form a suitable home for many insects and fungi, which may injure the growing plants. That decomposing would has an injurious effect on the plant is plainly seen where bushes are placed near a dead stump.* As a rule, they flourish for a time until their roots reach those of the decaying stump, when the leaves suddenly wither up and the plant dies. It is also very important that the ash obtained from the prunings should be restored to the plants, otherwise considerable loss to the soil would ensue. Besides it is the best possible manure for the plants, as it contains all the necessary mineral constituents in an easily available condition.

"Another important source of manure is the ash of the wood burnt in the engines; the ash from which is rarely made use of, being usually merely thrown out in heaps and exposed to all weathers, causing a loss of valuable plant food; whereas if it was placed under cover to protect it from the rain until a sufficient quantity for application was collected, a cheap and effective manure would be always available. Its good effect on the tea plant was well marked in one instance where it had been thrown among some bushes growing close to the engine house, these being of a healthy dark green colour, and nearly a foot higher than the surrounding bushes.

"The soil of the new extensions, which had previously been covered with jungle, is more suitable for the tea plant than broken-up grass land, no doubt due to the larger amount of organic and easily soluble mineral matter present in the surface soil in the former, and also to the burning or removal of the grass which causes an annual loss of organic matter and nitrogen, so that probably the application of a nitrogenous manure to this soil would be of great benefit.

"The site of the old nurseries is plainly marked in the old and new gardens, by smaller plants of feeble growth; this is no doubt owing to the large amount of surface soil removed with young plants, and consequently most of the readily available plant food, so that to these places either soil from the jungles near by, or some complete manure, should be applied to restore them to their former condition.

"There was only one point called for attention in the manufactory, which was, that in some cases the leaf was sifted after the first rolling, so as to separate the coarser from the finer leaves, by which means a more even fermentation is secured and a better sample of tea obtained.

"In noting the temperature of leaf during the fermentation I found that there was a gradual lowering for about two-thirds of the time, after which it remained constant at a temperature below that of the surrounding atmosphere. The high temperature of the leaf at first was due to friction in the rolling, and the rapid cooling to evaporation of moisture from the damp cloths covering the leaf. The following were the temperatures noted for fine and coarse leaves, taken at intervals of half-an-hour:—

Fine leaf	..77·9°,	74·3°,	73·7°,	72·6° F.
Coarse leaf	..74·6°,	72·4°,	71·6°,	70·2° F.

"However no definite conclusions can yet be arrived at as to the best temperature for the fermentation, as probably in the rainy and hot season, a different one would give as good or better results, and further trials will be made at that time when an opportunity occurs for again visiting the districts.—I remain, yours faithfully, (Sd) M. K. BAMBER.

It is proposed that Mr. Bamber should have an opportunity of seeing the districts of Assam and Cachar &c., before settling down to the analyses of soil. During his tour through these districts he will collect samples of soils and plants to be analysed, and organize all arrangements for manural experiments.—*Agricultural and Horticultural Society of India.*

* See *Proceedings*, March and May, 1887.

GROCERIES AND THE AMERICAN TARIFF.

One day last week a reporter of the *Public Ledger* of Philadelphia, dropped into the store of Finley Acker & Co., and was fortunate in meeting the unusually shrewd and level-headed senior member of the firm, who spoke as follows regarding the effect of the tariff on the prices of groceries:—

"Ever since the passage of the bill in nearly all branches of trade the cry has been heard: 'Higher prices! Higher prices!' So general and familiar has become the cry that when a young lady was facetiously asked to pay five cents for a two-cent stamp which she had ordered she gravely paid the amount without a murmur, attributing the advance to the operations of the McKinley bill.* * *

OTHER CAUSES OPERATING.

"Have any other causes operated to advance the prices of goods in your line?" asked the reporter.

"Yes, there is tea. On account of the rapid advance in the price of silver several months ago, teas advanced considerably in price, but are now back again to their former value. Although our trade has been rapidly growing, we think that tea should be used much more freely than it is. When we consider that a pound of tea will make nearly 300 cups, while a pound of coffee makes but 32 cups, we can readily see how economical tea is in comparison with coffee, even if the highest priced tea be used.

"The cost of coffees have still further advanced, but not to an extent sufficient to affect retail prices. We are hoping that in time we will again be able to sell coffee at the very low and popular prices of several years ago.

"While speaking of beverages we must refer to the development of the cocoa trade within the last year or two," continued Mr. Acker. "It has been almost phenomenal. Instead of cocoa being used on rare occasions, or in the sick rooms, it is now in daily consumption in many families. One reason for this is that more enterprise has been shown by cocoa manufacturers in popularizing this nutritious beverage, and demonstrating its cheapness as compared with coffee. One pound of cocoa is said to make from 60 to 80 cups, and when you can buy it at 40c a pound you can readily see how cheap it is. Even if you buy it at $1 a pound it will still be as cheap as coffee.—*American Grocer.*

"A CEYLON TEA-SELLING COMPANY, LIMITED.

UNDER THE PATRONAGE OF THE CEYLON PLANTERS' ASSOCIATION."

Such is the important decision arrived at by the representatives of the Ceylon Tea planters assembled in the Tea Fund Committee—namely, to take steps for the formation of a Limited Company to undertake the business of selling pure Ceylon teas, in new lands especially. The immediate cause of this movement has been the enquiry through the Imperial Bank of Russia on behalf of constituents as to the financial standing of the Planters' Association of Ceylon—made, evidently under the impression that the Association was a business Company of planters ready to sell their tea direct. There can be no doubt that there is room for such a Company as that now proposed, and that if managed judiciously on business principles, it ought to be specially successful in giving

handsome dividends to its shareholders. A further reason for such a Company is the need of affording even in the old country, a thorough guarantee to consumers and country dealers of the purity of the tea they drink, and of endeavouring to fight the battle of Ceylon tea against advertisers—large firms and even many who are pretended friends of Ceylon—who are really great enemies of our teas. The mischief for instance done by one of the largest dealers in tea in the United Kingdom who has a direct connection with Ceylon—and yet who goes on selling teas at 1s to 1s 3d per lb. giving the impression to many from the way Ceylon is referred to in his advertisements that these are pure Ceylon teas, must be very great. Another enemy of our teas has been brought to light through a circular issued by Messrs. Stuart Cranston & Co. of Glasgow who have the audacity to pretend to expose fraudulent dealers and in doing so, to make the following most false and libellous statements as regards Ceylon teas :—

"The ladies of Glasgow appear to act differently, for they continue to flock in crowds to these several unscrupulous dealers who have perverted and vitiated the public taste, and amassed fortunes in the act, by supplying strong, dark, bitter Indian and Ceylon teas, which are full of tannin, to the exclusion of the mild, pale, liquoring and finely flavored China Tea, from which the bulk of the tannin has been eliminated in the process of 'rolling'?

"Something akin to this is perpetrated by the Indian and Ceylon planters, because they retain all the tannin, while the Chinese (who are still the masters in the art of tea-making) discard tannin as a waste product. This is the one radical difference in the two systems, and explains why the Indian and Ceylon yield 9 per cent of tannin, while China tea yields only 3 per cent. The most remarkable fact is that all three yield the same amount of Theine.

We have Professor Dittmar's permission to quote his words, that 'on the question of quality and flavour a chemist can say nothing, and only a practical tea-taster can speak with authority.' Thus armed, we do assert that no Indian or Ceylon tea possesses quality and flavour equal to China tea compared price for price, at 1/5 per lb. and upwards.

"Note.—This statement may be qualified so as to except a few of the choice mild, fine flavoured Darjeelings and Ceylons such as we buy."

The Ceylon Planters' Tea Co. Ld., must make its business to controvert such incorrect and mischievous business notices and those of other large dealers who profess to sell good first-class teas at little over a shilling, by making known the true state of the case.

TEA ESTATE PROPERTY IN CEYLON.

There have been some big sales of property since our last, notably that of Holyrood West estate belonging to Mr. G. S. Duff with 500 acres of fine tea and coffee for £15,000 or at the rate of £30 sterling per acre. In addition, it is reported, Mr. Duff gets some £1,200 profit from the half-year's working, so that the price is a good one; but the property is very valuable to the Ceylon Tea Plantations Company who own Holyrood East with nearly 500 more acres of tea—so that there will be a 1,000 acres in a stretch in one of the finest parts of Dimbu'a with a railway station at each end.

By way of contrast however, we have a sale in the Kalutara district—also effected in England—which if not explained is certain to reflect on the value of property, in that district. News has come out from home that the "estates" of "Rogart" and "Lang's Land" for £3,500 sterling. Now, these two places are entered as belonging to Messrs. F. D. Mitchell and D. Mackay—the Ceylon Tea Plantations Co. being agents—and stand in our last Directory as follows :—

Rogart—185 acres tea; 15 Liberian coffee; 20 cardamoms; 176 acres reserve.

Lang's Land 50 tea; 333 reserve.

Most of the tea must be in bearing, and therefore that over 200 acres of our new product besides over 500 acres reserve (most of it big forest) should have sold for £3,500 is what no person at this end seems able to explain. It seems pretty certain that if locally advertised freely and sold separately or cut even into 3 or 4 lots, these properties should have sold for much more.—Meantime the fortunate new proprietor is Mr. Booth of Glendon estate adjoining; and the purchase seems, as we have said, to have been effected in London.

EXPORTS AND FREIGHT FROM CEYLON.

The following table for which we are indebted to a mercantile friend is of considerable interest. It has been compiled with a view to show that although the number of vessels which take cargo from Ceylon steadily increase, yet the quantity of cargo available increases in proportion—if indeed the increase in the latter is not more marked. In any case, it is quite evident tea cargo alone from Colombo is going on increasing at such a rate, that we shall be very glad for freight reasons alone, to see the Russian Volunteer fleet coming to this port to load tea direct from Odessa. The table is as follows :—

Abstract of Exports of Ceylon Produce in 1888, 1889 and 1890 reduced to Shipping Tons Ceylon scale.

Produce.	1888.	1889.	1890.	1890. Inc,	1890. Dec.	Scale per ton.
Coffee ...	9,976	6,291	6,107		184	14cwt. in casks, 16 cwt. in bags,
Cinchona ...	7,255	5,304	4,987		317	1750 the average pressed into 50 c. f.
Tea ...	24,331	34,048	46,901	12,853		1,000 lb. averages 50 c. f.
Cocoa ...	939	1,361	1,141			14 cwt.
Cardamons	287	361	387	26		1,000 lb. averages 50 c. f.
Cinnamon.	1,996	2,377	2,129		248	1,200 lb. in bales and 800 lb. in bags.
Coconut Oil	22,935	22,286	22,668	382		169 average.
Copra ...	11,548	3,198	10,791	7,593		12 cwt.
Poonac ...	5,159	6,811	7,254	443		20 cwt.
Coconuts ...	5,197	5,004	11,907	6,903		per mille.
Plumbago,..	11,276	23,775	19,287		4,468	20 cwt.
Coir Goods.	16,536	18,481	19,671	1,190		Rope 8 cwt. yarn, and fibre 6 cwt.
Ebony ...	608	178	468	290		20 cwt.
Horns ...	152	123	143	20		16 cwt.
Sapan wood	137	54	62	8		20 cwt.
Orchilla weed ...	40	45	25		20	12 cwt.
Kitool Fibre ...	298	491	399		92	6 cwt.
Citronella Oil ...	1,689	1,642	1,819	177		8,000 oz. averages 50 c. f
C'mon Oil	22	19	13	6	6	8,000 oz. " 50 c. f.
Total...	120,431	131,849	15,6159	29,885	5,575	tons Ceylon scale,
Net inc'ase 1890...		24,310			24,310	
		156,159	15,6159		29,885	

Vessels cleared outwards from Ceylon with cargo (1888) 573; (1889) 611; (1890) 698.

1888, 573 vessels' and 120,431 tons cargo=210 tons per vessel.
1889, 611 " " 131,849 " " =215 " "
1890, 698 " " 156,159 " " =223 " "
net increase = 8 " " in 1890

CEYLON UPCOUNTRY PLANTING REPORT.

CACAO: LOSS IN WEIGHT; THE "SUBMERGED TENTH" AND "NATURAL DRIAGE"—WEATHER—COOLIES.

Jan. 26th.

The cacao crop is drawing to a close; and while some have reason to regret that it has not been quite so good as they expected, others have done better and rejoice accordingly. There is no denying that many who went in at the first rush for this product were sadly disappointed. Here and there, all over the planting districts, there still remain evidences of that outburst of enthusiasm in the shape of isolated cacao trees—deplorably ragged looking things which would be enough to scare anyone from renewed efforts. They stand there as warnings and awful examples, and are pointed to as conclusive when a good word is said for a first trial. But about cacao we have learned much and are still learning, and I am of opinion that if, when there was a general run into cacao, the knowledge of its ways and wants had been at all abreast of what we possess today, there would not have been that shrinkage of cultivated area which we deplore, nor the current belief, which is pretty strong amongst us that only in highly favoured spots can this profitable cultivation be carried on.

Cacao is not a hardy thing like tea, but is a plant demanding much patient care; and it may be because this care had to continue unrelaxed for so long a time that we have in our midst those who scout at it, and question its profitable nature. Men who are in possession of good cacao gardens know whether the thing pays or not, and the sort of feeling among them as far as I can discover is that of an inclination of laughing in their sleeve, and satisfaction that cacao should be decried. The more it is proved on paper that the industry cannot pay, the more they like it.

The grower of cacao is, however, not without his bothers. If he has a fair field to fight these bothers in, it only adds a little zest to life; but when he feels that he is running his head against a stone wall, it is different. We can fight the borer, the porcupine, the want of shade, the cutting effects of wind, and to some extent the raid of the Sinhalese rogue; but loss of weight in London is as hard a nut to crack as the problem of the poor, and, like that unfortunate class is always with us. Cacao shipments, however accurately they are weighed on this side, invariably come out short. There is a "submerged tenth" over and above the regular allowances which goes astray in the modern Babylon, and, alas! is never reclaimed. I fancy that all cacao shippers have had, at some time or another a tussle with their home correspondents over loss in weight, and have found that "mickle din and little oo" &c. accurately describes all that was ever gained when time was called. You may enter gaily into the controversy, but you come out with a chastened spirit. One who had gone through this valley of humiliation when I made up my mind to tread its tortuous way gave me this as his painful record:—"I have gone through all the performance of correspondence, and of sheer humanity charge you to desist. You will gain nothing, and the advantages of a cool climate are so completely in the brokers' favour that wisdom dictates a moderate course." Are these the words of wisdom or pusillanimity? Let each judge for himself. I certainly did not take them as my guide, but went into this loss of weight question with the hope to see the bottom of it.

The first bone that was thrown to me to worry at and break my teeth over, was that fine, elastic, all embracing phrase "natural driage." "Natural driage" is a good general term, with an honest healthy ring about it and can account for much. If a shipment is half-a-cwt. or half-a-dozen cwt. short, all complaints when met in this way are hard to sustain. I knew a shipper of cinchona bark, irritated to exasperation through the loss from "natural driage." But he followed his produce on one occasion to London, saw the weighing done himself, and came out with an *increase* rather than the usual deficit to his friend's astonishment "Natural driage" is, however, a very subtle kind of thing, and in connection with cacao shipments holds the same place as the term electricity often does in the explanation of natural phenomena—an explanation which does not explain.

To test what there might be in the "natural driage" plea, I had a bushel of cacao carefully weighed just before packing and it turned out 38¾ lb; when it was weighed on arrival in London it was 40 lb. My friends there who were at one with me in their desire to understand the shortage in weight, when sending on the result of this test, which nailed the "natural driage" plea to the counter, put the thing in these few pregnant words:—"It will not help you much, in fact nothing will. The brokers and the trade will only recognise the sworn weighers' weights, and in our experience these are never satisfactory to the shippers."

When I got this length I thought of the cynical advice tendered me when I began the enquiry and which I have given above, as the words of true wisdom. Still I have a hankering after this "submerged tenth" of ours, and would gladly see it reclaimed. If necessary I would willingly subscribe my experience for the outfit of any prophet who may arise prepared to tackle the subject, and preach a reform.

The late showers were very welcome and have done a lot of good. Now the weather is taking up and the clear brightness of the N.-E. is with us again. If the cold wind will only be moderate things will be "booming."

The cooly is turning restless and thinking of home. If all were to leave who propose to do so, the labour force would be much reduced. But Ramasami does not always ride when he 's saddled.

PEPPERCORN.

HILL-COUNTRY PLANTING REPORT.

The weather is now simply perfect, the wind having ceased and the morning and evening temperature being that of an English summer. There is, of course, tropic heat of an emphatic character during the day. There is not a sign of rain; and the only modification of the clearness of the sky arises from the smoke of burning patanas which is floating about, and this raises a curious question. According to the Coorg Forest Report quoted in the *Observer* the other day from the *Tropical Agriculturist*, the effect of the annual burning of grass growing in forests is to improve the soil by adding to its stock of nitrogen. Mr. Bramber, the Indian tea chemist, on the other hand takes the view generally held that it is the annual burnings which keep grass lands so poor in nitrogen. The premises granted, how are we to reconcile the opposite effects? For, be it remembered, the falling leaves in the forest are burnt equally with the grass.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Jan. 8th, 1891.

ANNATTO.—Prices are a shade easier as compared with the last auctions, and 36 bags of good seeds from Ceylon sold at 2¼d per lb. For a parcel of 50 bags fine seed from Ceylon, an offer of 2d per lb. was refused, 2¾d per lb. being named as the price.

COCA LEAVES.—Of 5 bales South American leaves offered none were sold. Thin, dusty, and very broken Truxillo leaves are held for 1s per lb. A parcel of small, thick, dark brown damaged Ceylon leaves was offered at 4d per lb., but there was no demand. New York quotes higher prices—viz., 1s per lb. c. i. f. for light green Truxillo, while Huanoco leaves are reported out of stock.

OILS (ESSENTIAL).—Of 100 cases Citronella, 20 cases (in tins) sold at ⅞d per oz. Nine cases cinnamon-leaf oil sold at 1⅜d per oz.

QUININE.—We have not heard of any business in this article this week, but the market has become very dull, second-hand German bulk being offered today at 1s per oz. At the auctions 5,000 oz. B. & S. second-hand in 100-oz. tins were bought in at 12¾d per oz.

NOTES ON PRODUCE AND FINANCE.

(From the *H. and C. Mail*, Jan. 9th.)

ENGLISH REGISTERED INDIAN TEA COMPANIES.—There are altogether *sixty* different companies, with capital varying from £11,800 up to £354,000, and with an *aggregate* paid up capital of nearly £4,800,000. Add to this the mortgage debentures of about £700,000, and we arrive at a total capital expenditure of 5½ millions sterling. The cultivated area of the sixty concerns totals up about 115,000 acres. In addition to this, of course, there are all the Calcutta registered companies, as well as the innumerable *private* properties, many of which are very large, so that we shall not be far wrong in estimating the entire capital sunk at something near to 10 millions sterling. It is remarkable that with so large a block of stock the property is still so very unmarketable, and that at all times it is alike difficult either to realise or to acquire even a very small number of shares. Time, and also a more extended knowledge of the conditions under which the vast enterprise is carried on, will, no doubt, eventually cause an alteration in this prospect. Already, as has before been mentioned in our columns, various efforts of a substantial kind are being made both to induce holders to turn over their stock and to induce investment companies, private investors, and insurance and other bodies to direct their attention to these much neglected securities.

THE GROCER DARE NOT GO BACK TO CHINA TEA.—In connection with a statement made in an article on the Board of Trade returns in yesterday's *Times*, to the effect that a revival of the China trade may be expected, the following from the *Grocer* of last week is interesting. In its reference to Indian tea it says: —The consumption is again on the increase, and the total deliveries for the year 1890 will be over 103,000,000 lb. against 99,000,000 lb. in 1889, or an increase of over 4,000,000 lb. for the year, while in 1889 the increase was 11,750,000 lb. over 1888. The strides that Indian tea is making in public favour are only equalled or excelled by Ceylon growths. The public will have strong and dark-liquoring tea irrespective of flavour, and the grocer finds that only India can supply it. The value that the grocer has been able to get from 8d to 10d per lb. is striking, and he has been obliged to make use of Indian growths freely, to the detriment of poor China. Last year China teas were exceptionally poor, but although they have been better this year, yet the grocer has so cultivated the public taste that *he dare not go back to China tea*: except in the smallest way.

CHINA TEA PROSPECTS.—Messrs. W. J. and H. Thompson, in their China Tea Circular take a hopeful view of the prospects of China tea. They say: —For the past year we have to note a very satisfactory increase in deliveries, home consumption showing seven millions and export one million in excess of last year, the total amounting to 231 millions, against 223 millions. The stock on December 31st, 1890, was 11 millions less than at the same time in 1889. The large increase in the home consumption is, no doubt, chiefly owing to the reduction of duty in May last from 6d to 4d per lb., but also to the improved state of trade, which has, to some extent, benefited the large consuming classes. The increase in export from this country was quite unexpected early in the season, owing to the large purchases made in China for Russia; but the supplies of suitable qualities proving inadequate, considerable orders had still to be executed in this market. The figures for export include nearly four millions of Indian and Ceylon teas, which seems growing in favour in Russia as well as in other countries. The quality of the crop from China was again disappointing, but, in consequence of the moderate supply, prices for the finer grades of black-leaf Congous ruled very high, and were mostly taken for export. Shippers from the northern ports have had reason to be satisfied with results; from Foochow, however, the reverse has been the case, except as regards the finest chops, which sold at good profits. The quantity of the lower grades has been comparatively large, had been met with small demand beyond the moderate requirements of the trade for these classes. The total export from China promises to be about 20,000,000 less than last year, and as the deliveries for the last six months have been almost equal to the corresponding period in 1889, and with much reduced stock, the position of China tea must be considered more favourable than for some time past.

CEYLON TEA.

The *Grocer* says:—The total consumption for 1890 is nearly 38,000,000 lb. against just over 30,000,000 in 1889, and 18,500,000 lb. in 1888, thus showing an increase of nearly 8,000,000 lb. for the year, and 19,500,000 lb. for the two years. The supply for the year is about 40,000,000 lb., and the stock has increased some 3,000,000 lb. to, say, 8,500,000 lb., or two and a-half months' stock, which may be considered very moderate and quite necessary recollecting the steady, all-round demand there always is for Ceylon teas. The year's crop of 1891 is now estimated to yield 50,000,000 lb. for the London market, so that consumption will again have to make great strides to keep pace with such an import. Now the question arises, What is this extra supply to take the place of? China Congou for home consumption is already so small that it cannot well be smaller, unless it is to be wiped out altogether. Perhaps these teas will rapidly increase in favour on the Continent, and if so, it would prove a great relief—otherwise we cannot but foresee a fall in prices before the summer, which would prove very disastrous to this deservedly popular British possession. Still, the trade has little to do with this question, as supplies are so evenly regulated that dealers only supply their wants week by week; the sale of Ceylon is also so steady that buyers require to hold stock.

THE EXTENSION OF FRUIT CULTIVATION.—We learn from the *Pall Mall Gazette* that about London, in almost every direction, but especially towards Farningham, in Kent, an added extent of land is being prepared for the growth of fruit. Fields many acres in extent, are wholly arranged for Strawberries. There are scores of acres being planted with Current bushes. For the most part this vast area of fruit is destined for jam-making, an industry very large in London, which the policy of the Government as to sugar at one time placed in jeopardy. An estimate has been published in an official document, that seven of the principal jam-makers and confectioners in London use 34,000 tons of sugar per annum. It has been estimated that the quantity used in Scotland for similar purposes is about 40,000 tons per annum. The soil and climate of parts of Scotland are admirably adapted for Strawberries, and, as far north as Aberdeen they are produced very extensively.—*Gardeners' Chronicle*.

THE RAINFALL OF LAXAPANA ESTATE, MASKELIYA.

Laxapanagala, "the mountain of the hundred thousand lamps," is so called because bands of pilgrims to Adam's Peak were and we suppose still are in the habit of congregating at its base and there lighting their lamps at midnight preparatory to the ascent of the mountain of the Sri Pada (sacred footstep), so as to reach the summit before sunrise. It is one of the chief flanking ranges of the central mountain, and nearly 6,700 feet above sea-level, so that it ought to and does intercept a considerable portion of the rainfall of the south-west monsoon. But the estate of Laxapana is evidently less fully exposed to the monsoon current than is Theberton at a straight line distance of three miles; for while the average rainfall of Theberton (the rainiest position on the Surveyor-General's map) is 217 inches, the average of Laxapana is only 147 inches. Mr. George Greig, in sending us his very interesting diagram, coloured and conveying to the eye a vivid idea of the rainfall for each month and each year of the past fifteen,—notices the curious reduction, of the average from 157·35 inches in the first 11 years to 121·21 by the results of the last 4. As there seems to have been no failure of the south-west monsoon generally, the question naturally arises whether there has been any change in the locality of the rain-gauge, or any erection of buildings or growth of a grove of trees which might affect the local results? The figures on which the largely differing averages are founded, are as follows:—1876 133·30 inches; 1877, 176·10; 1878, 159·05; 1879, 177·65; 1880, 141·62; 1881, 155·83; 1882, 191·62; 1883, 151·07; 1884, 143·05; 1885, 147·53; 1886, 153·72. These are the years (11) and figures which established, apparently, the rainfall of the estate at an average of 157·35 inches. Then came the remarkable decrease which in four years brought the average of those years down to 121·21 inches, thus:—1887, 118·80 inches; 1888, 133·52; 1889, 125·90; 1890, 106·61. In this the lowest year of all at Laxapana, the rainfall at Elfindale, down the valley, was considerably more than double the quantity, not less than 249·33 inches. We have little doubt that the record for the neighbouring Theberton will considerably exceed 200 inches, so that the persistent diminution of rainfall at Laxapana for 4 years, until we get only 106·61 inches in 1890, against 191·42 in 1882, is one of the most puzzling of meteorological phenomena we have met with. We have records of great discrepancies in particular years, but here we have a sunspot period of 11 years giving an average, which might well be relied on as true and permanent, of 157·35 inches; while the average of 4 years succeeding 1886 gave an average of only 121·21. The average for the whole fifteen years was thus brought down to 147·71 inches. We might adduce the explanation of the commencement of a cycle of drought in 1886, but for the continuance of records of normally heavy rain in the neighbourhood. We seem shut up, therefore, to some local cause of changed position of rain-gauge shelter, of buildings or trees, change of the gauge itself, or change in the observer?

The monthly averages are given as follows:—January 2·67 inches, February 2·28; March 5·09; April 10·35; May 17·85; June 27·19. In 1888 the rainfall of this month at Laxapana was 44 inches, against the enormous deluge of 84 inches at Theberton; July 22·20; August 18·75; September 12·14; October 16·68; November 9·65; December 7·76.

Looking at the rainfall map, it is interesting to notice how the deposit of moisture increases as the monsoon current sweeps from the western shore at Colombo, inland. The average at Colombo is in round figures 89 inches; then a little to the eastward amidst the foot hills is Labugama with 161 inches; at about an equal distance again, and still amongst the lower hills comes Pambagama with 163 inches; finally we come to the rainiest centre in our mountain region and find Theberton, at the elevation where the mass of the rain clouds strike and are cooled down by the mountains, 3,315 feet, with 217 inches. But for some intercepting hill or spur, Laxapana ought to be well up to a similar figure. Local features, however, divert both wind and rainfall very materially.

GAS DIRECT FROM THE MINES.

Dear Sir,—Having read with interest the letter of Hon. R. Russell on the abatement of the smoke nuisance, and having experienced the difference in Pittsburg, U.S.A., since natural gas was introduced there, I beg leave to submit the following suggestion.

In the United States natural gas is already piped fifty or sixty miles, and it has been proposed to pipe it 250 miles or more to the seaboard. Fetching the crude coal to London by rail involves using a car that often weighs as much or more than its load, the car having to be hauled back empty. The coal then has to be hauled to the house, carried to the cellar, carried up to the fires, and finally, the ashes carried away, and the soot and dirt created in the room cleared up. As a matter of fact, we consume our coal at great loss by first heating it in the grate and then burning the gas it evolves.

As I sit by a glowing gas fire, I imagine that—

1st. The gas consumed in London is immensely enhanced in cost by the transportation of the raw coal to the gas works in the city.

2nd. That a very cheap *heat* gas could be produced from coal.

3rd. That gas could be manufactured *at the mines* (the nearest of which are about 110 miles from London) and piped to the City with great economy and at a great reduction from present rates.

4th. That the towns and dwellers along the route between the mines and London would take a liberal supply also.

There may be some practical difficulties to be overcome, such as forcing or sucking gas long distances, leakage of the pipes, etc., but these do not seem insuperable nor even very great.

The cost of the plant, in pipes, may be large, but the economy would seem to be so great as to recoup that.—Respectfully. HORACE J. SMITH.

44, Grosvenor Road, London.

—*Speaker*, Dec. 27th.

INCREASED DEMAND FOR JUTE.

Government encouragement for the production of jute in the lower Mississippi valley has proved a failure. The quantities raised are not sufficient to cover even a small fraction of the annual cotton crop. Even under high cultivation the plants have failed to obtain the luxuriant growth of those raised in India. The difference in the cost of labor in India and this country, together with climate disadvantages, apparently renders it impossible for us to compete in the production of this article.

The plant requires a very strong soil and comparatively little cultivation. The regions in which it is grown were originally swamp lands, which were carefully drained under the direction of the English government. Being carried to Dundee as ballast over fifty years ago, it fortunately came under the inspection of a French weaver, who studied its properties

and succeeded in making the first yard of jute bagging Dundee has ever since been the chief manufacturing centre of articles made from jute. From 207 208 bales imported into Dundee in 1870, there was a rapid increase, until in 1883 the imports amounted to 1,013,109 bales. Within the last seven years new methods of decorticating jute have been invented, and cloths of finer texture can now be made, so that the increased demands have caused the imports to advance even more rapidly than during the preceding thirteen years.

Many substitutes have been tried for jute by southern manufacturers. None of these have as yet been made a success. Cotton bagging has been made for several years. The objections have been the expense and failure to protect the cotton from dirt and moisture. Several of the firms which have tried to manufacture it have either failed or turned their attention to some other field until there are but two left, and these are doing business only on a small scale.

The process of making cheap bagging from the fibres of the cotton plant is still in its infancy. Favorable reports of its development have been received from several sources during the year. This may in time prove a success, but at present the outcome is doubtful.

No material is manufactured at less cost per yard than jute. After cost of production, shipment to Calcutta, insurance charges and ocean freight have been added, it is placed upon the American market at an average price of 3c. per pound, and at this low rate the profits are large. The bagging made from it is exceedingly strong and can endure almost any amount of rough handling. It has frequently happened that when cotton bagging has given out in course of transportation jute bagging has been substituted. Many steamship lines refuse to carry cotton as freight if covered with any substance other than jute.

The increase in the size of the cotton crop is well shown in the increased demand for jute bagging. The mills, although they have been greatly enlarged within the past year, find it impossible to keep up with their orders. Manufacturers have given consumers the benefit of the change in tariff rates. The imports for the last ten years in tons were as follows:—

	Tons.		Tons.
1880	82,471	1885	98,343
1881	68,631	1886	83,054
1882	84,186	1887	88,514
1883	125,318	1888	115,163
1884	64,389	1889	88,665

—*Bradstreet's.*

LABOUR SUPPLY IN THE STRAITS.

Ex-Ceylon Planters Giving Evidence.

LABOUR COMMISSION.—Present, Capt. Cameron, Messrs. Powell, Turner, McGregor and Brown.

Mr. John Anderson recommended a Government agency in Singapore, abolishing independent coolie depôts and brokers. If the Chinese Government could be persuaded to co-operate in the emigration it would do good. There should be fixed rates for brokerage and importation expenses, and over-charges should be made penal. The trade should be encouraged to remain in Singapore as a distributing centre. Direct traffic with North Borneo was not to be encouraged. Cost to Darvel Bay would be $65, while through Singapore it was about $95. He thought the direct traffic to Sumatra from China was no cheaper, and in some cases dearer, than through Singapore. He objected to estates being harassed by medical or other Government officers, when if left alone they were getting well enough. Witness had been in the Government service (laughter). The Trafalgar Estate would be better closed than further hampered.

At 1-30. the Commissioners adjourned until Monday, at 11 a.m.

Singapore, Jan. 19th, 1891.

Present:—Capt. Cameron R. E. President, Messrs. J. Turner, A. Macgregor, E. A. Brown (Secretary) and R. P. Gibbes (Assistant Secretary).

Mr. C. E. St. Caulfield, Manager Pulo Obin coffee and pepper estate, had been connected with the estate for nearly three years; in the Straits 9 years and in Ceylon since '58. Free Tamils are employed on Pulo Obin, formerly Javanese were employed there, and over also indentured coolies. The latter were unreliable in their work and regularity, and were more expensive, so their indentures were cancelled and they were employed on higher pay as free coolies. He used to be on Loon Choo estate. Did not see any way to avoid unsatisfactory Contract labour. The headmen bring enough. He considered it unsatisfactory to take a coolie to court at present. A monthly indenture was sufficient. Of course if any inducement the coolie would leave but the contract had no effect in that respect, the only way of keeping the men being by offering them sufficient inducement to stay. The headmen got them from India at their own risk, being paid their charges. They receive no payment until the men actually arrive at the Estate. If they ran away before the charge is repaid the headman was responsible. They had no difficulty in getting sufficient coolies or in keeping them. The arrangements for the Native States, owing to the keen competition, were not satisfactory. When a man ran away there was a great deal of difficulty to get them back again. More protection was needed for the employers and more coolies were wanted. A system of discharge tickets, without which employment could not be obtained would be useful. That would only keep a man till the end of the month; but unless there was a good reason other employers would not take him on. That was the system in Ceylon, where there was a great demand for labour and it answered very well there. It was an understood thing among planters that a labourer was not to be taken on without knowing where he came from. The employers here should combine to fix a maximum rate of wages and work the discharge certificate system, on all estate work throughout the States and the Colony. It would not be possible to make it illegal to employ others than those with a discharge ticket; the planters themselves must agree upon it. In Pulo Obin he had sufficient coolies; the headmen brought them; there was no legal contract with headmen; their disbursement was examined. The rate of wages was unduly high but paying that rate was the only way to keep them. His coolies were paid for Sunday labour, although they did not work: this had a good effect. Twenty days was the average work of an ordinary coolie; a good man did 24. The only guarantee that a new man came fresh from India was his appearance, which was unmistakable. The tindal made a good profit out of the coolie, no doubt. Government was a large employer; it should agree not to take on men without a discharge ticket. Recruiters did exaggerate but the coolies wrote home telling their friend what they got, and that it was the usual rate of pay. The rate of wages should vary with the price of rice, say from 18 to 20 cents a day. Sufficient coolies would be got without contract or indenture of any kind whatever. The demand at Pulo Obin was not of course so keen as in the Native States, but combination would do much to prevent crimping. The exceptions would be so few that it would not matter. The reasonable cost of a coolie from India would be $10 to $12; it varied from $6 (without passage) to $17. The Planters' Association could settle as to the amount of wages to be paid for different kinds of work, and it would be fixed by the price of rice. Increased cost of carriage to a distant estate would be a fair charge on the estate.

Mr. W. Turing Mackenzie, manager of Michaelstowe Estate, Johore, and in charge of Drumduan Estate; had been in the Straits two years and 14 years in Ceylon. He had only a few Chinese. He had no indentured Tamils now, though they were nearly all originally indentured, a few being picked up here. He had no experience of indentured Tamils and wanted nothing to do with them. Had never got any new coolies here, though one trial had proved lamentable, five coolies (two persistent malingerers, and two sick ones) having cost $360. That was partly the fault of the recruiter he sent but partly the fault of Ordinance. He knew the latter was in force but did not know it threw so

many restrictions in the way. There wore so many serutinies, and then useless men were passed. The licensed recruiters interfered with his man, he believed. He was full handed at Michaelstowe, with Kelantan Malays. At Drumduan the tindal could get plenty of men. The rate paid 23 to 24 cents a day was very high; it was wealth to a Tamil, but the remedy was to let the market settle itself, importing plenty of free labour. This could not be done on a large scale but by degrees, as in Ceylon 40 years ago. Everybody should get his own men and not crimp then the rate of wages would settle itself. Government contractors offered a premium to high wages, paying $9 a month. The coolies liked Government service because they got nothing to do; that was laxity he supposed on the part of Government. He objected to Sunday labour but sometimes it was unavoidable. He objected entirely to the system of Government inspection; it gave the coolie an idea that the Government official was a superior. The estate was put into a ferment and the coolies were perpetually running to him with all sorts of complaints. That was partly owing to the manner of tho inspection and partly a factor of the system. Any accounts to bo rendered and books examined to see that the coolies were properly paid he did not object to. Would not restrict the number of women on an estate; they could do work with the men. The rations his men got were 10 kati every Saturday, for five days work. For 4 days five kati. On this they could save 10 kati a month; *i. e.*, they lived on $1·80 a month. Was quite sure they could live well on this. In some respects Ceylon 40 years ago could be compared with the Straits: they were beginning in a small way then as we are now. The place must be advertised in India and people would then come over. He objected entirely however to Government recruiters, who did a lot of mischief.

In reply to Mr. Macgregor, Mr. Mackenzie said it would be more expensive getting them here than in Ceylon; paying for the tindal's passage and tho men he got, and then 25 cents a day pay. Tea would not bear the expense; coffee would. He employed nearly all Kelantan Malays at Michaelstowe. No planter should employ a man who could not produce a discharge from his last employer. The Public Works Departments and contractors took away a lot of men; a contractor could not be bound down not to take men away from estates but Government ought to import its own men. He did not object to a contract but "36 months was very like slavery." Three months were sufficient and if a man had not paid off his charges let the man who wanted to crimp him pay it off. He did not think a high rate of wage would have much effect in increasing the regularity of the coolie working. If a man began to save he was willing to work harder to add to his hoard. His Kelantan men at Michaelstowe average 17 to 18 cents a day; they were much better than Javanese. He thought large numbers could be induced to come down. He had a few Javanese on fixed salaries. There was nothing in the shape of a Planters' Association in Johore; he had tried to form one but it fell through, the distances wore great. In the case of Tamils the tindal kept his accounts with the men carefully; there were very few complaints of this. The men signed a promissory note to the tindal but no agreement. A monthly contract would be sufficient, if the coolie had to produce his discharge ticket before getting fresh employment.

The commission then adjourned.—*S. F. Press.*

ADVERTISING CEYLON TEA.

The tea planters of Ceylon are certainly indebted to Messrs. Charles Mackwood & Co. and their manager Mr. Wilson Smith for a capital advertisement of Ceylon tea in the universal notice which has been taken in the home press of the sale of Galbodde tea up to 87s and 110s per lb. Here are a few specimens of the notices. The Conservative *Globe* says:—

That wonderful tea which was sold the other day at £4 7s a pound has changed hands again, it appears, at £5 10s a pound. A profitable transaction that! In this connection, we may observe, a correspondent writes to protest against the imputation of extravagance levelled against those who drink this tea. "Why, in the name of common sense," he asks, "should fault be found with us if we choose to drink tea that costs us eighteenpence a cup? No one attacks wine-bibbers who pay double that for a glass of some rare vintage."

The Radical *Star* again:—

Tea at £4 7s per Pound. J. S. Holloway, 29, Mincing-lane, writes:—A short time back you made mention in *The Star* of a special lot of tea that sold in public sale at £1 10s 6d per pound. Today (Tuesday) a parcel of golden tips, containing 15 pounds in all, sold at £4 7s per pound. Never since tea has been known has such a price been given. It came from the well-known Gallebodde Estate in Ceylon. A hands mo profit has since been offered for it.

The *Chemist and Druggist* has the following notice:—

EXTRAORDINARY TEA PRICES.—The highest price by far ever realised for tea in London, and probably any where else, was paid this week for a small parcel of 15 lb. flowery orange pekoe, from tho Gallebodde estate, in Ceylon. This parcel was sold by public auction amid a scene of great excitement at the price of 87s per lb. in bond. The highest price ever known previously was paid a few months ago for an equally small consignment of Ceylon tea from the Hethersett estates, which then realised 30s 6d per lb.—a price that has probably stimulated the Ceylon planters to send over tho present parcel. A sample of the tea, which we had occasion to inspect today, shows it to consist mainly of very small tips of a colony resembling that of pale Turkish tobacco The tips, have been evidently separated from the larger body of black leaves of the tea by the process of pressing a piece of flannel upon the bulk. By this method the tips in question, being covered with a fine down, adhere to the flannel, while the smoother black leaves remain behind. It would, of course, be possible to obtain an almost similar tea from any fine golden-tipped Pekoe on the market, and the price obtained for this particular lot was quite a fancy one, and it will probably not be maintained, by any means, if the Ceylon planters were to send over any large quantity. It is said that part of the consignment, if not the whole, has passed into the hands of the United Kingdom Tea Co. (Li ited) of 21 Mincing Lane, and it is added that some of it has since been resold at the extraordinary price of 110s per lb. From China tea no such quality as that sold this week could have been obtained, but some of the better grades of Java tea contain a large proportion of silvery tips, which might be separated by a similar process. The finest teas have hitherto been used, as a rule, we believe, in Russia, Persia, and Morocco. Some twenty or thirty years ago the finest flowery Pekoe from China was regularly shipped to Russia either via Persia or via London, but since then that tea has gone out of fashion among the Russian consumers.

And *Colonies and India* remarks:—

Ceylon tea is certainly booming. At the London Commercial Tea Sale Rooms, in Mincing Lane, the other day, a consignment of tea from the well-known Gallebodde Estate, which experts in the tea trade describe as being the finest tea ever grown, was put up for sale by auction. The bidding for this unique tea caused unusual excitement in the sale rooms, and after being carried on with unprecedented competition between the principal firms in the wholesale tea trade the lot was at length knocked down at the amazing price of 87s. a pound, a figure which has never been anything like approached in the annals of the tea trade. The eventual purchasers of this tea were the United Kingdom Tea Company (Limited). The tea os of the most extraordinary quality, the leaves being of the brighest golden colour, in appearance almost resembling small pieces of gold. Untiring care and attention must have been bestowed on its growth, and

it certainly reflects the greatest credit on the manager of the Gallebodde Estate that he has succeeded in producing such a perfectly wonderful and previously unheard of specimen of tea.

THE YATIYANTOTA TEA COMPANY, LTD.

Report of the Directors for presentation to the annual ordinary General meeting of the shareholders to be held on Friday, 13th February 1891, at noon.

The Directors have pleasure in submitting to the Shareholders the Accounts of the Company for the past year.

Owing to labour difficulties in the early months of the year the crop secured was less than was estimated, but as the labour supply is now ample for all requirements and as the whole Estate has been recently pruned, it is expected that a large increase in the yield will result in the current year.

The total crop was 154,303 lb. of made tea, which cost, laid down in Colombo, R39,094·35 and netted R68,344·01 or about 44¼ cents per lb. as compared with 48 cents per lb. for the preceding crop. The Directors attributes the falling off in the average price to the higher rates of Exchange ruling during the year. The expendit re includes cost of manufacturing 10,728 lb. of tea fora neighbouring estate, credit being given in the acconnts for receipts under this head.

After making the usual provision for depreciation of Buildings and Machinery, the net profit for the year (including the balance from 1889 account) amounts to R23,002·87, of wich R10,800 has been absorbed in paying an interim Dividend of 12 per cent. The Directors propose to apply R11,700 in paying a further dividend at 13 per cent (making 25 per cent for the year) and to carry forward to next year's account the balance of R502·87, which they hope will meet with the approval of the Shareholders.

Arrangements have been made for planting further 30 acres in tea this year, which will bring up the cultivated acreage of tho Estate to 488 acres.

The crop in 1891 is estimated at 180,000 lb. tea against an estimated outlay on the estates of R44,200 and it is anticipated that the sum of R4,000 will be spent during the year on the new clearings of 84 acres.

In terms of the Articles of Association, Mr. A. Thomson retires by rotation from the office of Director, but, being eligible, offers himself for re-election.

The appointment of an Auditor will rest with the meeting.

Dr, BALANCE SHEET 31ST DEC. 1890.

LIABILITIES.			R c.
To Capital—			
100 Shares at R900 per share ...			90,000 —
To Extension Fund Account—			
Balance of this Account			6,500 —
To Debts and Liabilities of the Company—			
Due to Chetties, Coolies and others as per Superintendent's Balance Sheet	10,687 84		
Due to We-Oya Tea Company Limited	810 69		
Auditor's Fee	50 —		
			11,548 53
To Profit and Loss Account—			
Balance of this account ...	23,002 87		
Less Interim Dividend paid ...	10,800 —		
			12,202 87
			R120,251 40

Cr. ASSETS.				R. c.
By Property (Immovable) held by the Company viz:—				
Polatagama Estate				
Land				64,938 66
Buildings original cost ...			23,118 42	
Less written off, viz:—				
3-10ths of R15,499 22 (1888)	4,649 76			
2-10ths of R 5,004 75 (1889)	1,000 95			
1-10ths of R 2,614 45 (1890)	261 45			
		5,912 16		
			17,206 26	
Expenditure on Clearings 1889 and 1890			8,343 49	
				90,488 41
Abamalla Land				6,686 70
By Property (Movable) held by the Company, viz:—				
Polatagama Estate				
Machinery original cost			16,159 05	
Less written off, viz:—				
3-5ths of R13,809 37 (1888)		8,285 62		
2-5ths of R 2,015 81 (1889)		806 32		
1-5ths of R 333 87 (1890)		66 78		
			9,158 72	
				7,000 33
Stock in Trade				
Value of Tea unsold (since realized) ...				7,359 62
By Debts due to the Company (considered good)				
Coast Advances			6,217 39	
Sundry amounts due to the Estate for lent labour &c. as per Superintendent's Balance Sheet ...			1,700 09	
				7,917 48
By Cash				
In Bank on Current Account				798 86
				R120,251 04

POLATAGAMA ESTATE WORKING ACCOUNT, 1890.

			R. c.
Dr. To expenditure for year as per Superintendent's Monthly Reports ...		48,550 90	
Less Expenditure on Permanent works transferred to debit of Polatagama Estate, viz :—			
On Buildings... ...	2,614 45		
On Machinery. ...	333 87		
On New Clearings ...	6,508 23		
		9,456 55	
			39,094 35
To Balance carried down...			30,543 32
			69,637 67
To Amount written off for depreciation, viz :—			
1-10th Cost of Buildings...		2,311 84	
1-5th Cost of Machinery...		3,231 81	
			5,543 65
To Balance transferred to credit of Profit and Loss Account...			24,999 67
			R30,543 32
Cr.			
By net proceeds of 165,031 lb Tea...		73,052 06	
Less for 10,728 lb. Tea manufactured & sold for We-Oya Estate...		4,708 05	
154,303			68,344 01
By Receipts for manufacturing Tea ...			1,287 30
By Bonus on Fire Insurance 1888 ...			6 37
			69,637 67
By Balance brought down...			30,543 32
			R30,543 32

Dr.

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDING 31ST DECEMBER 1890.

	R. c.
To Payment of Dividend for 1889 at 25 per cent...	22,500 —
To Amount transferred to Extension Fund account...	6,500 —
To Balance carried down	475 18
	29,475 18
To Director's, Inspector's and Secretary's fees and Office Rent for the year... ...	2,000 ...
To Stationery, postages and sundries ...	192 65
To Interest	229 33
To Auditor's fee	50 —
To Balance	23,002 87
	R25,474 85

Cr.	R c
By Balance of Profit at 31st December 1889...	29,475 18
	29,475 18

By Balance brought down...	475	
By Balance transferred from Working Account	24,999	
	R25,474	85

Audited and found correct.
(Signed) R. Lewis M. Brown, Auditors
(Signed) A. Thomson, W. H. G. Duncan, Chas. Young.
Directors
" G. W. Carlyon, Secretary,
Colombo, Jan. 24th 1891.

THEFT OF CACAO.

No. 5,802.—Jalaldeen, conductor of the Grove estate, charged one Jeronis Appu of Dumbukola with theft of about a lb. of cacao seed, the property of Mr. J. H. Barber, valued at 50c. The following is the judgment:—

The evidence in this case is meagro, but in the absence of any explanation from the accused as to how he eame by he c acao found in his house it is sufficiont to convict the accused. Mr. Barber's estate is robbed of cacao on the night of the 20th instant. On the morning of the 23rd, the accused is seen bringing a pot of ripe cacao seeeds cently shelled and concealing it in the spout of the houso where ho is a lodger. He lives within ten chains of the trees from which the pods were broken off. The seeds in his possession appear to have been shelled about three days before they were brought to the house, tallying thus with the time when the pods were stolen. In quantity they answer to the quantity which would be the outcome of the stolen pods. The seeds were obviously put away from observation, for they were concealed inside a spout over which the two eaves of the maduwa and the house meet. That is not a place where an honest man would stow away cacao seeds honestly come by. The poor old woman in whose house the accused lives, frighteued by the discovery of the cacao seeds, which she found in the pot the accused was seen stowing away in the spout, calls in a labourer or watchman of Ukuwela estate and gives him information of what she had seen. She is a most truthful old creature and was no doubt impelled to give this information by the thought that if the stolen cacao was found in her house, she may be m ade responsible for it. At all events, that very day the arachchi comes with the conductor and takes the cacao from where it was concealed. The accused was not in the house at the time, but it is clear that either he or the old woman must have put the cacao there. I believe upon the evidence that the accused put it there. He has elicited from the arachchi of his village by cross-examination what I could not have elicited, viz., that he has the roputation of being a thief in the village. He is besides a convictod gambler. He has practically no defence to make. His witnesses whom he called provo nothing, and he does not in the smallest degree account for the cacao seeds found in his possession.

When within a fow days of the theft of cacao from a complainant's trees, the accused is found in possession of cacao seeds, recently shelled, corresponding in quantity to what would be the outcome of the stolen pods—the cacao seeds being further put away into an out of the way place within the precincts of where the accused lives and obviously put away for concealment,—I think I am reasonably entitled to conclude, in the absence of any satisfactory explanation, that the accused is the thief.

I find the accused guilty and sentence him to two months' rigorous imprisonment.

(Signed) J. H. EATON, P. M.

THE CEYLON SPINNING AND WEAVING COMPANY, (LIMITED).

Report of the Directors for the year ending 31st Dec. 1890, presented at the general meeting held at 1 p.m. today.

The Directors now submit the annexed statement of accounts up to 31st Dec. 1890, from which it will be seen that the net available balance is R8,456·63; this is equal to over 5 per cent per annum on the paid-up capital for the five months the Company has been working, but, at this stage of the Company's existence, and in view of its requirements, the Directors recommend that a sum of R4,000 be placed to a Reserve account, and that the sum of R4,456·63 be carried forward. The erection of machinery occupied the early months of the year, and the getting of the various appliances into working order (necessarily a slow process) cannot be said to have been accomplished till the end of July. The working period therefore comprises the months from August to December inclusive. During that time steady progress has been made in Spinning and Weaving, and it is expected that a gradual increase in production will now take place. The Directors have felt that the prospects wore sufficiently encouraging to warrant them in ordering 68 more looms. Six of these have arrived, and the rest are on the way, and will be erected in the existing Weaving Department, thereby filling the present available space in it. In order to pay for machinery, it will be necessary to rise some additional capital, and it is proposed to do this by the issue of debentures, or by such other means as may be considered more favourable in the interests of the Company. The directors consider that the results attained so far go to show that the expectations formed at the formation of the Company are likely to be gradually realised, and they congratulate the share holders on the prospects before them. The directors who retire are the Hon. J. J. Grinlinton and F. J. de Saram, Esq., and they are eligible for re-election.

BALANCE SHEET OF THE CEYLON SPINNING AND WEAVING COMPANY, LIMITED.

Made up to 31st December 1890.

Dr. Capital and Liabilities.	R	c.	R	c.
I. To Capital :—				
3,667 Shares paid R100 per Share	366,700	00		
120 do 80 do	9,600	00		
55 do 60 do	3,300	00		
50 do 40 do	2,000	00		
60 do 20 do	1,200	00		
48 do 10 do	480	00		
			383,280	
4,000				
Particulars of arrears will be found noted below.				
II To Debts and Liabilities :—				
Debts for which acceptances have been given ...	291,261	13		
Debts for Machinery and Stock in Trade	17,952	73		
Balance of Wages due ...	3,672	22		
Petty Cash	4	96		
			312,891	04
VI. To Marine Insurance Fund			730	00
VII. To Profit and Loss ...			8,456	63
			R705,357	67
Cr. Property and Assets	**R**	**c.**		
III. By Property held by the Company :—				
Immovable Property :—				
Freehold Land	15,116	44		
Buildings	145,038	75		
			160,155	19
Movable Property :—				
Fixed Plant	123,140	97		
Spinning Machinery ...	190,803	38		
Weaving do ...	106,269	26		
Ginning do ...	2,790	64		
Furniture	1,126	53		
			424,130	78
tock in Trade :—				
Cotton	27,442	80		
Yarn in process, Yarn and Waste	9,298	40		
Cloth in Stock and Yarn in Weaving Room ...	28,482	31		
Stores	22,358	35		
Fuel	2,335	48		
			89,917	
IV. Debts Owing to the Company :—				
Debts for which the Company holds Bills	3,703	12		
Debts for which the Company holds on Security ...	1,952	73		
Colonial Store Deposit ...	50	00		
Interest due by Shareholders in arrears	1,635	05		
Consignment account ...	22,619	72		
			29,960	62
V. Cash in the Bank of Madras			1,193	71
			R705,357	67

STATEMENT OF PROFIT AND LOSS FROM AUG T 31ST DECEMBER 1890.

Dr.	R	c.	R	c.		c
To Yarn Production Account Balance 31st July ...			24,774	26		
Cottou Expeuditure	77,499	25				
Stores do ...	1,302	91				
Fuel do ...	2,035	90				
Wages do ...	8,825	83				
			89,663	89		
			114,438	15		
Less Yarn transferred tn Weaving Room ...			50,040	12		
					64,398	03
To Cloth Production Account Balance 31st July ...			29.531	58		
Yarn received from Spinning Rnom	50,040	12				
Stores Expenditure	4,704	69				
Fuel do ...	2,035	90				
Repairs do ...	188	56				
Wages do ...	10,727	93				
			67,697	20		
					97,231	58
Agents and Secretaries, Allowance for Office Establishment ...	2,500	00				
Agents' Commission ...	1,884	53				
Salaries ...	3,875	00				
To Priuting and Stationery, Stamps & Telegrams ...	880	07				
Charges,and Transport and Tolls ...	1,484	73				
Interest ...	5,354	15				
Rents ...	577	00				
Directors' Fecs ...	1,250	00				
Auditors' Fees ...	200	00				
Fire Insurance ...	552	00				
Legal Expcuses ...	75	90				
			18,633	38		
Balance net Profit ...					8,456	63
Total Rs.					188,719	62

Cr.	R	c.	R	c.		c
By Yarn Sales ..			59,505	13		
Add, Value of Cotton in Mixiug Room ...	2,794	92				
Add, Value of Yarn in Process ...	3,805	35				
Add, Value of Yarn in Bales ...	1,503	80				
Add, Value of Waste, &c. ...	1,194	33				
			9,298	40		
					68,803	53
Cloth Sales ...			88,783	72		
Add Value of Yarn in Weaving Room	8,077	41				
Add Cloth in Stock	20,268	89				
			28,346	33		
					117,130	05
Transfer Fees ...					100	00
Miscellaneous Receipts					2,686	04
Total Rs.					188,719	62

Examined and found correct, S. T. Richmondy W. E.Taylor, Auditors.

RAILWAY TRANSPORT OF CARDAMOMS:

THE NEED OF CONSIDERATION AND ATTENTION IN KANDY.

One interested writes to us about a matter which doubtless affects all cardamom owners in the Kandy districts and which, therefore, ought to receive the early attention of the Railway Traffic Manager. The complaint is as follows:—

With cardamoms sent down green for curing in Colombo, quick transport is *the* essential to success. On an estate 8 milos from Kandy, we send off coolies specially after 4 p.m. with cardamoms who reach Kandy at say 6 p.m. These cardamoms are not forwarded by the Railway authorities till tho 1 p.m goods train of the following day, reaching Colombo about 7 p.m. (too late for removal), and reach the Colombo store about 10 a.m. on the third day. There is a goods train which leaves Kandy at 5 a.m. in the morning, but all goods for it must reach Kandy before 5 p.m. of the day before, as the goods office closes then. And although we have sent coolies in by night to arrive at Kandy at 4 a.m. goods will not be received after 5 p.m. of the day before for the early morning train.

Now surely some arrangement might be made to allow of quicker transit, either by opening the goods office for a short time at a later hour say 9 p.m. or by allowing goods brought at 4 a.m. to be forwarded by the morning train.

TEA IN LAGGALA, MATALE EAST.

EXTENSION OF CULTIVATION.

There can be no question that Messrs. Barlow & Co. (large Manchester dealers in tea) have got a splendid bargain in the group of properties which includes Brae, Lauragalla, Foyers and Dell, covering some 1,083 acres of which 180 are in tea, the price being £4,500 cash. A short time ago, the group was valued at over £6,000 for a Company. The tea on Brae is very fine, and it is the intention of the purchasers to open and plant some 300 acres additional as soon as possible perhaps this year.

The same firm is likely to purchase the Hattanwella and Rock Park properties in the same district.

CULTIVATION OF RICE IN RUSSIA.—The Russian Agricultural Department is about to attempt the cultivation of rice in the southern provinces. The rice with which the experiments are to be tried is an early and quickly-ripening variety found in China. It is a very difficult matter to obtain this rice, for its sale to private individuals is prohibited.—*European Mail*, Jan. 16th.

VALUE OF MINERALS AND GEMS PRODUCED IN INDIA IN 1889.—The total value of minerals and gems produced in British India during the year 1889 amounted to R1,72,67,357, and those in Native States to R71,70,222, making a total of R2,44,37,579. Bengal heads the list with R58,47,439; next comes Mysore with R51,13,104; then Madras with R33,78,707,; Bombay with R21,05,602 (this includes Sindh and Native States), &c., and Coorg R28,185. As regards the production of gold, Mysore stands pre-eminent with a money value of R42,62,050; followed by Madras with R1,39,473. The other places are Punjab R14,866; Kashmir R6,020; North-Western Provinces and Oudh R4,400; Bengal R2,000, and Burma R1,800.—*Indian Engineer*.

CINCHONA BARK AND QUININE.—We call attention to the very full and valuable annual Report afforded by Messrs. C. F. Bohringer & Son, which will be found on page 630. It will be observed that the price of Sulphate of Quinine which was 40s on 1st January 1822 is given on 1st January 1891 at 1s to 1s 1d! The exports from Java have advanced steadily from 420,668 lb. (Amsterdam) in 1882-3, to 4,750,000 lb. in 1889-90, and the sales of bark at Amsterdam show a large rise last year, whilo those in London are rather less than usual. The exports from Ceylon, India and Bolivia of bark all show a falling-off, while the consumption of quinine in North America has greatly increased last year, thus,—

1889 ...	... 2,825,008	ounces.
1890 to 20th Dec.	... 3,374,300	„
Increase ...	549,292	„

Stock in London of bark show a considerable falling-off—over half-a-million lb. at the end of 1890, as compared with the close of 1889. Altogether, therefore, the prospect is of a rise in the value of bark at an early date.

TEA CULTURE IN CEYLON.

YIELD OF TEA AND COST OF PREPARATION IN MATALE EAST ON OLD COFFEE LAND AND ON VIRGIN FOREST LAND.

We are indebted to Mr. Joseph Fraser of Damboolagalla—one of the finest of Matale East coffee estates thirty to forty years ago—for affording us once again the very carefully prepared and most interesting annual statement of his experience as a tea-planter which we append. We suppose there has seldom, if ever, been published, so detailed and elaborate a return and all interested in our Tea industry may well feel obliged to Mr. Fraser for the trouble he has taken and his readiness to give publicity to his figures. The statement chiefly applies to last year; but we have added comparative figures as given for the previous three years. The steady increase in the yield year by year over all the fields will be specially noted and also the much heavier crops gathered from virgin soil, and land only cropped with cinchona, than from old coffee land. Next the extremely moderate expenditure in proportion to crops, the average cost of 154,964 lb. f. o. b. being only 28·2802 cents. per lb. notwithstanding that more than 16 per cent. of that is for "manuring." With so good a margin, Damboolagalla crop could not fail to pay well. Indeed, we may mention that the net return for the whole crop of 1889 f. o. b. is such as to make the percentage of profit on outlay, we should think as good as that of any of our celebrated Tea Companies. What Mr. Fraser says about his manured fields will be carefully noted and indeed his figures and remarks altogether cannot fail to afford much food for comparison and reflection by practical planters who are striving as well as they can to make the tea industry a profitable one.

DAMBOOLAGALLA ESTATE, MATALE.

Statement of Made-Tea secured, yield in lb. per acre, and actual cost per lb. for year ending 31st December 1890, with rainfall, and comparative yield per acre for 1887, 1888 and 1889 :—

TOTAL YIELD OF 383 ACRES AND COST PER LB. F.O.B. COLOMBO IN 1890 :—

	Cost per lb. cts.	Total Cost. R. c.
Superintendence	3·7834	5,862 83
Tools	·2059	319 01
Lines	·0159	24 68
Stock	·0897	138 91
Roads	·1983	307 30
Clearing up Ravines	·0999	154 81
Fire Insurance	·1218	188 75
Timber Trees	·1809	280 34
Contingencies	·5488	850 40
Supplying	·2265	351 02
Manuring and Burying Prunings ...	4·7672	7,387 38
Drains	·4457	690 69
Weeding	2·9119	4,558 88
Pruning	·6943	1,075 92
Tea Factory	·1099	170 31
Plucking and Baskets	8·1771	12,671 68
Manufacture	·7702	1,193 66
Fuel	·4801	743 91
Packing Cases, Lead &c. ...	2·2596	3,501 60
Tea House Sundries and Upkeep of Machinery	·2566	397 70
Transport to Colombo	1·3723	2,126 51
Shipping	·5342	827 87
154,964 lb. Tea @	28·2802	43,824 16

RAINFALL 1890.

	Jan.	Feb.	March	April	May	June
Inches ...	8·13	8·32	1·34	14·87	3·48	11·05
No. of days ...	13	14	8	21	10	19

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Inches ...	10·36	6·27	9·00	7·26	11·90	9·62	101·60
No. of days	22	20	21	22	24	15	209

DAMBOOLAGALLA ESTATE.

Statement of made Tea secured and yield in lb. per per acre and cost per lb. for year ending 31st December 1890:—

Field No.	1	1A	2	3	4	5	6	7	8	9	Total from old Tea and 20 acres of young tea.
Age of Tea......	6 to 7	6 to 7 and 2½ to 3½	5 to 6 and 2½ to 3½	6 to 7	5 to 6	5 to 6	5 to 6 and 6 to 7	5½ to 6½	5½ to 6½	5½ to 6½	
Acres..........	4	20	35	12	33	40	21	15	30	40	250
Made Tea in lb.	3,613	8,131	12,731	5,180	18,094	28,384	8,434	7,781	8,798	25,582	126,732
		P P	P P	M	M	M	P P	M	P	P	
lb. per acre....	903·25	406·55	363·74	431·75	548·33	709·60	401·62	518·73	293·26	639·55	506·93
	N P M			N P	N P	N P	P M	N P			

YOUNG TEA.

Field No.	10	11	12	13	14	Total from young Tea	Grand Total	From original toppings
Nature of land when planted in Tea	23 years in Coffee and Grass	30 to 40 years in Coffee and Grass	44 years in Coffee	44 years in Coffee	22 years in Coffee			
Age of Tea..............	3 to 4	3 to 10	3½ to 4½	3½ to 4½	2 to 3			
Acres in Tea..............	14	10	32	52	25	133	383	
Made Tea in lb..............	6,601	4,455	6,394	7,734	2,565	27,749	154,481	483 = 154,964 total lb. despatched
	P	P	P	P	P			
lb. per acre..............	471·50	445·50	199·81	148·73	102·60	208·64	403·35	average yield from the whole area plucked
		M						

NOTE.—N. P. not pruned within the year. P. pruned within the year. P. P. Part pruned within the year M. manured within the year. P. M. part manured. Over the whole pruned area the prunings were buried. Fields 1, 3 and 7, part of 1*a* and part of 6 were pruned late in December 1889, the pruning therefore chiefly affected the yield in this year. Manure.—Allowing 6 weeks after application for the manure to tell I find the increase in yield over the comparative field is 195 lb. per acre the first year and 100 lb. per acre the second. In the second experiment the increase was 224 lb. per acre the first year.

Having manured the comparative unmanured field in October 1890. I shall not be able to state the increaso in the second year in this instance.

The comparison with previous yoars is as follows:—

Field No.	1	1A	2	3	4
	PB	PB	PP	P	P
1889: lb. per acre	...865P	682P	313PB	337PB	320PB
	P		PP		NP
1888 do	...342PB in 4 acres		222	167P	274
1887 do	...267P		96P	130P	127P

Field No.	5	6	7	8	9	Total.
	P	P	PM		NP	
1889 lb. per acre	...437PB	344PB	400PB	299NP	512M	400 lb.
	NP		P		P	
1888 do	...348 M	188PP	203PB	143P	248PB	245 lb.
1887	...117 P	135P	140P	112P	106P	125 lb.

RAINFALL.

	Jan.	Feb.	March.	April.
1887...inches ...	7·08	10·35	3·29	12·56.
No. of days on which rain fell	15	10	5	20
1888...inches ...	0·23	0·25	2·31	5·05
No. of days ...	5	2	12	13
1889...inches ...	7·21	0·82	5·43	7·68
No. of days ...	13	2	11	25

	May.	June.	July.	August.
1887... inches	3·92	8·54	4·88	5·92
No. of days on which rain fell	15	28	17	15
1888 .. inches	5·61	17·13	0·79	4·21
No. of days ...	16	27	9	17
1889.. inches	12·01	4.23	12·81	6·87
No. of days ...	20	23	21	15

	Sept.	Oct.	Nov.	Dec.	Total.
1887... inches	3·84	17 72	15·75	31·52	128·37
No of days on which rain fell	15	23	21	28	212
1888... inches	6·91	13 37	10·44	21·95	88 31
No of days ...	16	21	20	23	181
1889...inches.	17·20	7·74	11·65	6 08	99 73
No. of days ...	26	14	19	14	203

In this connection, we have to ask planters fi ing the *Tropical Agriculturist* to correct an error with their pen, through a figure getting transposed on the first page of the *Tropical Agriculturist* in April 1890,—under cost per lb. Bungalows there is given ·712 cent, instead of ·172.

ANOTHER VINE DISEASE (GLŒOSPORIUM PESTIFERUM, C. & M.)—We have recently received from Brisbane some Vine shoots aud Grapes suffering under the infliction of a new Vine disease, which, if it spreads, is likely to be of a very destructive character. The shoots, petioles, aud peduncles present a shrivelled and miserable appearance, sprinkled, in some places densely, with small hemispherical knobs, about the size of a good-sized pin's head, and of a rosy-pink colour. Subsequent examination proved that these knobs were a mass of hyaline fungus spores, which had oozed out of orifices in the cuticle, and hardened by exposure to the air into that form. The cells beneath the cuticle are without any distinct conceptacle or perithocium, and the spores are produced upon short delicate sporophores rising from the cushion-like base of the cells. The spores, or conidia, are cylindrical, straight, and rounded at the ends, from 14 to 15 micromillemetres long and 3 to 4 broad, hyaline and colourless, with rather granular contents. When mature, they issue in a sort of gelatinous mass through orifices broken in the cuticle, and soon harden into the pin-head knobs, which remind one strongly of some of the small forms of Tubercularia, so common in this country. On the application of moisture, the spore-masses dissolve, and the spores are carried away freely wherever the water trickles. In some respects this fungus resembles another of the same genus (Glœosporium ampelophagum), common on Vines in Europe and the United States; but it differs in the colour of the exuded spore-masses, and in the dimensions of the spores, which are double the length, and broader than in the European species; besides which, we have no knowledge that the mass of spores in Glœosporium ampelophagum oozo out and form such Tubercularia-like masses. The diseased fruit is stunted, shrivelled, and exhibit a few of the spore-pustules scattered over them. It is an unenviable addition to the fungi of Australia.—M. C. COOKE.—*Gardeners' Chronicle.*

NATIVE INVENTIONS.—Mysore seems to be ahead in inventions and manufactures. A goldsmith of the Rampore village is said to have invented a plough that is light and durable and does double the work of an ordinary plough. Another man Rachappa, a resident of Chickaballapur, is reported to be manufacturing sugarcane mills on the English model which are being used in the Province by the ryots.—*Indian Engineer.*

"COCONUTS AND TEA."—We learn from an experienced tea as woll as coffee planter that "coconuts and tea" cultivation conjoined is becoming a favourite style of lowcountry plantation with several old hands. In some districts of the Western Province, both products are cultivated together, and we know of one plantation at least in Henaratgoda district, where tea is cropping exceedingly well and coconuts flourishing under this arrangement. In some parts of the country between Hanwella and Moratuwa the same style of cultivation is likely to be freely followed.

ARTESIAN WELLS AND IRRIGATION.—On leaving Colombo Mr. MacBride made his way to Tutioorin and thence to some of the large S. I. Irrigation Works, such as the Godavery Irrigation Works, which he inspected; he also examined and made inquiries concerning a number of artesian wells; while, later on, in the cold districts he was enabled to see borings carried on with the very latest appliances, which are said to be of the most perfect character. Of course, Mr. Macbride will have now to inquire into the general conditions of the Northern Province and we suppose he will pay a visit to Jaffna at an early date to see if such wells are practicablo thero. If he finds that they are, the insight that he obtained into the boring for coal at the Raueguuge and other mines will prove of service.—*Cor.*

"COCAINE IN DENTISTRY" is the name of a paper read at the 5th annual meeting of the German Association of American dentists by Dr. Blersch, Mannheim, a copy of which is sent to us by Messrs. C. F. Boehringer & Söhne, Waldhof near Mannheim. It runs as follows:—

Employed with proper knowledge and care in minimal doses of 0.190 to 0.385 grain, cocaine is unquestionably one of the safest of drugs, and has the further advantage of being so cheap, that we can give the poorest patients the benefit of it, since even if we receive no payment at all, 0.385 grain of cocaine costs only about a halfpenny. The favourable opinion of the Prague professors concerning Boehringer's Hydrochlorate of Cocaine I cau fully confirm.

IS ADULTERATION UNIVERSAL?—Speaking from an experiences of fifteen or twenty years, one medical man, at any rate, is able to say that he has not found his fellow-men of the business class half so black as they have been painted. Wines, which are so commonly ordered for sick persons, are seldom or never the poisons they are said to be, unless they are purchased at poison prices. The poor, who cannot afford to pay for good wines and spirits, should leave such things entirely alone if they cannot procure them from charitable friends. An old-established wine merchant admitted to the writor quite recently that poisonous wines and spirits arc undoubtedly manufactured; but then they are manufactured because there is a demand for thom on the part of people who cannot afford to pay for *bona fide* wines and spirits. Those persons who can pay for genuine articles are just as sure of getting them honest and good as they are of getting honest and capable medical practice when they can offer reasonable fees for it. Exactly the same may be said of teas, coffees, cocoas, beef, juices, infants' and invalids' foods, and their makers. All these things can be, and are obtained of the highest order of excellence by people who are able and willing to pay for them according to their market value.—*Hospital.*

INDIARUBBER.

London, Jan. 16.

Unfortunately my knowledge of what has been accomplished in Ceylon with respect to the growth of indiarubber plants is too restricted to enable me to judge whether you might be either prejudicially or beneficially affected by news reaching us from America as to a syndicate composed both of Americans and Englishmen having been formed with the object of buying up all the indiarubber in the world. This syndicate is said to have obtained control over fully half of the entire production of Pará rubber and that it expects to get the entire monopoly. It is intended to extend its operation, not only throughout America, but also throughout Great Britain and the European continent; and if the syndicate should prove successful, the price of indiarubber is sure to go up largely and the cultivation of the plant on Ceylon estates may be thereby much stimulated. As written above, however, it is not certain in my mind, whether the cultivation of the juice-yielding plant has been persevered with in Ceylon, or whether it has not been altogether abandoned.

The Ceylon Pioneer in Tea.

Mr. Leake tells me that he has received instructions from the Ceylon Taylor Testimonial Committee to purchase a silver tea service for presentation to that gentleman, but that the amount of money at his disposition for that purpose is so large that he is completely puzzled how to act. Altogether, the subscriptions out in Ceylon and at home to this fund amount to about £240. We hardly think Mr. Taylor would care to have silver to that amount, and an exceedingly handsome service, salver and everything complete, could probably be purchased for 90 to 100 guineas. So Mr. Leake is, as you will see, suffering from an *embarras de richesse*, and the local Committee here is somewhat puzzled as to how to proceed for the best. I told Mr. Leake it scarcely seemed to me to be advisable to put Mr. Taylor to the risk of keeping too costly an amount of silver in an upcountry bungalow; but he replied that he himself had been married thirty years, had had an entire service of silver in use throughout his residence in Ceylon, and that up to date he had only lost of it a single spoon! All that can be said as to this, in my opinion, is that Mr. Leake has been an exceptionally lucky man.

Mana Grass and Paper.

Discussing with the gentleman last mentioned the probability of Messrs. Curtis & Harvey becoming large purchasers of mana grass in Ceylon for charcoal burning purposes, he mentioned to me that he thought it would be most uneconomical to bring the grass home for burning, and that if the charcoal to be obtained by that operation should prove to be of value, we might depend upon seeing works specially erected in Ceylon for producing it locally. He did not think Messrs. Curtis & Harvoy would be alone in appreciating the value of the charcoal if it should prove to be of a very superior quality. There is, Mr. Leake said, a very great and very unsatisfactorily supplied demand for exceptionally fine charcoal for making the filaments for electric lamps. The provision of these filaments is already a very large business, and one that is sure to receive very great extension. If, as seems to be anticipated by experts,—and I believe Dr. Evans is the authority for this anticipation,—the result to burning mana grass is likely to supply this demand, there will be ample inducement for the establishment of a charcoal factory in Ceylon. Very special furnaces must, however, be required for burning such a light and easily-consumed material as this grass. Any excess of draught over that absolutely necessary for the most gradual combustion would flash it away and no charcoal would be left. I think I told you that Messrs. Curtis & Harvoy are hoping to get 2 cwt. of charcoal from the ton of the grass they have received, but at present nothing is known to me of the process of burning by which they hope to secure such a large result.

MESSRS J. H. ROBERTS AND J. HAMILTON ON CEYLON PLANTING PRODUCTS AND TEA DISTRIBUTION—MR. ROBERTS ON EXPENDITURE FOR "NEW MARKETS" FOR TEA AS A MISTAKE: ALL THE CEYLON TEA FOR MANY YEARS WANTED IN LONDON—CEYLON *vs.* CHINA.

Mr. Roberts started conversation with the observation that he regarded the expenditure now incurring by your Planters' Association upon the discovery of new markets for your tea as mistakably incurred. "The fact is," he remarked, "we want here in London *all* the tea Ceylon can send us for many years to come. I do not hesitate to say that if you were to send us eighty million pounds it would not over-tax our capacity for reception. You could not do a more unwise thing than to starve the London markets. For every pound Ceylon sends us a pound of China tea is driven from the sale. Sooner or later, if Ceylon and India send supplies adequate to our needs, China tea will find no place here. Every day sees Ceylon tea more appreciated here, and those who have once tasted it and liked it will drink no other; even now we can barely supply all that is asked for, and we want far more than we get." Mr. Hamilton at this point interposed and observed:—"Though that is all true, a larger supply must mean diminished prices. The present average all round for Ceylon tea is about 10 pence. That is not sufficient to properly remunerate the planter. To do this as it ought to be done the average must be raised to a shilling, and this is only likely to be obtained by placing buyers for foreign markets in competition. The only question to my mind is whether, if that rate were established, the present amount of demand for Ceylon tea would remain."

To this remark Mr. Roberts replied:—"Certainly it would. I feel confident that, so entirely have those who customarily drink Ceylon tea made up their minds to use no other, that even if they had to pay twopence a pound more for it they would still continue to purchase it." "That may be," was Mr. Hamilton's rejoinder, "but it is perfectly certain that it would check development of use and then the increasing production in Ceylon would have to seek other channels for disposal." Mr. Roberts, however, thought that it would be better for the future of the Ceylon tea interest to supply every possible demand for the home market than to obtain a better price by supplying foreign countries. There is undoubtedly much to be said on both sides. We can well understand Mr. Hamilton's desire that your planters should get better prices; but on the other hand we can realize the evil which would possibly follow any curtailment of the English supply and the consequent maintenance of active competition from China, which would otherwise daily slacken, until it had wholly died out. It was singular to see how different were the views taken by two partners in the same eminent firm on this particular subject. You will be better able than myself to assess at their relative values the arguements employed by both Mr. Roberts and Mr. Hamilton.—London *Cor.*

NOTES ON PRODUCE AND FINANCE.

(From the *H. and C. Mail*, Jan. 16th.)

A COSTLY TEA.—On the 13th inst. Messrs. Arthur Capel & Co. knocked down in their Ceylon sale to Messrs. Whitworth, Hillyard, and Wade, tea dealers, of Idol Lane, E. C., a small lot of extraordinary tea, at 87s per lb. It consisted of only three boxes, each containing 5 lb. of Golden Tip, from the Galleboddo estate. Every leaf was of a bright golden colour, without any brown or black ones to mar the beautiful appearance. This is the tallest price ever paid for a tea within the memory of living men. At this price, and allowing sixty cups of toa to the pound, each cup would cost 1s 6d. *The Times* of yesterday referred to this sale of tea, and the following letter from Messrs. Whitworth & Co., appears in today's issue. "Your interesting paragraph in this day's issue under the above heading would probably much surprise your readers. They will be still more surprised when we tell them, through your kindness, that we, who were the buyers at auction of the tea at £4 7s per lb., afterwards resold it at £5 10s per lb. 'A figure which has never been anything like approached in the annals of the tea trade will therefore apply to the latter price, and not to the former, as the paragraph implies. At this latter price, cost to the consumer would be about 1s 7d a cup. We trust that Indian and Ceylon tea planters will by this be encouraged to strive after quality in their productions in preference to quantity."

SPECULATION IN TEA.—"Observer" writes to the *Financial News* as follows:—As considerable speculation has recently taken place in tea, and prices in the terminal market have risen 2½d. per lb. above those ruling this time last year, it may be interesting to many of your readers, especially those engaged in the trade, to know the exact statistical position of this article. The figures are taken from the brokers' circulars of January and from the revised estimates of the Indian Tea Association:—Stock of all sorts actually in bond December 31st, 92,800,000 lbs.; arrived, but not included in stock, 1,200,000 lbs.; afloat, all sorts, 23,222,000 lbs.; stock in bond in the outports, about 6,000,000 lbs.; total, 123,222,000 lbs. Balance of Indian crop to arrive, after deducting quantity afloat, as per revised estimate of Bengal Association, 23,000,000lbs.; Ceylon tea to arrive before June 30th about 20,000,000lbs.; New make Congou to arrive before June 30th about 1,000,000lb; total, 167,222,000lbs. Delivery for six months, taken at an increase of 6,000,000lbs. per annum, 116,200,000lbs.; leaving a stock in hand on June 30th of 51,022,000lb. (The new season's China crop arrives in bulk in July.) From the above figures which are taken on the most favourable estimate, it would appear that on June 30 there will be a stock of 51,000,000lbs in the country, which appears very much more than sufficient, considering the rapid deterioration of tea by keeping, especially Indian and Ceylon tea, rendering the old season's almost unsaleable when the new tea arrives. There is one extraordinary fact in regard to tea, that for forty years there has never been an insufficiency of supply; there have been war scares, failure of crop scares, and insufficient supply scares, under which prices have been raised madly, to the ultimate detriment of all concerned, but there has always been amply sufficient tea, even when our sole source of supply was China. It seems hardly likely that, with India and Ceylon supplying nearly two-thirds of our consumption, and China able to send us as much as ever if prices are high enough, we shall suffer now from any deficiency.

THEN AND NOW.—Three score years ago Great Britain consumed thirty million pounds weight of tea, which was eight million pounds more than all the rest of the world, while in the interval the Colonials and foreigners have done their best to reach the Britisher, with the result that their aggregate consumption vastly exceeds that of Great Britain. But the people of this country now consume close upon 5lb. per head of the population against ½oz. in 1711 and 20ozs. in 1830. The reduction of duty last year caused an increased consumption to the extent of some 5,000,000 lb. while it seems that the combined exports of India and China are likely to be very considerably less than last year.

CINCHONA BARK IN HOLLAND.

AMSTERDAM, Jan. 14th.—All the analyses for the cinchona-bark sales to be held in Amsterdam Jan. 22nd have been published now. The manufacturing bark contains about 7 tons sulphate of quinine, or 3·6 per cent on the average, divided as follows:—About 23 tons contain 1·2 per cent; 52 tons, 2·3 per cent; 43 tons, 3 4 per cent; 33 tons, 4·5 per cent; 11 tons, 5·6 per cent; 8 tons, 6·7 per cent; 12 tons, 7·8 per cent. —*Chemist and Druggist.*

WHAT A CEYLON TEA ESTATE PROPRIETOR DOES WITH SOME OF HIS TEA IN THE EAST OF LONDON.

(*Communicated.*)

Perhaps your readers will be interested to hear of the undoubted destination of some of the Ceylon tea, as well as of the good work done in East London by Mr. P. R. Buchanan, sometime tea-planter in Assam and proprietor of Blackwater estate in Ceylon.

Unlike some of those noisy shallow philanthropists who, in their ignorance, aggravate in their efforts to cure, the diseases from which our old mother country is suffering, Mr. Buchanan determined to know the poor before he attempted to help them. So he and his wife settled down in East London, simply living among the people, making no fuss, bringing no nostrum, not even enjoying the slight éclat which surrounds the position of the Church of England clergyman even in the poorest parish of East London. Two things he learnt the poor needed (besides, of course, the one thing needful which no man can give his brother)—both of which he could help them to: one was places other than the public-houses where they could meet and have really good fellowship unfettered by any individual's particular fads. So he started a Club which soon became popular in the best sense. The men adopted it as their own, worked for it, cared for it, sacrificed for it. Mr. Buchanan added lectures, classes, a co-operative shoe-making establishment and a co-operative cabinet-making shop, billiard tables, &c. The second need he noticed among the poor was their want of good food, a want hundreds had noticed before him, but which he determined to remedy in a way that could not pauperize. So he started food houses—honest food, honestly cooked, honestly sold, honestly paid for. There a man can get his plate of beef for 2d, his bit of pudding for 1d, his basin of soup for 1½d. "Pay, yes certainly it pays some of us," said Mr. Buchanan, "it pays me, it pays the men, it pays the tea growers, it does not pay the publican." Anyone who buys food can buy tea, 1 lb. of good Ceylon tea at 1s 2d, good dusty at 10d, pekoe at 1s 4d —and excellent it is 'Where do you live?" asked the writer, of a dear old woman who was folding ¼-a-lb. in her checked and spotless apron. "Out Battersea way—but I always come up once a fortnight to get my tea here; it does me better than anyone else's." To Mr. Buchanan's "Teetotums" working men pay the compliment of using them. Of many philanthropic schemes it can be said that they are used by all for whom they were not intended. But the Teetotums are in this sense exceptional—the lights, the cleanliness, the abundance of the newspapers of the day, the fair weight, the hot food, the air of independence that is in the places are all understandable goods to the workman's mind,

and they come in crowds, bringing often their wives and babies; for in Mr. Buchanan's generous management there is no rule as to one portion one person. No! if a man is in low water he can have one portion or half-a-dozen plates and knives and forks if half-a-dozen mouths are to be fed from the one portion. At first but one Teetotum was opened, but its success was soon a proven fact and four others are now opened in different large thoroughfares of East London. Mr. Buchanan imports his tea direct from Ceylon, from we suppose his own fine plantation in Ambagamuwa, —so he is his own middleman and neither he nor his purchasers lose thereby. Of the value of his work there can be no doubt, for it is a want of good food that too often is the parent of the Englishman's craving for drink. To raise the standard of comfort among the working classes is in itself a good, and one with far-reaching results.

Each Teetotum has its rooms for recreation—billiard and bagatelle tables, draughts, chess, backgammon, &c. Mr. Buchanan has taken care that those who come to play should have the chance of remaining to pray; for in each room there are papers and advertisements about "the Club" into which the men can be drafted or where they can have all those kindly advantages of human fellowship without which in a crowded city it is hard for a man to believe in a Divine and Beneficent Power.

MR. SCHWANN, M. P., ON TECHNICAL EDUCATION.

Pursuant to announcement the meeting arranged by Mr. George Wall for the purpose of hearing Mr. Schwann, M.P., on technical education came off today (Feb. 5th) at 11 a.m. at the Fort Library, under the Chairmanship of Hon. S. Grenier (Attorney-General). There were also present:—Hons. W. W. Mitchell and P. Ramanathan, Messrs. J. B. Cull, George Wall, J. H. Marsh, H. W. Green, H. H. Capper, F. Beven, and C. M. Fernando, Miss Frédoux, Rev. W. J. G. Bestall, Messrs. J. L. K. Van Dort, J. W. C. de Soysa, and J. Allport, and a goodly gathering of schoolboys from the Royal College.

Mr. George Wall briefly introduced Mr. Schwann to the meeting. He said that Mr. Schwann was associated with one of the largest technical institutions in the world, and he had no doubt that they would all be glad to hear him on the subject of technical education.

Mr. Schwann prefaced his remarks by saying that he regretted that amongst the many attractions of the island, there was one defect in the very rapid changes of temperature which produced a great effect on one who was not acclimatized. The effect of the temperature had produced a huskiness in his throat, which prevented him from speaking out as forcibly as he would wish in advocating the cause of technical education. He thought it was unnecessary to enter into any lengthy arguments on the subject, or to speak of the advantages of technical instruction, because the subject was not altogether new to the inhabitants of Ceylon. Several gentlemen whom he saw at the meeting (and one in particular) had already advocated the advisability of establishing a Technical Institution. Now it seemed to him that it was advisable to form an Association for the promotion of technical instruction in Ceylon, and the success of that Association would depend on those who composed it, and to this end it was indispensable that they should have gentlemen who were conversant with the subject and who would also be a guarantee to the public that the ends would be carried out in a practical and earnest manner. For the purpose of raising subscriptions and donations they would have to appoint gentlemen of some high position in the city who would be willing to lend their co-operation to the scheme, as it was evident that it was not likely that the public would support any project which had not among its supporters men who could command the entire respect of the public at large. He believed there was a building in Colombo which might conveniently act as a centre for the Technical School. He meant the Agricultural School. He believed that education in agriculture was imparted in that school, and there was no reason why education in engineering, carpentry, &c., should not also be taught there. He was glad to find that H. E. the Governor was favourably disposed towards the scheme, and he would be only too glad to accept the patronage of such an association. It was also advisable to have a number of vice-presidents—gentlemen who, although they might not take an active part in the work, yet would be desirous to identify themselves with such an institution. But it seemed to him that the chief responsibility rested with the Executive Committee, and that body, he thought, should be specially gifted and strong in their own special subjects, and that Committee should consist of men who were willing to lend their aid towards the inauguration of the scheme and who were able to satisfy the public that the objects would be carried out in a practical manner. Finally, if they got the cooperation of one or two business men, and especially a few gentlemen who were connected with the Spinning and Weaving Mills or any other industry in the town, they could have no doubts as to the success of the scheme. They also required the services of a Director, and an able man who would command the respect of the public. Mr. Mitchell, he heard, was proceeding to Europe by an early mail, and he was certain that he would select a useful man to take up the duties of that important post. He was glad to find that Mr. Green had succeeded in getting them a grant of R5,000 per annum, which would go towards the salary of the Director. For his own part, he would be happy to render any assistance to Mr. Mitchell when he was away in England, and he had no doubt that Mr. J. E. Reynolds (the Secretary of the Manchester Technical Institute), Sir Philip Magnus, Sir Henry Roscoe, and a few other gentlemen who were interested in the work that was carried on in the Technical Institute at Manchester, would cheerfully lend their assistance to Mr. Mitchell. He thought that some objections might be started against the establishment of a Technical School, but he pointed out the successful character of the industry as carried on in Manchester where an immense number of trades was carried on. There was one department where a number of people were turning out special objects of domestic utility, while others turned out small screws, which were sold to those manufacturers whose attention was solely devoted to the construction of engines, and if the industry met with such encouragement in London, where competition was much greater there than it was here, the Technical Institution was bound to flourish in Ceylon. Without monopolizing the time of the meeting, he begged therefore to move a resolution which was unanimously carried, viz. "That the following gentlemen with power to add to their number do form themselves into an Association for the promotion of technical education with the object of establishing a technical school in Colombo and for the encouragement of any movement likely to assist the application of art and science to the industries of Ceylon:—Hons. S. Grenier, A. R. Dawson, W. W. Mitchell, J. J. Grinlinton, A. de A. Seneviratne, P. Ramanathan, Messrs. George Wall, John Ferguson, H. W. Green, J. B. Cull, J. W. C. De Soyza, H. H. Capper, F. Beven, Edmund Walker, S. Rajapakse, Drs. Rockwood and H. M. Fernando." In explanation of the latter part of his resolution, viz. that the Technical school do also encourage other movements of a similar character, Mr. Schwann said that it was possible that other institutions would like to affiliate themselves with them and therefore it was desirable that a Technical Association in Colombo should have a wide basis. Apart from that fact a great number of the inhabitants of Colombo would like to co-operate with them. As regarded funds, he said that the institution to a large extent depended on the large number of *small* subscriptions

He would be more thankful if he received small subscriptions yearly, as large annual subsoriptions after a year or two died out. By this he did not of course mean to discourago those who were desirous to pay large sums annually. They conld get funds through the students' fees and other sources. In conclusion he hoped erelong to receive some information that the school was established, and he promised to render every assistance to them in the matter of getting for them anything they requirod from the manufacturers in London in order to carry on their work here. (Applause.)

Mr. GEORGE WALL in supporting the motion, said that the importance of the subject had been recognised for a long time, especially by Mr. Green, during the time when he was Director of Public Instruction. It had been said that hitherto the scheme had not assumed any definite form. That was true, but he thought it would have been a mistake to put before the publio anything of a particular definito nature until the views of those interested had bsen ascertained. He thought that after the pertinent, practical observations which had been made by Mr. Schwann they had sufficiently defined the subject and not too much defined, but left in a condition, so that those who had the interests of the scheme at heart could with sufficient freedom of action do what in their judgment seemod wise and good. He had no doubt that the gentlemen who composed the Committee would fulfil most of the conditions that were primarily necessary for the carrying out of the objects they bad iu view. In their own community there were men who were acquainted with special industries so intimately that their advice would be of paramount value, and he had no doubt but that that advice would be given by them with all cheerfulness. He believed that by the excellent management and thonghtful attention which had been given to the subject by the late Director they were likely to have the use of the necessary building without the formidable cost of having to erect them. He thonght that they would have also to obtain appliances to furnish the workshops, and he had no doubt that those who were deeply interested in the project would liberally subscribe towards the purchase of the nccessary materials. He believed firmly that when the objects required wero more clearly made known to those men, that they would come forward with a liborality which would enable the Committee to go to the Government and say : " We were able to help ourselves to this cxteut, we pray that you would give us somo help;" and he believed that such help would not be wanting. He thought therefore that the resolution proposed by Mr. Schwann would go a long way towards supplying tho long-felt want. (Applause.)

The resolution was then put to the meeting by the Chairman and carried unanimously.

Hon. W. W. MITCHELL followed and said that it was not necessary to dilate at length upon the advantages of technical education to be gained by those for whom it was intended. Tho subject had been occupying a good deal of attention, and the classcs for which it was more especially intended were tbe sons of the better classes for whom it was difficult to adopt the profession of lawyers or advocates. It was desirable that men should be trainod to become foremen in some of the large establishments which were being oreated in Ceylon, and that others who might not occupy that position should bo trained to somo other work. One thing which had struck him iu connection with a technical school was that practical education should go hand-in-hand with theoretical education. It was cheering to learn that Government had promised to co-operate with them in the matter of granting a sum of R5,000 por annum, which would go towards the salary of the Superintendent, and it was very necessary that an able mau should bo selected for the post for the success of tho scheme depouded on him. They would of course, require a gallery of illustrations, illustrating the different industries, and they could carry on in the Agricultural School itsolf such work as carriago-buildiug, mechanical work, engineering, tolographing, &c., and those boys who wished to enter upon commercial pursuits could get a knowledge of all these subjects. As far as the revenue was concerned, they could make np that from the students' fees and Government grant. He thought that a good deal of progress had been made towards the inauguration of the scheme by two gentlemen who were in the room, and therefore moved the following resolution ;—"That the thanks of the meeting be given to Mr. Green, late Director of Public Instruction, for his eminent services on this behalf and to Mr. Cull for his zealous pursuance of the line of policy initiated by his predecessor for the furtherance of a Technical Institution for Ceylon."

Mr. RAMANATHAN in seconding the motion said that the subject had been occupying the attention of the community for many years. It formed the subject of an important debate so far back as 1875 in the Legislative Council, but the gentleman who led the debate, Sir Muttu Coomara Swamy was no longer alive. He believed Mr. Mitchell was also then a member of Council, and he could bear testimony to the fact that he had been greatly interested in the establishment of a Technical Institute for Ceylon. (Applanse).

Mr. GREEN said that on bis own behalf and on behalf of Mr. Cull he felt very grateful to them for the compliment accorded to him. He had been working away at the question like a mole for years with a view towards forming a Technical Institute in Ceylon, and like a mole had thrown up a lot of earth, but had only got one step in advance. He thought that Government had done pretty well in giving a grant of R5,000 per annum for the salary of a Superintendent, and there was also the implied promise held out that tbe Agricultural School might be ntilized as a sort of a general Technical and Agricultnral School. There was sufficient accommodation for the purpose in the Agricultural School. One wing of the School was left open when the school was being built aud he thought that that could be utilized for the purpose and they would have shortly one good central Technical Institute, combining a technical as well as a good general education. They had a capital Professor in the school in Mr. Drieberg, aud if Messrs. Schwann and Mitchell sent out a proper man to deal with other branches of the technical side, these two gentlemen would be able to give lectures to the boys of both the Agricultural and Technical sides who wished to acquire a good knowledge of a general education. He had always intended the Technical School to be one side of the School of Agriculture. There were in the country what we might call too many gentlemen and too many coolies and it was very desirable that they should make an effort to combine the two aud to get gentlemen not to think it below them to work technically and with their hands, and not to call it "cooly work." They were all grateful to Mr. Schwann for his efforts in the matter, but he thought that they should hold tho reins tightly aud not go too fast. Some of the speakers suggested that they should have a "Gallery of Illustration," and second-rate Workshops, but he thought it would be better to establish classes and march the boys round to the Government Factory, Messrs. John Walker & Co.'s workshops, the Cotton Spinning and Weaving Mills, so that they might get some practical training in those establishments, instead of having to put up workshops in the school itself, at an expensive figure. He referred to the Industrial School at Tellippalai at Jaffna, where the boys worked at all manner of things from excellent wire-mattresses down to turning out photographs and this he thought should sorve as an encouragement to them as showing what could bc done even in a mere Industrial school. Ho was glad that Mr. Sohwann had mentioned the question of fees, for when he was Director he was severely anathematized by by Managers of Schools for charging fces and he hoped that the Executive Committee would attend to that matter aud make it a source of revenue. (Applause.)

Mr. CULL also thanked the meeting for the compliment paid to him and humorously remarked that they once had a peripatetic school of botany, and now it had been proposed to have a peripatetic technical school. (Applause).

The CHAIRMAN said that they all felt grateful to Mr. Schwann for the conference they had held that day. It was a rare event to find a member of Parliament staying here on his travels and taking an interest in what was going on around; and not only were they thankful to him for what he had done already, but for the prospect which he had held out to them. He endorsed what Mr. Wall said, and that was that if they went to Government and said "Now we are able to help ourselves to such an extent, would you supplement what we have by giving extra?" he was sure that the Government would come to their rescue. He impressed on the members that it was of paramount importance to them that they should put their shoulders to the wheel and work with might and main, both by attending meetings and collecting subscriptions from their friends. He concluded by moving a vote of thanks to Mr. Schwann for his efforts in promoting the formation of a Technical School.

Mr. BEVEN in seconding the compliment, said that Mr. Green had rendered very eminent services in connection with the Agricultural School, and it was not his fault that he had been unable to establish a Technical Institute although he had striven assiduously to accomplish that object, but Mr. Schwann had very opportunely come and in the formation of that association they had the nucleus of something which would be very beneficial to the country. As the Chairman had remarked, Mr. Schwann was entitled to a hearty vote of thanks, and he had much pleasure in seconding it.

Mr. SCHWANN acknowledged the vote of thanks and pointed out with regard to Mr. Green's proposal to march the boys out to private establishments that the Managers of these would not like the idea, as they ran the risk of their trade secrets being exposed. Apart from that the students might sometimes saw off a finger or smash their hand on an anvil, and it was better that they should do so on property of their own than on that belonging to someone else. (Laughter.) He thought that it was necessary to have corresponding members, and he would be glad to be made one of them and he had no doubt that Sir Henry Roscoe and the other gentlemen he had named would render them every assistance. In conclusion it gave him much pleasure to propose a vote of thanks to the Chairman. It was a great advantage to have a gentleman of the Chairman's position, for it was a guarantee that the movement was of a serious and practical character. (Applause.)

Before the meeting broke up, Mr. Green suggested the appointment of two Secretaries. He therefore moved that Mr. Edmund Walker and Dr. H. M. Fernando be appointed Secretaries. The motion was unanimously carried.

We venture to append here a letter which we had written to Mr. Mitchell as our apology, for not being able to attend the meeting, but which the hurry of mailday delayed in delivery :

Mount Lavinia, Feb. 4th.

* * * *,—The pressure of work on a day like tomorrow forbids my leaving the desk within a few hours of the mail closing, or I should have been very glad, at your invitation, to make one of Mr. Schwann's auditors and to hear other gentlemen talk over with him what should be done further to extend Technical Education in Ceylon. While I am sure the result will be a very interesting meeting and that Mr. Schwann will be able to give valuable information, I do trust all concerned will be on their guard against considering experience gained in a city of the wealth and intelligence of Manchester or any other large English town as applicable to a poor oriental tropical town like Colombo or such a colony as Ceylon. We published a very sensible letter a few weeks ago from a gentleman who knows what he was writing about, a copy of which I enclose for your guidance; for I see you are credited with the intention of selecting in England in conjunction with Mr. Schwann, a fit Superintendent for the Colombo Technical Institute. But are we ready for the services of such a Superintendent as you would be likely to select and send out from England? Should it not first be clearly understood what the local want is which such an official is to supply. As Messrs. Green and Cull can tell us, a good deal of technical instruction of a very practical though unassuming character has already been done in connection with the Agricultural and Normal Schools and seeing in how many directions scientific and practical training has become available to lads in Colombo, from competent instructors, it is a question whether a very much progress could not be made, perhaps after a modest but safe fashion, with the material at our hands. Instructors for classes in Chemistry, Botany, Mechanics, Physics, in Civil and Practical Engineering and in a variety of local industries are, I believe, available, and the selection of a Superintendent *pro tem* locally might well be left to the Director of Public Instruction, until it is seen in which direction special experience is chiefly required. It may even be a question whether India (Bombay or Madras) would not supply us with the lead and experience most suited to the requirements of Ceylon better than England. In both these Presidency towns, much has been done in technical instruction.

You, as well as I, have seen so may failures from the rash introduction of "fresh blood" in the shape of "specialists" from the old country, intended to work wonders in new and old official Departments, that I am sure you will agree in the need of acting with full consideration and forethought in the present case.

We should also never forget what has already been done for the youth of the country not simply through local Schools and Colleges,—there are now, available, I believe, science, drawing, painting and music classes,—but also, after an even more practical way by the Government Factory, the Railway Engineering Shops, the large Establishment of the Colombo Iron Works Company and the many Iron and Engineering Workshops in Colombo, Kandy and throughout the planting districts, also by the various Printing Offices and last not least, what may be expected from the Cotton Spinning and Weaving Mills.

Wishing all success to the further development of technical and practical instruction in our midst, &c.,

J. FERGUSON.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &C., EDITOR OF "SCIENCE GOSSIP."

Some twelve months ago I recommended people who suffered from muscular rheumatism to get well stung by a very excited beesnest—British bees, of course. Afterwards, thinking tenderly both of bees and rheumatic patients, and knowing that the former, if not the latter, lost their lives by the job, I suggested subcutaneous injection of formic acid, which is the real, but not only, cause of irritation of a bee's sting. I have myself tried it on a few friends, not being rheumatic myself. They say it did them good. Most valetudinarians say the same of their last new physic. Anyhow, it has been discovered that a person "stung" by our British bees is "protected" thereby for at least six months—after the law and rule of vaccination. Persons suffering from rheumatism are advised that they must be stung in proportion to the degree of their malady.

A French botanist has recently shown that flowers possess energetic respiratory and transpiratory functions superior generally to those of the leaves of the same plant. The assimilation is generally feeble, and much diminished by the intense respiration. The volumetric proportion of carbon dioxide (the old-fashioned carbonic acid) emitted to oxygen absorbed is always small, and less than unity.

It is now contended that the liquid secreted by the pitcher plant (nepenthes) is not in itself peptic or digestive. A French chemist and botanist, Professor Dubois, has recently demonstrated that the so-called digestive process is due to bacteria in the fluid. The,

bacteria have to account for everything nowadays. I am surprised that General Booth has not made use of them in his new book.—*Australasian.*

CLEANING MACHINERY.—The simplest and most efficacious method of thoroughly cleaning the various parts of machinery that have become gummed and dirty by the use of fat oils for lubricating purposes, is by using a strong soda lye. For each 1,000 parts by weight of water take about 10 or 15 parts by weight of caustic soda or 100 parts ordinary soda. Let the solution boil and enter the parts to be cleaned; either boil them in this lye or let them steep in it for some time. All the dirt and oil resin is completely dissolved thereby, and it remains only to rinse and dry the parts. The action of the lye is such that it enters into combination with the oil and forms soap, which is readily soluble in water. In order to prevent the hardening of the lubricant on the machinery parts, it is only necessary to add about one-third kerosene. An occasional lubricating with kerosene alone is to be recommended.—*American Engineer.*

HOW TO MAKE TEA.

WILL ONE POUND OF TEA MAKE 300 CUPS?

How to Make a Cup of Tea, is a matter the majority of housewives have yet to learn. In the *Public Ledger*, Philadelphia, we find the following:—

MR. EDITOR:—My attention has been called to a query, in a recent issue of the *Ledger*, as to the accuracy of my statement that one pound of tea would make 300 cups. While the question or individual opinion upon this point may be of but little interest to the public, the actual facts in relation to an article so extensively used may be of value.

My calculation was based upon the following facts: Tea testers ordinarily use a silver 5-cent piece for weighing the exact quantity of tea required for a cup. As there are about twenty-five 5-cent pieces to an ounce, and as there are sixteen ounces to a pound, it follows, that one pound of tea will actually make 400 cups, according to the standard of strength ordinarily required by professional testers. The cups used for this purpose contain, however, one-fourth less than the average domestic tea cups. It will, therefore, be seen that after making due allowance for the difference in the size of the cups, the number will be very close to 300.

The surprise with which this statement is generally received demonstrates how little the economical features of this delicious and wholesome beverage, when rightly made, are known. If the following directions were carefully observed, and a good quality of tea used, no doubt this economical beverage would be much more generally appreciated.

Directions.—Put the tea leaves into an earthen or agate ware pot (never use metal), and stand on back of stove until the leaves get thoroughly warmed. Then pour on water that has been freshly boiled, and which is boiling thoroughly at the time. Let stand on back of stove for about ten minutes, where it will keep hot, but not boil.

At the expiration of that time the tea will be perfect and if you desire it to remain so, pour off the liquor into another vessel, so as to separate it from the leaves. The common allowance is one teaspoonful to each cup, but as some prefer more strength than others, it is evident that each tea-maker must decide for herself whether the teaspoon shall be "slack," "even" or "heaping."

In serving, have the cups and cream warm, and pour the cream into the cup before putting in the tea.

FINLEY ACKER.

—*American Grocer.*

ORANGES.—The *Tavares Herald* says that a citizen of Apopka City, Fla., has started a budded orange tree to be sent to the World's Fair, which contains eighty-five buds, bearing, representing twenty-six different varieties of the citrus family—oranges, lemons, limes, grape fruits, shaddock, etc.—*American Grocer*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Jan. 15th.

CINCHONA.—The first cinchona auctions of the year were held on January 13th. The quantity of bark offered was hardly so large as might have been expected from the fact that there has been no public sale here since December 16th, and that in the meanwhile the arrivals have been very considerable. The total quantity catalogued consisted of:—

	Packages		Packages	
Ceylon cinchona	1,968	of which	1,597	were sold
East Indian cinchona..	1,147	do	846	do
Java cinchona	36	do	36	do
S. American cinchona...	509	do	410	do
West Coast African cinchona	80	do	79	do
Total	3,740	do	2,968	do

A dull tone prevailed throughout the auctions, and several parcels were bought in, owing to impossibility of placing them at the limits for which they were held. The unit, though hardly as high as at the preceding sales, is scarcely quotably lower, and may be placed at about 1½d per lb. The assortment of the bark offered was somewhat below the average, although a few lots of fine Succirubra barks were shown, which realised high prices. The following are the approximate quantities purchased by the principal buyers:—

	Lbs.
Agents for the Mannheim and Amsterdam works	218,239
Agents for the Brunswick works	131,383
Agents for the American and Italian works	85,938
Agents for the Frankfort o/M. and Stuttgart works	57,410
Agents for the Auerbach factory	37,550
Messrs. Howards & Sons	34,813
Mr. Thomas Whiffen	3,050
Sundry druggists and spectators	75,337
Total quantity of bark sold ...	643,720
Bought in or withdrawn	142,886
Total quantity offered ...	786,606

A fairly large quantity of bark was secured by the firm of brokers who are reputed to act on behalf of a syndicate of speculators, and who have appeared as purchasers at the auctions of late.

JAVA CINCHONA.—Yellow branch chips 4½d to 5d; fine ground ditto 7½d; fair root 7d per lb.

SOUTH AMERICAN CINCHONA.—The only variety offered of this class of bark consisted of cultivated Bolivian Calisaya, of which about 23,000 lb were sold at from 4½d to 7d for sound broken small and irregular to good bright medium quill. A parcel of fine quality was bought in at 10½d per lb.

WEST COAST AFRICAN CINCHONA.—A parcel comprising 11,228 lb of this bark, recently imported via Lisbon, was included in the auctions. It consisted of fair bright Succirubra quill, medium size, and nearly the whole of it sold at 4½d for the best, and 3d per lb for the poorest lots. Chips bought 4d per lb. All the bark was in a more or less damaged condition.

ESSENTIAL OILS.—The market is generally quiet, Citronella being held for ⅜d per oz on the spot, while the c.i.f. quotation from Ceylon is 10½d per lb for tins, but we do not hear of any business thereat. Lemongrass 1¾d per oz on the spot, and 1 7-16ths d per oz c.i.f.

QUININE.—Business has been dull this week, and, so far as we can hear, it has been restricted to a total of about 15,000 oz on the spot (all second-hand)—viz. B & S and Auerbach at 12d per oz, and later on a small parcel of Brunswick at 12½d per oz. The total imports of quinine into the United States during the year 1890 are returned at 3,384,300 oz. In 1889 they were 2,431,441 oz.

"KEW BULLETIN."—As an appendix to the *Kew Bulletin* for 1890, an index to the Kew Reports for 1862—1882 has been published, which will be of great service to those interested in economic botany. The *Bulletin*, it may be added, is intended to furnish in a detailed and timely form the information formerly included in the annual reports. Serviceable as the *Bulletin* is, it does not, however, take the place which the Report used to do, and many interested in the progress of botany and scientific horticulture as illustrated in the gardens, herbarium, library, and museum, would gladly welcome an annual report as well as a monthly bulletin.—*Gardeners' Chronicle.*

TEA COMSUMPTION IN BRITAIN: RAPID ADVANCE IN THE USE OF CEYLON KINDS.

The reduction of the duty on tea imported into the United Kingdom from 6d to 4d per lb. seems really and materially to have operated in increasing consumption. The figures for 1887 were 183,561,000 lb. Then came an increase in 1888 to 185,416,000. In 1889 the increase was scarcely appreciable, the figure being 185,600,000. In 1890, however, there was a rise to 194,008,000,—an increase of nearly 8½ millions of pounds. The increase was entirely in Indian and Ceylon kinds, there being a decrease in China of 3,570,000. The increase of 8½ millions, being entirely in the stronger Indian and Ceylon kinds, may be taken as the equivalent of at least 12 millions of lb. had the standard been China. The increase in the consumption of the Indian kinds was from 96,000,000 in 1889 to 101,961,000 in 1890, or not far short of 6 millions, an increase of nearly 6¼ per cent. The increase in Ceylon teas exceeded 6 millions, the rise being from 28,500,000 in 1889 to 34,516,000 in 1890, or an increase of not less than 21½ per cent. So that, comparing the imports of both kinds, Ceylon has been taken in three fold proportion. This fact certainly confirms Mr. Roberts' strongly expressed opinion in favour of the popularity of our Ceylon teas, and this and the present good prices ought to reassure Ceylon tea planters. In the month of December the deliveries of Indian tea were 8,745,000, while the imports were 14,354,000. In the case of Ceylon, on the other hand, the deliveries in the last month of the year came close up to the quantity imported, thus:—Imported in Dec. 2,888,000 lb; delivered 2,772,000. For the last half of 1870 the deliveries of Ceylon teas actually exceeded the quantity imported, thus:—

Imported	23,906,000 lb.
Delivered	24,874,000 „
Excess delivered	968,000 „

In the case of Indian teas we get for the six months:—

Imports	67,924,000 lb.
Deliveries	59,037,000 „
Excess of imports,	8,887,000 „

Of China the record is:—

Imported	54,669,000 lb.
Deliveries	49,919,000 „
Excess of imports	4,750,000 „

and this notwithstanding the fact that deliveries for export are still very largely China: 30,000,000 lb, at least against about 2¼ millions Indian and Ceylon, or less; the exports of these kinds for the whole of 1890 being only 2,624,000 Indian and 1,431,000 Ceylon tea.—This seems also to confirm the opinion of both Messrs. Roberts and Hamilton that our lowcountry teas should be well-suited for "export" purposes to the Continent of Europe and Russia especially. To sum up: the consumption of tea in Britain is rapidly increasing, and the increase is chiefly in Ceylon, which for a crop one-third in quantity shows increased deliveries actually in excess of those of Indian, while China and Java are both receding. There are no doubt some good China teas imported, but public taste has settled the degrees of comparison as Indian better and Ceylon best. The prospects before the Ceylon enterprise are certainly bright and encouraging.

After writing the above we read the London *Times*' remarks on the Board of Trade returns, from which we quote as follows, only remarking that if a better demand is springing up for China tea, it is probably amongst blenders:—

The increase in the imports and consumption of Indian and Ceylon teas is as steady as the downward progress of Chinese sorts. Thus the imports of Indian and Ceylon have risen from 113,000,000lb. in 1888 to 127,000,000lb. and 146,000,000lb. in 1889 and 1890 respectively, while Chinese has fallen from 105,000,000lb. to 88,000,000lb. and 74,000,000lb. The consumption of Indian and Ceylon, which in 1889 was 124,000,000lb., rose to 136,000,000 lb. last year, while that of Chinese fell from 59,000,000 lb. to 55,000,000 lb. These proportions are entirely reversed as regards the exports of tea from this country, the quantity of Indian and Ceylon being only 4,000,000lb., and that of Chinese reaching 31,493,000lb. It is reported, however, that a better demand is springing up in this country for Chinese teas.

MANURES FOR CROPS.

POTASH MANURES.—The quantity of potash in most soils greatly exceeds that of phosphoric acid. Thus while in a fertile soil there may be from ·7 to 1·5 of the former, there may be only ·3 to ·5 of the latter. The weight of an acre of arable land 9 in. deep ranges from 3,000,000 lb. to 3,500,000 lb., which gives 3,000 lb. to 3,500 lb. for every 0·1 per cent of any constituent. There will therefore be in many soils from 17,500 lb. to 36,000 lb. of potash per acre, against from 7,500 lb. to 12,500 lb. of phosphoric acid. Clay soils are richer in potash than lighter and sandier soils. This abundance of potash is in itself a reason why potassic manures are less effective than some other fertilisers which contain rarer substances. Another fact in connection with potash is that it is for the most part returned to the soil in the form of straw used for litter or food for stock, so that while phosphoric acid is constantly drained off the farm through sales of wheat, milk, and young animals, most of the potash is retained. Again, farmyard manure contains about 0·67 per cent of potash, so that in applying 15 tons of dung we are adding 2 cwt. of pure potash. If farmyard manure may be viewed as a nitrogenous manure, it may equally well be spoken of as a potassic manure. The drain of potash from land is, however, constant although slow. To a certain degree it is washed through the soil in natural drainage, and it is also removed by the sale of crops. Before the discovery of the immense beds of kainit which exist in the rock salt deposits of Stassfurt in Prussia, agricultural chemists looked forward to a time when a potash salts would be in greater damand than were likely to be supplied from existing sources. Potash was then an expensive fertiliser, but since that time and for many years past potash salts have been offered at a reduced price, and are at present quoted at £3-10s. per ton ex ship. Up to the present time the demand has been limited, and it does not occur to the majority of farmers to apply kainit. It is, however, used upon certain light soils which are naturally deficient in potash, and for potatoes, beans, and clover, on account of the large amount of this alkali which they require. A good sample of kainit contains 25 per cent of sulphate of potash associated with 30 per cent of common salt, and about the same proportion of magnesium and lime salts. The remainder is water and insoluble silicious matter. 4 cwt. of kainit, it will be observed only adds 1 cwt. of sulphate of potash to the land, and a much smaller amount of potash. An ordinary dressing of farmyard manure would therefore restore as much potash to a field as half a ton of kainit, and this being the case, it does not seem very likely that the demand for potash salts will increase. The amount of potash in soils has already been stated as from 17,000 to 36,000 lb. per acre. It is not contended that this is all available, although as it is usual only to analyse the fine portions of a soil which pass though a very small mesh, much of it must be attackable by growing roots —the salts of potash being easily soluble.

The following crops are known to absorb large quantities of potash taken from the soil:—

6 tons of potatoes with their tops take up 76 lb. of potash per acre.

30 bushels of beans with their straw take up 81 lb. of potash per acre.

30 bushels of wheat with their straw take up 28 lb. of potash per acre.

The astonishing fact is noted that after eight years removal of crops the final crop was rather larger where no potash had been applied than where 500 lb. of its salts had been annually applied. And yet it would not be wise to conclude that because no effect was produced at Rothamsted that potash salts are therefore not useful. It would be equally foolish to think because a great result should be obtained at Rothamsted we might expect the same anywhere. Each farmer must be an experimentalist for himself, and hitherto we have not seen much evidence of the use of potash salts as manure for ordinary soils, such as we have seen in case of phosphatic and nitrogenous manures. They are most likely to be effective on the lighter classes of land.

Nitrogenous Manures.—The two best known members of this group are nitrate of soda and sulphate of ammonia and most of the other nitrogenous manures are refuse materials from animal bodies or from seeds. Such are all the guanos, blood, wool, fish and flesh and cake manures. The efficacy of nitrogeneous manures appears to be due to two facts. First that nitrogen in an available form exists in very small quantities in the soil, and, secondly, that it is required in proportionately large quantities by crops. The total amount in the land may in good fields be taken in the top nine inches as 0·15 or one-tenth of the amount of potash. Nitrogen is available chiefly in the form of nitrates, and these are much more liable to wash through the soil than are potash salts. Finally, nitrogen is removed from the farm in saleable crops and in the bodies of animals in larger quantities than potash, which is largely returned both in root crops and straw to the land. There may be other reasons, but these sufficiently account for the great effect produced by nitrogenous dressings of all kinds. So rapid is their effect that it has been called "stimulating" although without sufficient reason. The crops seem to hunger for nitrogen and always present a yellow and starved appearance when it is deficient. A rank dark green appearance always accompanies a full, or over full, stock of nitrogen in the soil. It is to the grasses including the cereals, that these manures are most useful. But wherever leafy growth is desired as in the cultivation of cabbages and rape nitrogen in the form of nitrates may be applied with success. The leguminous crops, beans, peas and clover are not so much benefited by direct dressings, but they require the land to be rich in nitrates, notwithstanding. The absolute necessity of nitrates for the cereals has been amply proved. Wheat appears as if it could be grown consecutively for almost any number of years, on the same land, if only plenty of nitrates are added.

Nitrates, no doubt, if used alone, tend to exhaust the other constituents of plant food if the produce is sold off the farm. If, on the other hand, the produce is consumed at home—or if foods for stock and other manures are purchased in liberal quantities there is no fear of exhaustion. So important are they, that some times it appears as though the entire science of manuring consists in adding nitrates to the soil. The effect is, however, greatly increased if phosphates and, in some cases other mineral manures are added with the nitrates so that heavy as the crops are which may be grown with nitrate of soda, they are eclipsed by a judicious use of nitrates and mineral substances combined. In applying nitrates we prefer to use them in organic combination wherever possibe. Nitrate of soda and sulphate of ammonia are both exceedingly useful but are subject to washing through the soil by rain—the first immediately, and the second more gradually as nitrification proceeds. They act rapidly but the effect is not seen after the first season. When nitrogen exists in animal or vegetable matter its action is slower, more uniform, and is continued for an indefinite length of time. Farmyard manure is an example of this action so also are rape cake blood manure, shoddy, guano and many other substances. Such animal refuse can however hardly be classed with artificial manures, and we therefore postpone their further consideration.

Salt.—Salt is a cheap material which may be employed with good effects upon coarse rank pastures and produces the best effects when mixed with lime. Five hundredweight of salt and three to five tons of lime applied in February or March to such rank grass land tends to produce a finer herbage. Salt may also be used as a dressing for wheat at the rate of about 5 cwt. per acre. Dr. Griffith says salt eradicates couch on land infested with it. If this is the case we have an additional excellent reason for applying it. It is also a good dilutent for the better distributing of nitrate of soda and is said to check the disposition to develop too much straw which has been observed after nitrate of soda on wheat. It is also considered by many persons to strengthen the straw of cereal crops and prevents lodging of the crop before harvest. It also destroys slugs and snails and is distasteful to insect life generally. It in this respect resembles soot which is one of the best applications for land affected with these pests.—*Agricultural Gazette.*

The Plants of the Andamans.—Dr. David Prain, Curator of the Herbarium in the Royal Botanical Gardens, Seebpore, has been studying the growth of new plants "intentionally, accidentally, or naturally introduced" in the Andaman Islands since 1866. A list of the Andaman flora in 1866 recorded 520 indigenous species, and the number has since increased to 600, although four of the naturalised plants noted in 1866 have disappeared. A common Indian butterfly has made its appearance since the plant on which its larva feeds became naturalised.—*Pioneer.*

Grant of Land in the Eastern Lowcountry.—We hear that Messrs. W. Gow and Gordon Reeves have been applying for a grant of some thousands of acres of land in the lowcountry to the North-eastward of the Knuckles and Kalupahana range, near the junction of the Kalu and Amban gangas before they fall into the Mahaweliganga and we suppose not far off Polonnaruwa. Two young Surveyors are now busy blocking out in that neighbourhood. The soil is said to be very fine, the land flat with very heavy timber, though great parts have been chenaed. Rainfall is confined to the North-East monsoon and there is a great deal of wind in the South-West. Tea would therefore scarcely flourish there, and it has not transpired what products are likely to be cultivated—perhaps tobacco and cotton. Should a grant be made on lease, there will be conditions as to cultivation, as well as about rent. The outlet would probably be via the North road, 20 miles off.

Detailed Estimates of Plantation Crops.—We have to thank planters in nearly every district in the island for the readiness with which they have responded to our request for approximate estimates of the outturn of tea, coffee, cocoa, cinchona, &c. during the current year. There are a few districts yet unrepresented in our bulky receipts, so that we must wait a week or two before beginning our analysis and compilation, to see how the results bear out the total estimates we have already put forward. We see our contemporary of the "Times" on the 5th instant arrived at the same figures for probable tea exports this year (namely 56,000,000 lb.) as we gave in our estimate on the 20th Jan., Mr. C. S. Armstrong independently sending us the same figures. We think it quite likely however, that Mr. Forbes Laurie's figure of 58,000,000 lb. may prove nearer the actual result.

MATERIALS FOR ROOF COVERING.

We have been asked to which of tho several materials available for covering the roofs of residences in Ceylon, preference should be given if it were entiroly a matter of choice. It must be admitted to be difficult to arrivo at any decision such as would enable a positive answer to be given to such a question. The selection must be dependont on many varying conditions, chief among these being the character of the climate in which the residence might bo situated. Such conditions as they exist between a lowcountry and an upcountry residence differ considerably, and even if a decision could be arrivod at subject to such varianco, there may be the further point to enter into calculation as to the resourcos of the district in which such residence may lie.

When writing some time back on the subject of the half-round tiles which are so largely usod, we entered fully into the many objections to be taken against them. Theoretically, somo authorities are of opinion that for very many reasons the flat roofs so largely employed throughout India and the East generally have much, owing to the character they possess of permanence, to recommend them over every other description of roofing. But, practically, these roofs are insufferably hot. There is no spaco between their flat surface exposed to a burning sun and the living rooms below in which a circulation of air may be maintained, and it is held that this disadvantago counterbalances every preference which may for other reasons be accorded to them. We may, therefore, for our present purpose, leave roofs of this character out of consideration.

But when we turn to other methods of covering our dwellings, we cannot decide upon one which is wholly free from objection. The objection taken in regard to half-round tiling, or, indeed, to earthen tiling of any description, has been dealt with on a previous occasion. Slate is far too costly a material to receive general adoption here; but many consider it is open to fewer objections than almost any other roofing. Slate is light, tho thinness of it does not admit of the great retention of heat which is such an objection to earthenwaro tiles of any kind, and once fixed it is less likely to become disturbed than almost any other covering. Corrugated zinc is disapproved of from its heat-conducting properties, from its liability to corrosion when exposed to sea air, and, when used up in the hill country, to the intense cold it both accepts and transmits. The relatively large sheets also render it liable to stripping in the case of exceptional winds. Shingles, while admirable in many respects, are from their lightness and difficulty of fixing, also in some districts liable to take to partial flight during the same natural disturbing cause · but the difficulty now is to get a supply of really good shingles. Straw thatch would be perfect as a protection against either heat or cold, but it so rapidly decays as to need constant renewal, and in its dry state is liablo to ignition and gives rise to dirt and the harbouring of vormin.

Many old colonists who have had experience all over tho island consider that for the *acme* of comfort so long as it can be properly maintained, there is nothing like a well-madc cadjan thatching. This is light and it is both warm or cool as occasion or circumstances require. But, unfortunately, it has no permanence, and is besides open to tho objection expressed to straw-thatching, that of liability to take fire. The man who by a method of steeping in some chemical

igneous material could both obviate the liability and arrest the rapidity of decay in the plaited coconut leaves known as cadjans, would, in the opinion of very many, confer a special benefit on residents in tropical countries, and one too that ought to benefit the discoverer and patentee. It seems unfortunate that, with such an unlimited supply of the raw material as we possess in Ceylon, such means have as yet remained undiscovered. Who will be first in the field ?

Meantime we aro aware that on upcountry estates an experiment is being tried with shingles mado of the giant bambu. The large stalks are split in two, the inside divisions are cleared away, the bambu is cut into proper lengths and these are tarred and fixed on the roof. In the earthquake region of Westorn Java houses are built entirely of bambu and roofed with plaited sections of *nipa* palm leaf, the *nipa* being the *ginpol* of the Sinhalese, known to the English as "the water coconut." The late Mr. Moens was much surprised, as well he might be, that the bambu was not more utilized in the construction of native houses in Ceylon than is actually the case.

Since writing the above we have received the opinion of a practical engineer of much local experience in favour of what are known as Mangalore tiles. He writes :—

"Undoubtedly the best all round material for the covering of roofs whether for the hill or low country is the Mangalore or Calicut tiles. These tiles are made of the best clay, are well burnt, of good shape and make, and just heavy enough to keep steady under pressure without the aid of weighting down. The Mangalore tiles are non-porous and weather-proof and maintain an even temperature: they are so cleanly made that ceilings are not required in ordinary rooms. As regards cost, the Mangalore tiled roofing with the woodwork complete costs about R4 per square over and above the cost for the ordinary half tiled roofing in Colombo. The tiles are more expensive per thousand, but there is a saving in timber in their favour.

"Many buildings have of recent years been covered with Mangalore tiles in and around Colombo, and their use is being gradually extended through agencies in Colombo and Kandy.

"The subject of material for roof-covering is one that should engago the attention of those interested in the Technical Institute. This interest might take a practical form by the introduction of improvements in the preparation of clay for the manufacture of tiles for roofing, as also in the preparation of caustic tiled pavements and terra cotta ornaments for architectural and decorative purposes.

"There is indeed in this direction a large field open to private enterprise, and really good material for the purposes abovenamed may be found at Seddawatte near Colombo, and at Katugastota and Gatembe near Kandy. All that is wanted is a knowledge of the preparation of the material and the aid of the newest plant, backed of course by capital, for developing an industry which would be apreciated throughout tho island."

THE AUSTRALIAN SHE-OAK has been acclimatised in Aberdeenshire, and there seems every likelihood that it will prosper apace in that comparatively bleak quarter. The specimens which have so far flourished best on Dee-side have been produced from seed brought over from Tasmania, and the young saplings are reported to make headway at the rate of 18 inches a year. This is as much as they do at the Antipodes, and as the she-oak gives the best firewood the world produces it is to be hoped that its cultivation in the North may extend rapidly.—*E. Mail.*

CINCHONA BARK AND QUININE.

[ANNUAL REPORT BY C. E. BOEHRINGER & SÖHNE: WALDHOF NEAR MANNHEIM.]

Waldhof near Mannheim, 12th Jan., 1891.

QUININE.—At the beginning of the year just past manufacturers of quinine were occupied, even more than the rest of mankind, with the consequences of the influenza. The consumption of quinine during the period that the epidemic prevailed has been calculated at 3,000,000 oz. and that estimate is certainly rather below, than above the truth. We are moreover, of the opinion that since the period in question, the consumption of quinine in general, and especially in Europe has increased considerably. Probably those physicians who were about to relegate quinine to the category of obsolete medicines have since become of a quite different opinion.

During the first three quarters of the year 1890, the movements of the market were perfectly natural, and always the legitimate results of the situation. From 1s 2½d per oz. on the 1st. January, the price rose in consequence of the large demand during the months Jan.-February to 1s 3½d to 1s 4d per oz. and followed the decline of the epidemic during March-April by going back to 1s 2½d, oscillated during the quiet summer months between 1s and 1s 1d, and in August rose again in consequence of large orders from America to 1s 2d. Only in the last quarter of the year was the market "artificially" influenced: heavy forced sales depressed the price down to 12½d to 1s 1d first hand, and 11 to 11½d second hand.

PRICES OF SULPHATE OF QUININE.

On 1st Jan.			per oz	On 1st Jan.	per oz
1891	1s	to	1s 1d	1878	10s 4d
1890	1s 2½d	,,	1s 3d	1877	10s 10d
1889	1s 3½d	,,	1s 4d	1876	6s 7d
1888	2s	,,	2s 2d	1875	6s 4d
1887		,,	2s 3d	1874	9s
1886	2s 8d	,,	2s 9d	1873	7s 10d
1885		,,	4s 3d	1872	7s 8d
1884	7s	,,	7s 6d	1871	7s 4d
1883	6s 9d	,,	7s	1870	5s 8d
1882	9s 6d	,,	10s	1869	4s 9d
1881	10s 3d	,,	10s 6d	1868	4s 8d
1880	11s	,,	11s 6d	1822	40s
1879	12s				

Conditions in the producing countries remain subject to the same tendency already indicated by us. The cultivation of the Cinchona in Ceylon steadily decreases, and yields place to the planting of tea and other more profitable growths. The number of two year old Cinchona trees in Ceylon, that as recently as 1868, was reckoned at 70 millions, in 1886 had declined to 35 millions, and at present is estimated at only 19 millions. The falling off in last year's exports of bark from Ceylon compared with 1885-86 amounts to 6,670,000 lb. equivalent to about 2,250,000 oz. of sulphate of quinine.

Java on the other hand sends continually larger supplies of bark:

EXPORT OF BARK FROM JAVA during the season from 1st July to 30th June.

	Amsterdam lb.		Amsterdam lb.
1889-90	abt. 4,750,000	1885-86	abt. 1,531,156
1888-89	4,415,000	1884-85	1,195,976
1887-88	3,492,913	1883-84	1,104,534
1886-87	2,230,276	1882-83	420,668

From 1st July 30th November.

	Amsterdam lb.		Amsterdam lb.
1890	abt. 2,450,000	1887	abt. 1,781,558
1889	2,019,086	1886	922,141
1888	1,825,273	1885	591,085

In the year 1869 the total export of cinchona bark from Java was only 700 A. lb. In respect to this product, the increasing importance of Java as compared with Ceylon, is further illustrated by a comparison of the London and Amsterdam public sales. The first auction at Amsterdam of 876 kilos of cinchona bark took place on 20th October 1870. Up to 1883 only one or two public sales of bark were held there annually, but since 1889 the number of Amsterdam auctions has risen to ten yearly.

PUBLIC SALES OF BARK IN LONDON.

1890	67,528 packages
1889	70,635 ,,
1888	90,470 ,,
1887	99,435 ,,

of which were sold

		oz. Sulph. Quinine.
1890	45,460 packages contg. abt.	4,020,000
1889	.. ..	,, 4,350,000

PUBLIC SALES OF BARK IN AMSTERDAM.

	packgs.	with abt. lb.	contg. abt. oz. Sulp. Quinine.
1890	39,636	7,196,000	4,250,000
1889	24,749	4 562,000	2,720,000
1888	18,216	3,158,000	1,880,000
1887		2,007,000	1,190,000
1886		1,439,000	858,000

of which were sold

1890 about 6,384,000 lb. contg. abt. 3,825,000 oz. Sulph. Quinine.

In point of fact therefore, as regards the quantity of quinine contained in the bark sold Amsterdam has almost placed itself on a par with the London market, and this year may very likely overtake it. It were however prudent not to indulge in any exaggerated speculations in this respect, since the outlook in cinchona cultivation in Java seeems by no means so rosy as frequently described. The fact that the West Java Cinchona Cultivation Maatschappy has resolved to uproot about 2,000,000 cinchona trees on two of its four estates, suggests at all events the advisability of cautious judgment in the question.

The number of cinchona trees in Java is at present estimated at about 32 millions.

EXPORT FROM MALABAR COAST.

The supply of bark last year was smaller than in 1888-89.

From 1st July to 30th June.

	lb.		lb.
1889-90..	.. 1,833,522	1886 87..	.. 272,048
1888-89..	.. 2,218,700	1885-86..	.. 794,528
1887-88..	.. 1,070,160		

The decrease is very little due to local manufacture of quinine, since in the last year under report, only 234 lb. of quinine were made in the Government factories, and as before at a cost considerably greater than the price of the drug if bought in Europe.

Experiments carried on in India since 1886 have furnished proof of the interesting fact that by manuring the cinchona, its contents in quinine can be increased. The natural cinchona officinalis (11 year old trees) for example, which contains on an average only 3 per cent of quinine, under treatment with manure gave the following results:—

With lime and cattle manure	5.19 to 5.98 per cent
fish manure	5.94 ,, 6.82 ,,
bone-meal and cattle manure	5.35 ,, 5.97 ,,
bone-meal	4.95 ,,

With 21 year old trees (renewed bark).

fish manure	8.43 per cent
bone-meal	7.02 ,,

Mossed bark.		Natural bark.	
fish manure	5.97 per cent.	fish manure	5.54 per cent
bone-meal	7.02 ,,	bone-meal	6.85 ,,

The agents employed enrich the bark more especially of the fast growing Succirubras, Ledgers and Hybrids, and act more energetically upon younger than older trees.

BOLIVIA

sent last year a larger proportion of its high standard bark to Hamburg, viz. about 2,188 bales of about 70 lb. each. The London receipts were:

1890	5,574 bales.	1886	3,979 bales.
1889	7,552 do	1885	2 599 do
1888	7,810 do	1884	2,856 do
1887	7,190 do	1883	2,774 do

The cultivation of the Cinchona tree is becoming unprofitable also in Bolivia. The number of trees at present under cultivation is said to exceed 15 millions,

about two-thirds of them being in the province of Mapiri near the northern border whose business centre is Sorrato.

The export of Cinchona bark from the o'her South American states is inconsiderable.

EXPORT FROM MARACAIBO.

1889	195,750 lb.

EXPORTS FROM SAVANILLA.

1889	198,660 lb.
1888	385,836 lb.

JAMAICA.

has not yet realised tbe expectations entertained. The Government plantations yielded only:

1888	3,321 lb.
1887	17,000 „
1886	12,541 „

PRICE OF CINCHONA BARK IN LONDON.

on 1st January	1891	1⅜d to 1½d	per unit
	1890	1¾d to 2 d	do do
	1889	1⅝d to 1¾d	do do
	1888	2¼d to 2½d	do do
	1887	3¼d to 3½d	do do
	1886	4½d to 5 d	do do
	1885	6 d to 7 d	do do

AVERAGE PERCENTAGE OF SULPHATE OF QUININE.

	1890.	1889.	1888.	
Ceylon Cinchona bark ...	2⅛	2⅛	2½	per cent.
East Indian	2	2	2½	do
Java	4	4⅛	4	do
Calisaya cultivated ..	4½	4½	4½	do

STOCKS IN LONDON show a considerable decrease:

	pkgs.		pkgs.
31st Dec. 1890	48,213	31st Dec. 1886	62,350
1889	57,181	1885	61,690
1888	56,754	1884	80,500
1887	59,619	1883	99,667

Estimated in English pounds:

	American	Java, Ceylon, Indian	Total.
1890	3,350,000	5,000,000	8,350,000
1889	4,126,059	5,700,960	9,827,019
1888	4,404,960	5,332,800	9,737,760
1887	5,174,365	4,485,600	9,659,965

Herewith is included a considerable quantity of bark unsuitable for manufacturing purposes. The percentage of the stocks of bark in London, on 31st December 1890, does not probably exceed 2,000,000 oz. sulphate of quinine. Regarding the quantity of quinine held at second hand in London, opinions differ greatly. It is however supposed that the major portion is held firmly, and will be brought into the market only at considerably higher rates. Stocks of bark and quinine elsewhere are unimportant.

The consumption of quinine by the world in general is steadily increasing at the rate of about 10 per cent per annum, and under normal conditions (without influenza) is estimated for the present year at about seven million ounces.

The large and constantly growing share of America in the general consumption is best shown by the following figures:

IMPORT OF QUININE IN NORTH AMERICA.

	oz.		oz.
1874 (fiscal year)	68,097	1882 (fiscal year)	794,495
1875 ...	12,279	1883 ...	1,055,764
1876 ...	22,746	1884 ...	1,263,732
1877 ...	75 804	1885 ...	1,390,126
1878 ...	17,549	1886 ...	1,251,556
1879 ...	228,348	1887 ...	2,180,157
1880 ...	416,998	1888 ...	1,603,936
1881 ...	408,851	1889 ...	2,825,008
		from 1st Jan. to 20th Dec. 1890	3,374,300

We herewith give a resumé of those statistics as are of chief importance, reduced to ounces of sulphate of quinine.

				oz.
Export of bark from Ceylon	lb.			
1890 abt.	8,800,000	c. 2⅛ per	cent. abt.	3,000,000
Export of bark from Java	lb.			oz.
1890 abt.	5,280,000	c. 4 per	cent. abt.	3,380,000
			Total	6,380,000 oz.

The supplies from the other exporting countries are about sufficient to cover the demand for druggist quills.

Stocks of bark in London		about	2,000,000 oz.
Consumption in 1890		„	9,750,000 „
estimated „	„ 1891	„	7,000,000 „

With the help of the given data it will not be found difficult to form an opinion concerning the position of quinine.

COCAINE.—The profits of manufacturers, alike of crude cocaine and of the hydrochlorate, that were greatly reduced already in 1888, were still further curtailed last year. At times indeed, sales could only be effected at a loss to manufacturers, for whilst the high rates for coca leaves were fully maintained, the price of crude cocaine and hydrochlorate fell steadily still further from month to month. We referred already last July to the disproportion between the rates for raw material and the manufactured article. Since then however the position has become greatly changed. Not only coca but also cocaine has risen very considerbly in price.

TEA PREPARATION IN CHINA.

It is rumoured, says a Foochow correspondent of the *North-China Herald*, that a few wealthy natives intend to purchase machinery for preparing tea, and set up an establishment for that purpose in Kien-ning Fu. No charges, we understand, will be made to owners of tea for the first year, and thereafter the charge wil. be far less than the cost of manual labour. The idea is undoubtedly an excellent one, as many tea growers cannot purchase such expensive machinery, and no doubt will be only too glad to avail themselves of an opportunity to have their teas manufactured in a better way than at present, especially if the cost would be, as is said, far less than hand labour. We sincerely hope that the promoters will carry the above plan through, when, we doubt not, many others will follow suit.

THE NON-KEEPING QUALITIES OF CEYLON TEA.

Some months ago our columns contained correspondence and discussion on the subject of the non keeping qualities of Ceylon tea, and the effect of long or short fermentation as the result. It was held by many that the longer the fermentation the longer would the tea keep its flavour and condition, while the opposite theory was held by more than one experienced tea-taster, and, to test the matter as well as it could be tested, we obtained few samples of tea manufactured from the same roll but subjected to different periods of fermentation. One sample had only half-an-hour's fermentation; another two hours'; a third four hours'; and a fourth six hours'. These four teas were tasted by Mr. Herbert Tarrant on the 29th of August, 1890, and he gave his opinion that the tea fermented for two hours was decidedly better than that fermented for half-an-hour, and that that tea had better quality than the four hours' fermented tea, but was much inferior in strength. The six hours' fermented tea, he said, was much the worst. It should be stated that the length of fermentation was not known to Mr. Tarrant when tasting.

These samples were enclosed in lead and put in tin cases sealed and kept by us in a dry place till yesterday (so that they have been over five months in lead), when they were opened and again liquored. The result was that the half-hour fermented tea was declared to be much the best, having gone off least, and retained its flavor far the best. There was little to choose between the two hours' and four hours' fermented teas. Both had gone off about equally, whilst the six hours' fermented tea had gone off more than any of the others. The following is a tabulated statement of the result:—

Samples manufactured from leaf; medium plucking

elevation between 5,000 and 6,000 feet; good soft wither; rolled in Jackson's Excelsior; fired in Venetian; temperature during time of manufacture about 86°. After rolling half-hour small sifted out, and large leaf re-rolled another half-hour hard. Samples manufactured from same roll.

Tasted 29th August 1890.

		Order of Merit.
A.	Half-hour fermented	2nd
B.	Two hours	1st
C.	Four hours	3rd
D.	Six hours	4th

First in order of merit decidedly better than second. Second has much better quality and flavor than No. 3 but is much inferior in strength. Fourth is decidedly the worst.

(Signed) HERBERT TARRANT.

29th August 1890.

The above teas were opened on the 5th of February, 1891—five months afterwards, and the following is the report:—

A. Decidedly the best. Had gone off the least and still retained its flavor,

B. } Cannot separate these two teas. Both gone off
C. } a good deal.

D. Much the worst from every point of view. Had gone off altogether.

(Signed) HERBERT TARRANT.

—Local "Times."

THE KOLA-NUT TRADE.

At the Liverpool County Court before his honor, Judge Collier, Messrs. Broadbridge & Co., of Liverpool, general produce dealers, brought an action against Messrs. Thomas Christy & Co, London, drug importers, to recover the sum of 30*l* 10s 2d, the price of nine barrels of kola nuts which were sold by the plaintiffs to the defendants on November 17 last. Mr. Steel appeared for the plaintiffs and Mr. Pickford for the defendants.

Mr. Steel, in opening the case, put in letters and correspondence which had passed between the plaintiffs and defendants in reference to the kola nuts. The plaintiffs on November 7 wrote to the defendants, asking them if they were buying kola nuts, as they were brokers in Liverpool and their friends had some for sale. On November 12 defendants replied that they were buyers of kola nuts, if of good quality and reasonable price. Plaintiffs then sent samples of the nuts to the defendants, and stated that the owners would accept 6d per lb. The samples were sent on November 14th and on the 15th defendants agreed to purchase certain nine barrels. Defendants said that some of the barrels were not as good as the others, and for these they would give 5d per lb., and that if the offer was accepted, plaintiffs were to forward the lot to their address, but the plaintiffs were to examine each lot and see that there was no palm oil on the nuts. There was no palm oil on the nuts and on the 17th the barrels of kola nuts were sent. On receiving the nuts defendants wrote that they were not up to sample and were of an inferior quality. They offered to pay 4d per lb. for certain samples. Plaintiffs replied that their samples fairly represented the bulk, and they could take no reduction. Hence the dispute. Plaintiffs offered according to the conditions of sale of the General Brokers' Association, to leave the dispute to arbitration. Plaintiffs said they did not sell on "guaranteed sound," but "according to sample." They asked for payment of the nuts, as defendants would not have arbitration in the case. On Dec. 3rd defendants sent to the plaintiffs a cheque for 22*l* 4s 10d instead of the 30*l* 7s 10d which plaintiffs claimed. They returned the cheque. Defendants had now paid the 22*l* 4s 10d into court, and they claimed the sum of 1*l* 1s which they had paid in London to outside brokers to examine the kola nuts there.

George Frederick Howard, a member of the plaintiffs' firm, said: On Oct. 22nd we received a consignment of kola nuts, and sold this consignment as the brokers. The nuts came from the West Coast of Africa. When the steamer arrived the nuts were stored in Liverpool. They were unpacked and emptied out on the floor in bulk. Each lot was kept separate. On Nov. 12th I gave instructions to my warehouseman to take some samples. Three samples were taken and sent by my foreman to the defendants. I was not present when these samples were taken. I saw the large samples in our office which were brought from the warehouse. The largest sample from five barrels would be about 10 lb and the others much smaller. I examined the samples and found that those from five barrels were bright, clear, good kola nuts, and in good condition. Three barrels and a case were not so bright. The nuts in the five barrels were in a good condition, except a few. Some of them were mouldy and of a dark colour. Fresh kola nuts ought to be of a brightish colour. We cut the dark ones open to see if the damage extended, but found it only existed on the outside. The condition of the other lots was similar, but they had not such a bright appearance. They were of a redbrick colour. I did not see the small samples sent to London.

Cross-examined: We sold the nuts as brokers for the firm of Henty & Co. I have not a great experience of these kola nuts. I have sold them before, but not the fresh ones. This was the first lot of fresh ones we sold. I have seen three or four lots of fresh ones. My firm are general produce brokers. I never saw the bulk of the nuts. It is not customary to do so when goods are sold as samples. The warehouseman saw the nuts. After being stored the nuts were out of the barrels all the time. When sold they were repacked. The nuts were good lots. The firm did not sell on "guarantee sound," but on "sample." The firm knew that a few of the nuts were not sound. The sample was a fair sample of the bulk. The firm took a smaller price for the nuts because they were not so fresh as on arrival. It was true they were deteriorating and beginning to grow mouldy. I do not, however, think that they had deteriorated to the extent of 1*d.* per lb. When I received the complaint about the condition of the bulk sent to London I did not get them examined on my own behalf, as I desired the matter to go to arbitration. The arbitrators would then have had the samples examined. When I found the defendants would not arbitrate I thought it was no use for me to do anything in the matter. According to the rules of the General Produce Brokers' Association each side in a dispute could appoint an arbitrator. If one side neglected after three days' notice to do so, the Association could appoint one. The defendants sent down samples of what they said the bulk of the kola nuts were like. The arbitrators could have called for whatever samples they liked if appointed. Defendants had the nuts. I am not a member of the General Brokers' Association. I never named an arbitrator because the goods had gone from the firm's possession, and arbitration would have been no good. The defendants ignored everything, and it would have been no good, going on without them. The delay in selling the goods caused them to deteriorate to a slight extent. If they had been quickly sold they could have got 1d per lb. more.

Robert Taylor, the plaintiffs' warehouseman, corroborated the last witness's testimony. He also said the nuts were sampled by means of a spade. They were lifted by a spade into paper. A shovel was employed to get as fair a sample as they could. The general condition of the nuts was good, although some were not sound. The nuts were all mixed through when a sample was taken. After taking the large samples they were taken up to the office.

Cross-examined: I have seen many samples of kola nuts in different warehouses. I have seen fresh ones. The nuts were sampled after they had been lying on the floor for three days. I did not examine the nuts when I put them in the barrels again.

Re-examined by Mr. Steel:—The nuts were brought from the quay on Oct. 27th and were emptied on the floor a week after to keep them dry. The nuts would

be on the quay for about four days before they were removed.

Arthur Broadbridge, a salesman in the employ of the plaintiffs, said he took three samples of nuts on Nov. 12th from the bulk, and on the 14th took three samples from these for defendants. He put his hands in the centre of the pile to see if the smaller samples were as nearly as possible like the big sample retained. Some of the nuts were a little brown and rusty. There were only one or two mouldy ones. One of the marks of the goods were not so good as another.

Mr. Steel:—We took a less price for these.

Cross-examined:—The sample I took was a selected sample from a large sample. I was about ten minutes over it. If I had made a mistake the bulk would not have corresponded with the large sample. The plaintiffs' business was in fibre, oils, &c. He never saw the bulk of the nuts.

His Honor: Are the samples improved by handling?

Witness: No, sir.

Mr. Steel: If you rub a nut you improve its colour

Witness: Yes; but there was only a little mould on some. I took every pains to see that the small samples was similar to the large one.

This was the plaintiffs' case.

Mr. Pickford, for the defence, said he would call evidence to show that the nuts were not up to sample. He submitted that the only question was whether the deduction they had made was correct. Besides this, he failed to see how the plaintiffs who acted as brokers were entitled to sue as principals. The defendants knew more about kola nuts than anybody else in England. They had practically made the trade in kola nuts in this country. They had called in Messrs. Lambert & Strong, who had great experience in these nuts, to see the nuts. Mr. Lambert would tell them that the bulk of the nuts did not correspond with the sample.

The defendant, Thomas Christy, was called, and said: I have had nine or ten years' experience in kola nuts. Until a year ago all the kola nuts which came into Europe passed through my hands. I pointed out to the plaintiffs when they offered the nuts for sale that mouldy nuts were useless, and that I must have them fresh. The nuts are used medicinally, also for refining beer. The nuts prevent people going on drinking. (Laughter.)

Mr. Pickford: How does it do that?

Witness: It makes people nauseate. If a man is lying insensibly drunk on the floor, or under the table, and a nut were put into his mouth, in fifteen minutes the man would rise, and one would not know he had drink. He would not even have a headache. Even if within four or five days he went to take spirits again, the effects of the nut would still produce a nausea in his throat and mouth. (Laughter.) This was a well-known scientific fact. As the nuts are used medicinally, it is an important matter not to have them mouldy. The samples of nuts I received from the plaintiffs looked very nice. I was attracted by the nice appearance of the nuts, and I entered into negotiations for them. When the bulk came forward, I found they did not agree with the sample at all. The day after the nuts arrived I telegraphed repeatedly to the plaintiffs about them, in order to come to some arrangement. A kola nut, when once it becomes mouldy, changes its character, and becomes a fungus. They are then o no use. The bulk of the nuts were turned out in Mr. Lambert's presence, and they were wet, slimy, and mouldy in many instances. The keeping of the nuts a fortnight in the barrels would have a tendency to deteriorate them. The top of the barrels would be better than the bottom and centre. The nuts on examination had turned out not to be worth as much as the sum sent for them. I sent a letter to the plaintiffs to examine each bag as to their condition, and to see that there was no palm oil upon them.

Mr. Steel: There was none in fact.

Cross-examined: It was not until seven days ago, when the nuts came back from the drier, that I found that they were not of the value of Mr. Lambert's certificate. I know my solitors have paid the sum of 22*l* 4*s* 10*d* into court. I sent the mouldy nuts to the driers. Messrs. Lambert & Strong, when they examined the nuts, gave it as their opinion that the nuts were worth the amount certified. I could have bought nuts equal to the sample sent to me for 3d per lb. in London. I gave the higher price for the nuts in Liverpool because I wanted them for growing purposes. I send them all over the world. At the time I purchased the nuts I looked upon the plaintiffs as my brokers. The money I sent was returned. If kola nuts are bruised or expressed to the atmosphere any time they deteriorate.

Mr. Lambert (of the firm of Lambert & Strong, London) said he had examined the nuts at the request of the defendant, and gave him a certificate of the value. He thought he was called in by both sides as an arbitrator.

Some arguments by the counsel ensued, Mr Pickford maintaining that the plaintiffs were not entitled to sue, as the plaintiffs could not be brokers and principals at the same time.

Mr. Steel said that the defendants, in paying the money which had been returned to them, admitted that the plaintiffs were the right people to sue. Plaintiffs had the goods consigned to them for sale. He would ask his honor to say that there was no tender.

Mr. Pickford said the defence of tender was no good unless the money was paid into court.

Mr. Steel: The defendants having paid the money into court, we could not get it until there had been a judgment.

His Honor remarked that he thought the contention of Mr. Pickford about the plaintiffs not being able to sue came too late.

Mr. Pickford said that money which was paid into court was paid to the plaintiffs.

His Honor said he must take time to consider the question whether the plaintiffs were entitled to sue or not. He would also require time to consider the question of tender, and would therefore reserve judgment.

By permission of his honor plaintiff was recalled, and, in answer to Mr. Steel, said he received commission from Messrs. Henty & Co. of 1½ per cent for selling on their account.

His Honor: I will consider my judgment, and deliver it on a later day.

JUDGMENT.

(Delivered on Friday, Jan. 2, 1891.)

His Honor said: I find that the nuts delivered were not equal to sample, and that the sum of 23*l.* 5*s.* 10*d.* is the sum which the plaintiffs are entitled to recover. The tender of 22*l.* 4*s.* 10*d.* was, therefore, insufficient, and my judgment must be for the plaintiffs for 23*l.* 5*s.* 10*d.* But, except as to the costs paid into court, I direct that the judgment shall not carry costs, the defendants being practically successful in the action. A point was raised at the hearing, and left for my decision, as to whether the plaintiffs were entitled to recover at all from the defendants, inasmuch as they had acted as defendants' brokers in the transaction. This contention rested on a bought-note dated November 17, which was (so far as is material) in the following terms:—"We have this day bought for you the following goods. Customary allowances and Liverpool general-brokers' conditions of sale. Payment (before delivery if required), cash, in fourteen days, less 2½ per cent., brokerage 1 per cent. Signed, Broadbridge & Co." Prompted I suppose, by the desire to get a commission from both parties (for Mr. Howard admitted that he received commission from his selling principal), Messrs. Broadbridge were induced to represent themselves in this note as the brokers for Messrs. Christy & Co. If they were really so, of course they could not recover in this action, but I think that the correspondence shows that they were acting as

sellers' brokers, with an undisclosed principal; and, although they call themselves brokers, it would be more correct to describe them as factors. And the transaction, notwithstanding the bought-note, was, in my opinion, one of sale and purchase between the plaintiffs, who had possession of the goods, and the defendants; and the defendants, after having received the bought-note, took the same view, for they tendered the 22*l.* 4*s.* 10*d.* I think, therefore, that the plaintiffs are not precluded on this ground from recovering.—*Chemist and Druggist.*

THE BUSINESS OF BROKERS.

Litigiousness is not the prominent characteristic of the fraternity of brokers of our day—at least, not of those whose dealings are chiefly in drugs. Very rarely do we have the opportunity of learning anything about the law which governs their transactions from the conclusive test of a contest in the courts. The case tried before the County Court judge at Liverpool, the report of which we give above, seemed at one time likely to afford an opportunity for a display of ingenious legal lore, and we are a little disappointed that his Honour of that court should have contented himself with so ingeniously gliding round the difficulty which had been raised, in the somewhat uninteresting judgment which we have to record. Whether the sellers and the buyers of the kola nuts in question are equally satisfied, or equally dissatisfied, we do not know; their dispute was not a very imposing one, and onlookers are likely to come to the conclusion that the decision is a practically just one. But, out of curiosity, we should have been pleased to have had a judicial essay on the interesting point submitted to the court whether the brokers, taking as they did, and as is usual in their business a commission from both buyer and seller, were in a position to sue one of the parties as if they were principals. We suppose the custom of the double percentage is so well established, and so universally understood, that there can be no question of its legality for brokers; but there are plenty of cases from which it may be gathered that such a system is scarcely permissible to other persons acting in a fiduciary capacity.

In Judge Collier's view, the plantiffs in the case reported were to be regarded rather as factors than as brokers. If they were such, they had an undoubted right to sue. But the bought note, in which they expressly held themselves out as the agents, for the buyers, was inconsistent with their legal standing as factors, and had to be regarded with amiable charity by the learned judge. The truth is that the broker's business, as it is now conducted, is not very clearly defined. To a considerable extent it is governed by the Factors Act, 1889, but the generally-understood distinction between factors and brokers is, that factors have possession of the goods they sell, and that brokers have not. When they are not factors in the legal sense, they are simply mercantile agents, and are subject to the ordinary laws, even if these should clash with their own carefully-devised rules and conditions. Until the Act of 14, brokers in the City of London were under the control of the Corporation, and were liable to a penalty if they assumed the title. They bound themselves by oath to a certain course of conduct, one stipulation being that they should not buy and sell merchandise on their own account. The Corporation did not rigidly enforce its rights, took fees from those willing to pay them, and generally left others alone. The Brokers Act of 1884, by abolishing the control of the City authorities, removed the restrictions on the business as well as on the title.

Brokers have a rather mixed record in our history. The name seems to have come into use in England first in the fourteenth century, and from then on to the sixteenth century the middlemen in trade were called brokers, broggers, and brocars promiscuously. Broggers are mentioned in a statue of Richard II., which requires that they shall not practise as such in any mystery except they be chosen by such mystery. The name is said to have descendend from the Norman-French "brokier," and that from the old French "brechier," which meant one who tapped or broached wine. The modern dealers in "wine from the wood" are the original and most genuine of brokers. But as foreign trade grew, and imports from foreign countries became more abundant, the men who found customers for the cargoes reaching our ports became by far the richest and most highly-esteemed of the various kinds of brokers. The business was a very important one in the early part of the seventeenth century, and great was the jealousy between the English brokers and the "sonnes of Aliens" who competed with them. In the Guildhall Library there is preserved a curious "petition of English brokers lawfully admitted to deale betweene marchants in London" to the House of Commons of the year 1620. It humbly sheweth "That for many ages past it was the use and custome of the Cittie of London that none but freemen of the Cittie being Englishmen borne and housholders should be admitted to exercise the trade of a Broker between Marchant and Marchant, whereby great commodity did arise to the common wealth for many years together." But now "in these dayes many strangers borne and the sonnes of aliens and others not lawfully admitted doe use and exercise Brocage between Marchants, by which means many intolerable and insupportable mischiefs do daylie happe unto this Kingdom and State." Among the inconveniences enumerated from the conduct of these strangers and sonnes of aliens were that not only in London, but also "in Exeter, Norwich, Colchester, Canterbury, Sandwich, and many other places," they were buying and selling "both in grosse and by retaile,... driving a wonderfull home trade in this realme, to their private inriching and impoverishment of the English borne subjects." They were said to seek only "the profit of the Marchant strangers, and how to sell his commodities at the uttermost price." Thus they "inhaunced" the value of commodities. Other reasons given to their discredit were that they probably melted down the bullion they obtained and sent it abroad, and that through them the dealings of the Englishe could not be kept secret.

"The Act against Brokers" passed in the reign of James I., and still in force, reflects in its curious phraseology another grievance which the artistocratic brokers seem to have entertained. They evidently did not approve of Dick, Tom, and Harry calling themselves by the title which they had made honourable. "For as much as," declares this statute, "of long and ancient Time, by the divers hundred years there have been used within the city of London and Liberties thereof, certain Freemen of the City, selected out of the Companies and Mysteries whereof they are free and members and the same persons to be presented by at least six approved and known Honest persons of the same Mystery to the Lord Mayor of London for the Time being, and to the Aldermen his brethren, and to be recommended by such Presentors to be persons for their known Honesty, Integrity, and Faithfulness, Persons meet for to be Broker or Brokers." These "having taken their corporal Oaths before the said Lord Mayor and Aldermen to use and demean themselves uprightly and faithfully between Merchant English and Merchant Strangers

and Tradesmen in the contriving, making and concluding Bargains and Contracts to be made between them concerning their Wares and Merchandizes to be brought and sold and contracted for within the City of London." These persons, the Act goes on recite, "have had and born the name of Brokers, and been known, called, and taken for Brokers, and dealing in Brokerage or Brokery," and they "never of any ancient Time used to buy and sell Garments, Household Stuff," and suchlike. But, the Act goes on to deduce that, "certain Freemen of the City had forsaken their manual occupations, and did daily set up a Trade of buying and selling and taking to Pawn all kind of Worn Apparel, finding that the same is a more idle and easier kind of Trade of Living." These brokers of the baser sort are described as "Friperers and no Brokers," and elsewhere as "upstart Brokers," and they have been found to encourage "bad and lewd persons to rob and steal." The Act does not, as the reader would anticipate from its preamble, make any provision for the protection of the title. Its object is simply to impose a fine on those objectionable furniture and apparel brokers who should receive stolen goods.

That class of dealers had been called brokers for "divers hundreds of years" before King James's day, and the name and occupation still survive among us. In a sense, it will be seen, all middlemen are brokers. Those whose original business was "the contriving, making, and concluding Bargains and Contracts between Merchant English and Strangers," still tend to become merchants themselves, as they did two or three centuries ago, but the middleman or broker would seem to be as necessary now as he was then in various departments of our commerce, notwithstanding the alleged disposition of the age to crush him out. —*Chemist and Druggist.*

SISAL HEMP.

The following detailed particulars of planting, working, general management and final out turn of Sisal Hemp (of commerce) were written in 1886 by Mr. Daniel J. Stoddart, a well known resident of Jamaica:—

INTRODUCTION.

In putting the present work of Sisal Hemp planting into print, and introducing it to the public of Jamaica, I do so with the object of promoting, if possible, the interests of this Island by advising the cultivation of the plant, considering it nothing less than an obligation of mine. I shall endeavour to put before my readers the planting, working, and everything else connected with Sisal Hemp in as few words possible, and yet in as explicit a manner as to be fully comprehensible. When I first landed on the shores of that great hemp country Yucatan, one of the States of Mexico, and saw the immense trade in hemp, by which a large amount of money is put in circulation, and the fibre finding such an immediate sale all over Europe, but principally in the United States of America, the demand being so great, it attracted very much my notice and consequently claimed my attention which I immediately gave.

The importance of this fibre may be judged when it is known as the sole production of Yucatan and the only article of export.

Too much cannot be said of this valuable plant which is the great and only source of wealth on the Peninsula where there are to be seen plantations of pure hemp, comprising each an area of about two thousand acres. The increasing demand for it all over the world is made manifest by the number of new plantations being opened out there. There is no doubt that there are soils in Jamaica highly adapted to the cultivation of Sisal Hemp, and that the climate is identical with the tropical nature of Yucatan. What makes me more sanguine about its success here is that some time ago I brought out a few of the very young plants, distributed them to friends who planted them, and they are to be seen now growing beautifully and sending out suckers.

My practical experience in Yucatan and day and night work in connection with this hemp, having been in the working and management of it myself, enable me to write fully on the matter. This small pamphlet is specially dedicated to Jamaica, with the hope that those into whose hands it may fall will lose no time in taking up the matter and starting the cultivation. As far as its profit is concerned, putting the expenses at the extreme and the fibre at the lowest price in New York, of 4¼ cents a pound, Sisal Hemp gives a return of about 75 per cent.

In a part of this book will be found a complete statement of the cost of working, out-turn and details of production, &c. An important point is that a plantation of hundreds of acres producing a good deal for a year's crop requires only a small "plant of machinery," as well as buildings, &c. I speak comparatively. The market for this fibre is already well established; it does not therefore need any introduction but must meet with a ready sale. I do warmly and faithfully recommend the planting of this hemp as a safe and sure investment, there being nothing that can properly be called *risk* in its culture. Several times I have advocated in the papers the cultivation of Sisal Hemp, but space prevented me giving a minute description of it. To remedy this and so as to have the public impressed with the value of it I have selected this medium, wherein is to be seen all the details, which I trust will prove of some interest to my readers, who I have no doubt will agree with me in saying that the establishment of plantations of this sort in our Island will be a fair stride in her agriculture.

CHAPTER I.

DESCRIPTION OF THE PLANT.

The Sisal Hemp plant of Yucatan, Agave Itxli or Henequen, as it is called there, would in its first appearance resemble our "Keratto," but upon close observation will be found widely different, being of a distinct style of growth; the leaves not growing out so near each other and of a light green, exceedingly thick. For this reason they give so much fibre which for strength exceeds all others. The leaves of the plant, which grow with prickles or thorns on the edges, the thickness of which is greatest at the ends, where they are joined to the tree and tapers off towards the edges and other ends which have hard and sharp points, are slightly gutter formed; they grow first upright, shutting up into one another, then gradually spread open, and finally bend down around the tree.

The hard nature of this plant, which is almost incredible, proves itself beyond a doubt, insomuch that if rooted up it will remain alive for weeks without being replanted.

There is positively no failure in it as with or without rain, good or bad weather, it grows and flourishes and never dies. It is a "semper virent" in every sense of the word, and in my estimation can have no equal in its life-lasting quality.

For a proof of this I have known during my stay in Yucatan, when it only rained one month in the year, just a few showers, and the remaining eleven months pure dry weather, that the cattle died of starvation; yet, during all that time the plant remained perfectly intact, not the slightest failure—not the least affected by the drought, retaining its greenness, giving its return of every day cutting and working, and as a fact producing more fibre, throwing out less bagasse, and all this in a country devoid of rivers and streams

Neither ploughing nor manuring of land is required for the cultivation of this hemp plant: no animal of any kind eats it.

When the fields have arrived to "cutting age" and the work once begun there is no "out of crop" but a perpetual work all the year round.

The plant lasts according to the best authorities for at least 25 years in cutting state, pending on the soil and treatment.

It takes at most three years after being planted to arrive to its cutting state. At this stage and onwards during its existence the more a plant is cut the better it thrives, the more leaves it throws out; while if it were to be left uncut it would, in a short time, growing until it finds no other vent, send out a pole from the centre, the appearance of which determines its death although young, and do what you may it ultimately dies,—singularly strange, but really true, so that the greatest caution is to be observed as soon as it reaches this state, which will be found fully explained in the chapter on cutting, &c.

After it reaches the age of 12 months it will, if planted in the proper manner, begin to send out around its root young shoots or suckers; and when it arrives to the age of cutting, innumerable quantities of them, so that when there is no place to be planted they have to be cut off and thrown away, the field not admitting of any more plants than those already set out, and more than that, if these shoots are allowed to remain they greatly injure the mother plant by taking from it the nourishment it needs. Inasmuch as I make these remarks my readers must not for a moment think it a delicate plant; on the contrary, naturally with care it will turn to better account.

To replenish a field it would only be necessary when, after a number of years, the mother plants show signs of fading, to plant at the proper distances, by the sides of the old plants or between them young shoots which three years after and upon the failure of the old ones will be fit for cutting, when a new field will be up without any loss of time or suspension of work. This is undoubtedly the practice carried on in Yucatan, and a very good one, there being no necessity of new lands for the fresh planting, as the old fields suit admirably and give good results.

Old worked lands are known to give the best yield.

CHAPTER II.

THE DIFFERENT SPECIES OF HEMP PLANTS.

There are in Yucatan seven classes of hemp plants with indigenous names, which they retain to the present day. It may not be out of place and uninteresting to give a description of each of them. The following are their names; Sacqui, Cbelem, Yaxqui, Chuchumqui, Babqui, Quitamqui and Cajum. In the first place is considered Sacqui; this name, according to the Indian dialect, signifies white, not by its fibre being white, but because the greenness of the plant is lighter than any other. This class of hemp plant is the one that has been attended to in its propagation on account of all its good qualities, and of which chiefly the plantations consist, forming the article of export in the raw as well as manufactured state and giving all that is desired, viz., abundance, flexibility, whiteness, strength, length and weight. The second Chelem, partly wild, is found in abundance in the woods and is productive. It is held to be of good quality because its fibre is white and strong. Yaxqui takes the third place; this has short leaves, gives a small quantity of filament which is soft, fine and strong. The fourth class, Chuchumqui, is much like the Sacqui, with the difference that its leaves are harder and thicker and its fibre coarser and less flexible, which makes it unacceptable.

The fifth class called Babqui has leaves which produce a small quantity of fibre although of good quality. In the sixth place is considered Quitamqui of short thin leaves, producing little fibre, through which it is not appreciated.

In the seventh and last class stands Cajum; this has long leaves, very delicate, of pallid colour and lives a small quantity of fibre.

To return to our object: the first class Sacqui, which this work relates to and treates of entirely, is what claims our attention; it is the plant we look for, the one we want, having in it both quantity and quality, and all otherwise that renders it acceptable and worthy of cultivation. The application of the word "Sisal" to this hemp, by which it is known and called, is derived from a port of Yucatan of that name, whence it used to be shipped formerly, but which has been abandoned for the other port of Progresso, where the total shipping of that State is now carried on.

CHAPTER III.

THE SORT OF LAND AND THE PREPARATION OF IT.

For the cultivation of this plant due regard should be paid to the selection of the lands as well as the locality, Gravelly, stony and rocky lands are most appropriate, also any other dry and impoverished soil. Swampy land would be very unsuitable as it keeps unabsorbed a large amount of water. Sisal Hemp planted on rocky lands is perfectly at home and will astonish any one to know how it survived and grew. There is no objection whatever to the poorest land or those worked for many years, even lands that are considered ruined by continual fibres, such as our savannahs.

These are quite suitable for the plant, provided they do not keep water on them very long.

Sugar estates recently thrown out of cultivation are unfit from the manure which renders the land rich, as the consequences would be that the plants grow rapidly, give a large leaf, but produce no fibre. The same would, I consider, apply to the very cool mountain climate of Jamaica where it might grow, but give little or no fibre.

It requires all the heat possible to give good results. It would be necessary in the selection of the lands to have level ones as near as possible, which will admit of the easy and cheap carriage of the leaves from the field to the machine.

The Preparation of the Land.—Of this no consideration needs be taken apart from having the land cleaned up and fenced, ploughing and manuring not coming in the way at all.

After the selection of the land has been made, proceed in the month of June or July, as is customary in Jamaica, to cut down and clean it up, taking care to have the trees cut as close to the earth as is possible, leaving in this way very short stumps, giving room to the play the leaves ought to have. The stumps should be burnt out or taken out somehow, so as to create regularity in the planting; all this should be done and the land made clean to meet the month of September, which generally brings much rain; if a return of very high weed give it a cleaning and so have it prepared for the reception of the plants as this will be the opportune time to put them in, taking advantage of the seasons to make a good start, all the plants being provided in their nursery beforehand.

The land for the planting of Sisal Hemp must be entirely free from all shade as the plant requires very much the aid of the sun to forward its growth and give the necessary result; it would not thrive if shaded, the more heat the more fibre it turns out there being less bagasse.

It may be planted any month of the year, but it is wiser to do so during rainy seasons, for the plants getting a fair start will not be retarded so much in their growth as they would otherwise and consequently will give a return far sooner.

Fences are only required when the plants are young, as being diminutive they would be trampled or knocked out their holes, but so soon as they pass that condition fencing becomes more a luxury than a necessity, the reason of which (already said) is that no animal molests the plant, rather keeping away from it.

CHAPTER IV.

THE YOUNG PLANTS, THEIR SELECTION, THE NURSERY FOR THEIR FIRST RECEPTION, FIELD PLANTING.

In obtaining the young plants the younger they can be got the better it will be, as they grow much more

rapidly and arrive to maturity earlier; on the other hand they should not exceed 25 or 26 inches in height, for these reasons, that they are more productive, being quicker in giving suckers or shoots and a great number of them at the same time growing with more vigor.

If the field be not ready at the time of receiving the plants, the cultivator must immediately establish a nursery for them, which consists in getting a piece of soft land or digging up for the purpose and securing it with a fence; this place must be free of all shade, as this would injure seriously the plant which requires all the exposure to the sun.

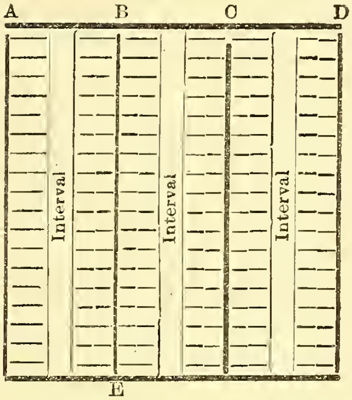
In getting the plants it is precisely necessary that their main roots remain on them as being for transportation; they will by this retain their verdure for a long time. In the nursery they must be planted at the distance of 18 inches apart, which makes about nineteen thousand suckers to the acre, and in the following manner: first take off the dry leaves, then cut the main roots clean off and pare as closely to the trunks as possibly all round without injuring them, nor so deep as to allow the leaves to fall off; after this place them in the ground perpendicularly, putting in and covering only the inferior parts of the trunks dirt; all this care and attention in their infancy is the way of having quick returns, and although they be not yet planted in the field still they merit this attention which will amply repay the planter, as they lose no time in developing while in the nursery, which is an advancement in their growth and when transplanted in the field become ripe sooner, whereas if thoughtlessly cast aside to await field planting will naturally be very much kept back.

Field Planting.—The idea of taking advantage of the land in setting out a great number of plants has been carried in some cases to such an extent in Yucatan as to be prejudicial not alone in the plants not developing fully but for the material difficulty which is presented in the culture and exploration of them when they are grown up, as the leaves of one plant meeting those of another stop with their sharp points the passage between them, preventing easy approach to the trunks, a thing absolutely necessary for cleaning the field and removing the shoots destined to the reproduction.

The general system now in planting is 12 by 6, *i.e.*, the rows twelve feet wide and the plants six feet apart in the rows which leaves clear passages of 12 feet between the rows, thereby giving sufficient room with facility for the inspection of them and for the pasturage of cattle and horsekind, and spaces of 6 feet between the plants which permit the easy approach to the trunks for weeding and getting out the shoots that spring at foot of plant; experience has proved this the best mode of planting; it also allows the free penetration of the heat of the sun whose effects on the plant are wonderful. The above distances give six hundred and five (605) plants to the acre. Now, after having the field perfectly clean and ready, open the holes for the reception of the plants by first stretching a line with the distances marked off, or it may be pegged out as the cultivator likes, so that it be straight and regular, which must give it a fine view.

The holes to be made can be dug with a hoe or common digger, and must be about as large enough to receive only the lower parts of the trunks of the plants which should be put in a perpendicular manner and the dirt drawn around, leaving exposed as much of the trunks possible which accelerates their growth. The plant must, however, after being taken from the nursery and prior to setting out in the field be pared off end, if found necessary, which will be in the case of any roots sprigging out during its stay in the nursery, must be cut off. It ought to be treated in exactly the same manner as when it was being planted in nursery, which is already explained; it is wonderful to know the advantage it gains by this treatment; it is not too much when I say it puts on a year's growth to what it would have otherwise.

As the spaces above would not be sufficiently wide for the carts to go into without injuring the leaves, it is therefore necessary to have wider ones or intervals where they may take up to carry to the machine the leaves which are put at those intervals by the cutters; the intervals ought to be wide enough to admit of two carts passing each other freely. For ease to the cutter, as well as convenience and economy to the planter, I suggest a plan of laying out a field of say 31½ chains square, as the following figure shows:—



The field is divided into three sections, each of which measures 10½ chains, and is represented as follows:—

A to B first section, B to C second section, C to D third section; in the middle of each runs an interval of proper width having a depth on either side within each section of about five chains. The short lines drawn across indicate the rows of hemp between which the cutter works, and therefore has—while cutting in any section—a distance of not more than five chains to carry the leaves to the interval, where the cart gets loaded. Each section has its boundary line as is shown from B to E.

It will be found, if this plan is adopted, how much the carriage of leaves is facilitated, being done quickly to the great interest of the cultivator.

Cost of paring roots and planting suckers in the field.—They are pared at the rate of one penny half-penny per 100, by which a boy or woman can earn a shilling to one shilling and threepence per day, as one person will pare easily 1,000 plants for the day.

It is worth about four shillings and sixpence per acre (605 plants) or ninepence per 100 to line out, dig holes, drop suckers and plant. One man and a boy can plant at least 300 suckers (½ acre) per day which will give them two shillings and threepence, the boy to assist stretching the line and to drop the plants, one to each hole.

If the suckers are planted in the correct manner there will hardly be any supplying required. I have seen thousands planted, have planted them myself without one failing; more than this, I will at any time guarantee to plant five hundred thousand suckers without the loss of a single one.

CHAPTER V.

AFTER CULTURE, OTHER PLANTS IN FIELD, POLE.

The after culture consists first in attending to the plants in the field and keeping them free from weed.

The number of times a field ought to be cleaned in a year cannot be determined; if the planter wishes to obtain all the results possible he should stick to the rule that "the field be constantly kept in a state of cleanness;" it is not altogether requisite to clean the field when the weeds are below the level of the plants, as at that height they do little or no harm, but they should never be allowed to be on the same height or reach above them. The plant is never moulded in Yucatan; it is considered there that ploughing and moulding (where admissible) would prevent it generating as it ought. In my experience I know as a fact that the less soft the earth the sooner it produces shoots.

Next, the young suckers or shoots that may grow around the mother plant ought to be taken away early for planting other fields; if not required they should still be cut off and thrown away; if they remain they become hurtful, as they take in the nutriment which the mother plant requires and should have.

In my opinion there would not be any necessity of resorting to the destruction of the plants, for if once started here the owners of plantations would find customers for the purchase of as many as their fields would be capable of turning out.

The purchaser must not at that time forget to take the necessary precautions as are already advised and explained in subjecting the suckers to *Nursery treatment* if the field be not ready to receive them.

There being wide space anything of low growth may be planted in the field up to harvesting which will not choke the plants. I must again advise my readers not to cultivate what will spring above the hemp, for that would keep back the plants.

Pole.—The sign of the termination of the existence of a Sisal Hemp plant is when it sends out a pole from the middle; this happens when the plant arrives to cutting age and the leaves are not cut, for notwithstanding its youth it dies, or in the other case where the tree attains old age, then it is natural. If this pole were allowed to grow it would reach a height of from 12 to 18 feet; in the upper part it throws forth branches with flowers. When the pole begins to come out and gains a length of about 3 or 4 feet is the customary time to cut it off close to the body of the tree without injuring the leaves, which will be matured and taken off before the plant dies altogether; the practice of cutting the pole is to prevent it from flowering, as it is thought that its flowers are injurious to the young shoots at foot of mother plant. In the plant of quick growth the pole, immediately after it comes out, begins to send out small suckers similar to those produced around the root, only very diminutive, but these are of no great value, and if planted would cause a degeneracy; producing none, or if any, very few shoots although they may grow well as plants. This chapter ought not to be closed without recording that apart from the shoots which grow around the root of the plant and those which the pole produces Sisal Hemp possesses another medium of reproduction, and this is in its seeds. These may be found in large quantities in the banging capsules of the superior ramifications of the pole (when this is allowed to grow) and if they are gathered in a ripe state and dried may be sown in the same manner as any other seed, and it is believed that small plants would be obtained equal to those which are got in the usual manner. I do not doubt the fruitfulness of the seed as, although I have not personally experimented on it, old planters who are reliable authorities assured me that they have been sown and afterwards planted with good results. I mention this merely to show the different ways this hemp is produced, as industriously speaking it would not be of great utility to have recourse to this mode of reproduction when nature has given a style more rapid and efficacious and consequently more adapted to the exigency of its growth.

CHAPTER VI.

HARVESTING OF THE LEAVES, TOOL USED FOR CUTTING, CARRIAGE FROM THE FIELD.

We now arrive to a point which is to show us when the leaves are fit for the machine to extract the fibre, a thing of great importance. For the harvesting of the leaves we must take into account first their length, second their ripeness.

1st. *The Length.*—The length of the leaf matters a good deal as fibre of this class (Sisal Hemp) is only admitted into the market and rendered saleable when it has a length of at least three feet; the leaf generally with good cultivation reaches the proper length at the age of three years and on quick soil before this; the leaf increases in length as the plant increases in years. I have seen fibre 4 feet 6 inches long from hemp a few years old.

The determined length therefore of the leaf as it stands on the tree should not be less than 3 feet, in order that after trimming off its sharp point it may turn out the fibre to the least desired length; this is an invariable rule and of primary importance. I am certain the plant will attain this in Jamaica earlier than it does in Yucatan, thereby yielding its profits sooner.

2nd. *The Ripeness.*—This consists in (A) its position on the tree, and (B) its color, chiefly the former.

(A.) *Its Position on the Tree.*—So soon as the leaf which at first grew upright and afterwards inclined downwards, getting longer during that time, reaches a horizontal from the trunk it may be considered ripe and be at once cut. After it moves from this position towards the earth it grows no longer but begins to shrivel and after its point touches the earth it decays. If allowed to reach this state and cut it will be found after extraction to contain a spotted fibre and less quantity than a ripe leaf; the result of an unripe leaf would be similar in producing less fibre with the exception of not being spotted.

(B.) *The Color.*—The natural color of the leaf is a light green, and this on the leaf maturing will change to a dark green which is easily perceptible and which on the leaf reaching the ripe position, as already mentioned, will show up fully, confirming at once without going any further the truth of the leaf's ripeness. The above description of the length and ripeness of the leaf does not imply that it contained no fibre before this time, quite the opposite, it had all the time, and were a fibre of short length marketable could have been started upon twelve or fifteen months after planting by, course cutting those leaves which are really ripe. From its infancy the leaves are continually falling down and dropping off, given place to the new ones which grow out.

The knife for cutting the leaves from the tree must be of a half round form in the shape of a scythe or grass knife, but of less diameter, therefore smaller, with a short hollow handle to admit of a wooden one, of good length, necessary to reach to the trunk of the plant: and appreciated for its lightness; the knife deserves to be of good steel and kept sharp to give a clean cut and facilitate the cutter.

To cut the leaf in the proper manner the cutter must put himself in such a position as to face the leaf from the side, the last or bottom leaf ought to be cut first so as to prevent any injury to the fibre from the knife slipping and cutting into the next leaf, which would be the case if the top ones were cut first. The knife must be started on the leaf from one side or edge and drawn across, and it will be found to come off freely and nicely. The greatest caution must be observed to cut the leaf as close as possible to the trunk of the tree; neglecting this important duty will end in losses; first, the leaf not cut closely would lose a small quantity of fibre; that arrives to a good deal in many thousands; second, if the stump of the leaf where disunited be any length from the trunk it injures seriously the tree, spoils its vigor and makes its existence a short one.

Immediately after the leaf is cut and before taken away the prickles on both edges a'so the sharp point at the end must be trimmed off, which can be done with a small cutlass or large butcher knife, but so carefully as not to trespass on the limits of the valuable leaf, barely taking them off. This operation is very necessary for the easy manipulation of the leaves in the field and at the machine. The leaves must now be made up in bundles—head and tail alternately—of 50 or 100, as the cultivator may think fit; this is necessary to count easily and rapidly on receiving from cutters and delivering to operators at the machine, all of whom are paid by the thousand; the bundle of 50 is, I think, more suitable, being of less weight, and the right one of about 75 lb. rendering it handy as well as giving ease to the cutters, cartmen and others, more so the first of these who have to carry it from the rows where cut to the interval.

A dray on good road carries 1,500 leaves at once to the works. Care must be taken to inspect the cutting or the cutter may, to suit himself, cut down green as

well as ripe leaves to avoid too much trouable and make a large profit in a short time.

I must at once take the opportunity of advising my readers as to their close application now. This is the time when if the plant is neglected and the leaves not cut it sends out the pole, the appearance of which, as you are already aware, sea's its doom to the sad loss of the cultivator who, after he is sensible of its value, will in no way relish it. Here begins the constant work which is justly so since there is no stoppage as crop goes on from one year's end to another. The proof of this is that a field or plantation started upon cutting at one end will, before the other end is reached, be ready to start over again, and this, too, whether rainy or dry weather; great attention is now required so as not to loose the leaves after cutting nor tho filament after extraction. At this time there ought to be a very large number of young shoots around the plants which may bo taken away to supply other fields.

CHAPTER VII.

MACHINERY, DRYING STAND, PRESS AND BUILDINGS.

To begin there must be on the spot or as near as possible a good and never failing supply of water for the use of the engine and otherwise. In the selection of the engine it of course depends on the number of acres in cultivation to form the calculation. If the plantation consists of 100 acres it requires an engine of 1 or $1\frac{1}{2}$ horse power to drive the fibre-extracting machine; one fibre machine is allowed to every hundred acres to be driven direct from the engine. There is no actual necessity of my describing the fibre extracting machine of Yucatan when we can have a superior one of modern style, which will suit the work splendidly, and I am sure turn out the fibre to better advantage, creating less waste. I will now give the details of the position, &c. Sufficient space must be allowed between the engine and the cleaning machine to admit of the reception of the leaves ou the stand which is fixed not faroff the machine, as well as to give room to the operators who take their position there. The machine, which is connected to the engino by meaus of a driving belt, is made to take a backward motion towards the engino and operators, which must necessarily be so in order that tho leaves on being inserted find their way downwards, the retuse or bagasse going under and emptying itself outside. The place where the machine is to be situated ought to have a certain elevation above the general level of the ground for facilitating the descent of the juice of the leaves and of the water which serves for the washing down, by means of natural or artificial declivities which conduct it to the deposits where it ought to be absorbed by the earth, or naturally evaporated by the action of the sun, from a neglect of which I have known many farms to present a disagreeable aspect all round. It is very important that the works be easily accessible to drays by having good roads, through which the work of carting in leaves, bringing in fuel, and carrying away the bagasse, &c., can be easily and quickly done, as on the good operation of these depend in great part the punctuality and exactness of a work like this, which requires the utmost persistence and entails loss in the least mismanagement, as well as for its choapness and the final out-turn of the business. The exposure of the building necessary to tho machine should not be treated with indifference; on it is dependandent that the operators be not disturbed by the direct embracing rays of the sun, and to avoid this it is best to make this building face the north as they will not be free from the sun, but the ventilation would be as perfect as possible; if not convenient to get it to face the north adopt in preference the east, so as to participate of the advantage enunciated, avoiding the south and west which would be insupportable for the operators in certain seasons of the year. It ought not to be lost sight of that the rule in Yucatan is that immediately after the day's work the fibre extracting machines are well washed and cleaned as the juice of the hemp fermented is corrosive for the iron, thus keeping them clean they will work better and last longer. On examining a fibre machine there, after a day's work, it will be found as bright as polished steel, tho effect of this caustic juice. The cleaning wheel of the machine used in that place is from 39 to 54 inches diameter; the last size is more used as it is calculated that the wheel of greater diameter cleans the large leaves with more facility, but on the other hand requires greater motive power for maintaining it in point of velocity which the cleaning demands. The number of revolutions in a cleaning wheel calculated thero is from 150 to 200 per minute at the least; if not so arranged the extraction of the fibre takes too long and is defective, in which case the combination of the engine and other wheels are reformed until the required velocity is obtained.

Drying Stand.—This is for the purpose of hanging out the fibre to dry in the sun and may be erected by putting up posts $3\frac{1}{2}$ or 4 feet high each at certain distances apart, and nailing small rails on top or against them or, if preferred, wire may be used instead, making sufficient stands as may be required under the circumstance; they can be put close enough as to merely allow of the attendants going between, and must be at no distance from the cleaning machine nor too far from the baling room, free from all shade and exposed in such a manner as to have the benefit of the sun at any hour.

The press is entitled to the next place; this is much needed so as to put in the smallest space possible a certain quantity of fibre for easy and cheap carriage and transmission.

Buildings.—The work can be carried on under one roof or in separate buildings as the planter chooses; the spaces required will bo for engine, cleaning machines, baling or press room, artificial drying room (the object of this is explained further on), and an open shed for the reception of the leaves from the field.—*Fiji Times.*

TEA IN 1890.

The violent fluctuations in exchange that accompanied the disturbance of the bullion market by the Windom Silver Bill have reduced commercial operations with the Far East, during the past year, very nearly to a gamble. With silver ranging from 44d to 54d an ounce, and the tael flying about like a shuttlecock between 4s 3d and 5s 3d, anything like sober calculation seems impossible. Yet 1890 will not, we believe, be remembered by China merchants as an altogether unsatisfactory year. Whether by good luck or good management, most things seem to have been "coming out." Certain classes of tea, for instance, have done well. Russian buyers failed to obtain all they wanted on the Hankow market, and completed their purchases in London at rates which gave a satisfactory profit to importers; common kinds have been in fair demand for "mixing" purposes, and the quality of the northern crop, at any rate, seems to have been on the whole better; so that dealers were less disposed to condemn China teas *in toto* as a doomed and depreciated quantity. With all this, however, the change in demand from Chinese to Indian produce has continued. The import of the former, which amounted to 93,000,000 lb. in 1888, having fallen to 83,000,000 lb. in 1889, and to 63,000,000 lb. for 1890; while Indian supplies rose from 73 to 74 and 79, and Ceylon from 20 to 28 and 40 millions respectively. The progress of the change is still better shown by certain statistics, recently published in our columns, giving the proportionate consumption in Great Britain, of China, India, and Ceylon tea, during each year of the thirteen from 1878 to 1890 inclusive. It will be sufficient for our purpose to reproduce here a few of the figures, to bring prominently out the ratio of change,

They are calculated to Nov. 30, and show the percentage of consumption of each kind of leaf.

	1878.	1881.	1884.	1887.	1890.
China ...	77	70	63	49	30
India ..	23	30	36	45	52
Ceylon ...	—	—	1	6	18

That there must be a limit to this decline very few will, we imagine, be found to deny. The reduction in stocks may indeed indicate that it has been approximately reached: for the falling-off in deliveries has not been commensurate with the decline in imports, and a decrease has consequently to be noted in the usual reserve. Many people still prefer China tea; many will drink no other, recognising in it a delicacy of flavour which neither India nor Ceylon can rival. But for the large majority, to whom economy is a prior consideration, the greater strength and flavour of the latter, and its capacity to go on throwing off highly-coloured liquid after several waterings, preclude any question of return to the old order of things. What is wanted—we cannot repeat it too often—is such an alleviation in China as shall give the grower, there, a chance of competing with his Indian rival. We have often pointed out that the increasing demand from Russia has compensated, so far, for the decline in England; but there has been a check, this year, even in that dispensation; and we decline to believe but that India and Ceylon will find a way of cutting into the Russian trade, also, if the Chinese Government persists in maintaining an export duty of nearer 30 than 5 per cent. *ad valorem*, and in allowing its provincial subordinates to pile on *lekin* in addition. —*L. & C. Express.*

NOTES ON PRODUCE AND FINANCE.

THE DUTY ON TEA IN AMERICA.—A telegram from Washington states that the Ways and Means Committee of the House has agreed to favourably report the Bill imposing 10 per cent duty on teas imported from countries which discriminate against the United States. The object of the Bill is to meet the discriminating duty levied by the Canadian Government on teas imported through the United States.

CHEAP TEA.—At a meeting of the Manchester Association of Wholesale Tea Dealers, the subject of inferior tea and unscrupulous advertisements came under discussion. One member thought the time had come when the tea-dealers of this country should warn the public against buying the shilling and one-and-sixpenny rubbish so extensively advertised as tea. The trade was doing itself an injury by quietly allowing such injurious rubbish to be retailed to the public, to say nothing of keeping down profits. It was urged that an effort should be made to show the public that it was really false economy to drink low-priced tea. The president said he thought it would not serve any useful purpose if the association issued a manifesto, for if he were a non-trader, and such a thing as deleterious matter in tea met his eye, he should feel inclined to give up drinking tea altogether. If any proposal were made as to the desirability of using good and genuine tea only, then he would favour such a proposal, but he was not disposed to sanction the publication of a manifesto. Ultimately the matter was referred to a sub-committee.—*H. and C. Mail.*

TEA CURING IN CHINA.

Those who are unacquainted with the method of curing tea in China may feel interested in the following extract from a paper on the subject read by M. H. Frandin, Secretary of the French Legation, at a meeting of the Oriental Society at Pekin. Mr. Frandin, after describing the difference between black and green tea, said:—A description of the manipulation to which the tea is subjected will show the green tea is only distinguished from black tea, by the fact that the green has not been torrefied, or dried by heat, in the same manner as the black. The leaves once gathered are spread in light layers on straw mats. They are exposed to the sun until they are withered. They are then put in bamboo trays, and are triturated by the feet. A part of the juice of the leaf escapes, and after this operation the leaves are exposed again, and again triturated and continually agitated. But the drying is still not complete. The drying is still continued in rattan cylinders, which are separated into two parts by a bamboo partition. Underneath the cylinder is a chafing dish of ignited charcoal. The leaves are thrown on the concavity of the separation, which is furnished with a cover. From time to time the cover is raised, and the agitation is continued. When the leaves are completely dried, the cultivator has finished his work.

The tea merchant then takes possession of the tea. He delivers the tea to women and children, who remove the stems of the leaves and the little wooden twigs which often remain attached to the young sprouts. For black teas the leaves thus cleaned are put again in the cylinders above described. They are again dried. There then gently crushed by the hand, and the operation of heating, or torrefaction, is repeated until all the leaves can pass through a series of holes of different dimensions. The tea is then thrown into a winnowing machine, which separates the heavy from the light leaves and removes the dust. The light leaves and the dust go to make "brick tea." The green teas are first dried in the shade and afterwards dried in the same cylinder, but of which the concave separation is made by a plate of metal. Their colour is preserved by means of indigo. It remains, then, only to make the mixture of teas of different localities. The teas are boxed and shipped all over the world. Teas of first quality are nearly always the product of the first gathering. Sometimes, however, the second is good. Teas exported from Hankow have the generic name of "congou tea." The best comes from Ningchow, but it is also furnished by Hu Kuang and Ho-nan. The best black teas of Fukien are designated by the generic name of "congou tea" and "souchong tea." They come from the districts of Tenmon, Kai-su, Seng Cheng, Cheng Lock, Fockon, Pan Yang, You-kai, Pack Long, Pack-linn. The mean value of the congou and the souchong of best quality is forty taels the picul. Inferior teas of these grades bring 7 taels the picul. Dust tea varies from 3 to 5 taels the picul. The boxes generally weigh 28·7 kilogs. The superior teas are chiefly bought by the Russians. They are sent to Moscow by land, through Mongolia and Siberia and are called caravan teas. But a great deal of tea is sent by sea to Odessa. In the struggle of the Chinese merchants with the teas of India and Ceylon they mix teas of different prices. The largest part of their consignments ought not to cost more than 20 to 25 cents a pound, delivered in the London market. Frauds are sometimes practised and leaves of other shrubs are mixed with the tea leaves.

The brick tea business is exclusively in Russian hands. The two places at which it is manufactured are Foochow and Hankow. There are three kinds of bricks—(1) the brick of black tea imported into Siberia and some other Russian provinces; (2) the brick of green tea, much sought by the nomad tribes of China and Central Asia; (3) the tablet of superior tea sent to Russia. The brick of black tea is made of the leaves of the second and third gatherings, which are generally over-mature. It contains the light leaves, the stems, the dust, the twigs and residue of the superior teas left over from former years. These substances are all reduced to powder and mixed together. The quantity necessary to make a brick is put into a piece of cloth. This piece of cloth is passed, with its contents, during several seconds in a jet of steam. Then this moist dust is put into a wooden mould which has been covered with a light layer of dry tea powder of better quality than the contents of the cloth, and then is pressed in a steam machine. The brick comes out of the mould as hard as rock. It is dried on planks during fifteen days, and then it is wrapped in paper, properly ticketed, and sent to its destination. Usually sixty bricks are in one package. Bricks are made of different qualities,

The harder the brick the better it is appreciated by the people of Central Asia. It requires an axe or hammer to break one of them. The green brick tea is made in like manner, but of green tea. Green brick tea is made larger than the black. All the brick teas replace money in business affairs in Central Asia. The Mongols divide a brick into thirty equal parts. Each part is called "cha-ra." A sheep, for example, is worth 120 cha-ra, that is to say, four bricks. A brick in Mongolia being worth 15 to 20 cents, a sheep in that wild country would be worth 45 to 60 cents. The Mongolians boil water in a pot of metal, using camel dung for fuel. They break off a portion of a brick and throw it into the pot with milk, butter, sheep fat, and salt. After a few minutes of ebullition, the beverage is ready. Tablets of green tea are made dry, by means of a hydraulic press, out of congou of good quality. A tablet is divided into eight equal portions, like chocolate tablets. It weighs 110 grams (a gram is 15·438 grains troy). Owing to the facility of transportation and its conservation of its aroma, the Russian Government uses it largely for its troops.—*H. & C. Mail*, Jan. 16.

RAINFALL IN KADUGANNAWA.

Mr. Wm. MacGregor of Gona Adika favours us with the rainfall, and writes:—The annexed memo. of rainfall for the Kadugannawa district during 1890 may interest some of your readers.

"A nice shower of rain fell last evening registering ·90, and it is raining today again. The tea bushes wanted it badly, ·75 registered this morning (5th).

MEMO.

	No. of days in each month of which rain fell.	Total rainfall.
1890—January ...	3 days	1·24
February ...	8 ,,	5·33
March ..	9 ,,	2·94
April ...	20 ,,	13·20
May ...	7 ,,	4·01
June ...	18 ,,	11·35
July ...	15 ,,	5·79
August ...	13 ,,	4·67
September ...	14 ,,	10·50
October ...	19 ,,	7·30
November ...	17 ,,	12·56
December ...	6 ,,	7·65
Totals	149 days	86·54

LIQUID GUTTA-PERCHA is made thus:—Gutta-percha in thin slices, 1 oz. chloroform, 8fl. oz.; carbonate of lead, in fine powder, 1 oz. Add the gutta-percha to 6fl. oz. of the chloroform in a stoppered bottle and shake them together frequently until the solution has been effected. Then add the carbonate of lead previously mixed with the remainder of the chloroform, and, having several times shaken the whole together, set the mixture aside and let it remain at rest until the insoluble matter has subsided. Lastly, decant the clear liquid, and keep it in a well-stoppered bottle.—*Indian Engineer.*

CINCHONA BARKS.—It is strange to see by the following extract from *Chemist and Druggist* that not only Ceylon but Java and Indian bark have, on the average, fallen off in richness last year:—The following figures denote the average percentage equivalent in sulphate of quinine of the principal cinchona barks of commerce during the last three years:—

	1890	1889	1888
Ceylon cinchona bark ...	2⅛ ...	2⅛ ...	2½
East Indian	2 ...	2 ...	2½
Java	4 ...	4⅛ ...	4
Calisaya cultivated ...	4½ ...	4½ ...	4½

The following are the unit prices (in pence per lb.) of cinchona bark in London on January 1st of the last seven years:—

1885	1886	1887	1888	1889	1890	1891
6 to 7	4½ to 5	3¼ to 3½	2¼ to 2½	1⅝ to 1¾	1¾ to 2	1⅜ to 1½

GALLE: CACAO.—It will be recollected that, a short time back, reference was made to the existence of cacao at Mapalagama, a little beyond Baddegama, where the trees were said by a correspondent to be of immense size and vigorous growth in spite of the dense jungle which surrounded them, and speculation was then rife as to who could possibly have introduced the product into the district. There can be no doubt that there are trees in the neighbourhood, the value of whose produce the natives have come to recognize to some extent, as a few days ago I am told quite a large number of pods were taken across the ferry, all more or less in an un ripe condition.—Local "Times."

THE REVIVAL OF COFFEE.—Liberian Coffee clearings in 1891. We learn that, in spite of the alleged failure of Liberian coffee in Kalutara, two estates are opening clearings of it this year, the proprietors being confident that, at current rates and owing to the improving prospects before coffee generally, it will turn out a remunerative cultivation. An experienced Kalutara planter recently expressed the opinion that in topping Liberian coffee in the same manner as we had been accustomed to do the Arabian variety we made a great mistake. In his opinion the Liberian is a forest tree, and if left untopped and planted on suitable soil, would yield excellent returns. We shall watch the experiment with great interest, more especially as several Uva planters have recently expressed the opinion that coffee there was showing signs of a distinct revival owing, doubtless, to the reduction in the area over which it is cultivated. We sincerely hope this may prove to be the case.—*Ibid.*

THE RETURN OF MR. DAVID REID, at this time, when the export of tea has reached such large dimensions, is rather noticeable seeing that he was amongst the first to take up its cultivation on any considerable scale in Ceylon. In this connection it may be of interest to recall the fact that the first estate opened by Messrs. Reid, Rutherford, and Mackay was Dewalakande, in the Kelani Valley. This block of land had been originally acquired by them for the purpose of cutting sleepers for the Nawalapitiya section of the line which they constructed, and much valuable timber was felled by them from it and carted up to the Ginigatenne Gap, and so on to Nawalapitiya for use as sleepers, etc. Not knowing what to do with the land, Mr. Reid was advised—by Mr. Jack Tyndall we believe—to plant it up with tea, and so nurseries were formed and the estate was opened. From this small beginning the large Company, which has since acquired so many valuable properties, grew; Mariawatte being afterwards laid down in tea. From that date these indefatigable pioneers of the new cultivation never slackened in their efforts to extend it, and how successful they were will always remain a record in our island's history.—*Ibid.*

A NEW FIBRE.—A new fibre plant has just been discovered that is claimed to be better than ramie. It is a native of the West Indies, having been found on the island of Trinidad. The great advantage possessed by this plant is that the ribbons at nearly all times of the year are easily despatched from the wooden portion by simply stripping them with the hand, and, therefore, a decorticating machine is not required as for ramie. When it is known how readily the stems allow themselves to be deprived of their coating of bark and fibre it will be seen what an advantage this simple fact gives the new product over many of the fibre-producing plants. All that is required is to cut the stems, which are fully ten feet long, split the bark at the larger end, and strip off the bark from end to end without stopping, as fortunately the stems have no side branches. Samples submitted to London brokers were most favourably reported on, and were valued at from £17 to £20 per ton. It is thought that ramie will probably be beaten by this new fibre, when cultivators fully realise the greater ease and consequent less expense with which it can be decorticated.—*India Rubber Journal.*

Correspondence.

To the Editor.

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, Jan. 12th.

Dear Sir,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 22nd December 1890.

Exports of Indian Tea From Calcutta.

	1890 lb.	1889 lb.	1888 lb.
Exports to Great Britain in Dec.	14,156,971	11,811,301	11,801,612
Exports to Great Britain from 1st May to 31st Dec.	84,428,563	79,935,589	79,340,409
Exports to Australia and New Zealand in Dec. ...	765,156	459,226	369,355
Exports to Australia and New Zealand from 1st May to 31st Dec. ...	4,233,168	2,837,075	2,397,100
Exports to America in Dec.	34,158	16,640	23,619
Exports to America from 1st May to 31st Dec. ...	116,040	142,190	92,644
Exports to other places in Dec.	61,250	74,022	31,244
Exports to other places from 1st May to 31st Dec.	815,158	1,270,773	635,003
Total Exports from 1st May to 31st Dec. ...	89,592,929	84,185,627	82,465,156

—Yours faithfully, S. E. J. CLARKE, Secretary.

ARTIFICIAL COMBS FOR CEYLON BEES.

Glasgow, January 14th.

Dear Sir,—I have read with interest in the *Overland Observer* of the 13th Nov. last an article on "Artificial Combs for Ceylon Bees."*

The artificial comb (or comb foundation as it is called) is made of a thin sheet of wax upon which the forms of the cells are impressed, and when first given to the bees it is not ready for the storage of honey. The bees have first to draw out the sides of the cells until they (the cells) are of the usual depth. This, of course, is a great saving of labour to the bees, as the manufacture of wax consumes much of their time and strength.

I do not know anything of the species or habits of Ceylon bees, but unless they differ considerably from those of the bees commonly used in England, (the common black, Ligurian, Cyprian Carniolan, &c.) I fear that, as a method of attracting bees, the hanging of combs in the vicinity of bungalows would not be attended with success.

Supposing that the habits of the Ceylon bees are similar to those of the English they will swarm at a certain time of the year. (In England it is generally in May or June.) The swarm should then be taken and placed in a hive previously fitted up with comb foundation, which the bees would speedily draw out and then commence work in the usual manner.

From your Directory I see that Ceylon "has several useful indigenous bees," and I should be interested by any information regarding the habits and species of these bees and if any have been domesticated or kept in hives.—Yours, &c.,

APIS.

[We shall send our correspondent some of the back numbers of our *Tropical Agriculturist* with information about bees.—Ed. *T. A.*]

* See page 653.—Ed. *T. A.*

CACAO CULTIVATION AND CRITICS.

Galagedara, January 21st.

Sir,—My attention has been drawn to a letter signed "1873" headed "Planting Notes for 1891" appearing in your paper of 10th inst.*

Under the heading "Cacao" your correspondent, who evidently has got to the bottom of most things, teaches the Galagedara planters *how to do it*.

There is an old and somewhat musty saying—"First catch your hare, then cook him."

Your correspondent tells us, first, how to grow cacao, and *make it crop* (a secret your t'otherest correspondent "Eldorado" appears not to have found out), and then proceeds to tell us how to catch, and afterwards cook, the wretches who steal our crops. Now, sir, it is all very well for "1873" to write to your paper, but I have one or two questions I should like to put to him through you:—

1st. Is it not a fact that he was the manager of the estate quoted by him as losing 50 per cent of its crops, owing to the depredations of thieves, for some time before the "easy-going office man" came out from England to take charge?

2nd. Did not the aforesaid "easy-going office man" oust "1873" for reasons best known to "1873" and the "e.-g. o. m."?

3rd. Will "1873" state precisely what his experience has been in this country, with regard to planting cacao and shade: *i.e.* how many acres of cacao has he planted, and what return did he get, when his cacao came into bearing?

4th. Did he ever hear a thief on the Galagedara side, say of "such a one" (the English is "1873" 's not mine) "Don't rob that master, he is kind, is friendly with the headman, unmerciful when he catches us, and relentless in hunting us down. Let us go over to —," and so on?

5th. And, if he never heard a thief say this, (as of course he never did) why does he write such stuff?

I leave abler pens than mine to deal with "1873" 's strictures on coffee and tea growing; and enclosing my card, am, sir, your obedient servant, GALAGEDARA CACAO.

DANDELION.

Pussellawa, Jan. 26th.

Dear Sir,—Can you or any of your many readers inform me, if the dandelion plant can be got, and grown in Ceylon? I am anxious to try it, as it makes a very good salad.—Yours faithfully, UPPER NILAMBE.

[The plant is allied to chicory. We have not heard of its being grown in Ceylon, but we do not see why it should not be successfully cultivated in our hill regions.—Ed. *T. A.*]

COCONUTS:—A FREAK OF NATURE.

Dear Sir,—Herewith a bunch of coconuts with three fruits, two of which you will find are like the king-coconuts, while the other is quite green, all in the same cluster and from a tree about 40 years old which hitherto never had anything but green-colored nuts, and have about four clusters at present all green-colored. One nut you will note is small; this I believe is attributable to rats making an attempt when the fruit was tender to eat it. There were two other green-

* See pages 569 and 593.—Ed. *T. A.*

coloured nuts on same cluster which unfortunately were destroyed by rats at their early stage. D.

[The cluster of nuts which are a curiosity can be seen at our office.—ED, *T. A.*]

POULTRY DISEASE: A REMEDY WANTED.

DEAR SIR,—Can you or any of your correspondents gives me some information as to the treatment of a disease which has appeared amongst my poultry? It may be described as follows:—Lumps all over the head, which increase in size until the bird is blinded by them when, of course, it dies of starvation. Some chicks were first carried off, and then it attacked and slew several promising young turkeys. Any advice as to the treatment of the disease will be most gratefully received by a

DISCOURAGED HOUSEWIFE.

[This is no doubt the disease, so fatal to turkeys, regarding which we had several letters a year or so ago. Segregation and fumigation with sulphur or tar should be tried.—ED. *T. A.*]

DANDELION.

Peradeniya, Feb. 2nd.

SIR,—Your correspondent "Upper Nilambe" can obtain dandelion plants from Hakgala gardens on application. We obtained seed from N. India in 1882, and in my annual reports for that and the succeeding year, will be found, under the heading "Taraxacum," a full account of its progress as a cultivation. The roots do not become very large in our poor soil; but the plant has already escaped from the garden and commenced to establish itself as a wild plant. I observed last September a large colony of it by the side of the Badulla road a little below Hakgala, and it will doubtless in time become a common weed in our high districts as it has already in the Nilgiris.—Yours faithfully, HENRY TRIMEN.

OUR JUNGLE TREES AND OTHER PRODUCTS.

DEAR SIR,—Has it never occurred to you while walking through the jungles here, that during almost every month different kinds of seeds are to be found, and, how few planters can tell the names of the trees their seeds came from? These reflections have often led me to wish for some pamphlet or booklet on the subject; and I think, now that the Ceylon Government have so able a staff of Forest Officers, it might undertake the publication of a work in colored illustrations full size of the fruits so far as practicable, and of the seeds of the various useful trees now to be found in our jungles. Such a work ought to have a ready sale in Ceylon, but apart from that, it would be an immense boon to the European and English-speaking natives of the country. In addition to a description of the seed or fruit, there ought to be a short description of the leaves, bark, color of the wood and its uses.

How many planters in Ceylon have been deceived by rascally sawyers and shingle contractors? Is it not the case that many planters must trust to their carpenters' honesty or knowledge of the timber required for building or shingling purposes, and they are scarcely to be blamed if they have no means of acquiring the information, hence I think a booklet of the kind I refer to is much wanted. To give only one instance. The roof of a bungalow scarcely three years shingled with shingles said to be from one tree, is now in such a state of dry rot, that many of the shingles can be broken between finger and thumb like shortbread. The superintendent trusted to his carpenter's knowledge of suitable wood, as the best known shingle trees were perhaps not so plentiful as in the earlier coffee days.—Yours truly, AN OLD PLANTER.

["Old Planter" is making a rather large order all at once on the Forest Department: what is first wanted is a thoroughly reliable Guide to the various Timber Trees and their native names. For this want, the late Mr. Wm. Ferguson's pamphlet deserves to be reprinted; but from Dr. Trimen's list, as now available, "Old Planter" might learn a good deal. Many Sinhalese can tell him their name for the tree on which any fruit or seed produced, grow and then by referring to the index, he would be able to get the Botanical name. Still there is no doubt that later on we may well look to the Government and their Forest Department for a useful Guide to our jungle trees and products.—ED. *T. A.*]

RAINFALL IN KADUGANNAWA.

At the Gate of the Central Province, Feb. 7th.

DEAR MR. EDITOR,—I for one was interested in Mr. Wm. Macgregor's memo. of rainfall * at the Gampola end of Kadugannawa. I thought that the Bukanda hill would have attracted more rain than it appears to have done. Situated as I am in the centre of the district, I often envy my neighbours at Allagalla and Gona Adika, because the rain clouds seem generally to discharge themselves at the extremes of the district, leaving me to mourn over disappointed hopes. I also annex a memo. of rainfall, which may be of interest to someone, should you think proper to print it. I only commenced to keep a register from the middle of 1887, but the six months of that year show what ought to have been a heavy rainfall for the year.

The old district, so favorably known in the days of coffee, is being rapidly opened up for tea, and will yet come to the front. This is undoubtedly the elevation for indigenous tea, and it goes on flushing when all other jâts shut up. There was some talk about Government opening up the roads from this to Gampola, but if they are not quick about it, they will have a difficulty in finding it when they do commence.

Kadugannawa village is fairly healthy, but I am surprised it is so, for the drainage and smells are abominable. If the Government Agent came oftener it would be a blessing. He was here the other day, and in anticipation of his visit huts were whitewashed, drains cleansed, and dirt put out of sight. When I saw the change in the aspect of affairs, I began to think that the Cesarevitch, at least, was to honor us with his august presence. We want a police station badly, and a responsible man to look after the sanitation of the place. The villagers on all sides are a lawless lot, and a fine field there is here within a radius of 4 or 5 miles, for the Salvation Army to work in, but they prefer to have a meeting occasionally for the English-speaking population, and the big drum is regularly beaten in the street to the great delectation of the little boys. Excuse these disjointed notes.—Yours truly, KADUGANNAWA.

MEMO OF RAINFALL.

	Days.	1887 inches	Days.	1888 inches.	Days.	1889 inches.	Days.	1890 inches.
Jan.	...	...	...	...	...	...	6	5·34
Feb.	...	...	2	·37	...	...	6	4·65
March	...	...	6	2·21	15	10.14	6	1·70
April	...	...	7	4 85	22	12.34	19	6·87
May	...	...	11	6·31	19	10.74	8	4·14
June	...	...	20	15·92	18	3.91	15	11·88
July	...	4.22	10	1·91	24	10·54	17	9·01
Aug.	16	5·91	16	3·69	15	8·15	16	5·05
Sept.	15	3·25	14	3·70	17	9·31	13	10·52
Oct.	22	18·47	24	18·18	11	6·97	20	9·83
Nov.	23	12·89	18	5·22	10	7·60	13	7·81
Dec.	20	16·45	19	8 30	7	2·08	9	6·09
Total ...	107	61·19	138	70·66	158	81·78	148	82·89

* See page 649.—ED. *T. A.*

DECREASING RAINFALL IN MASKELIYA: THE DRY CYCLE?

Deeside, Maskeliya, Feb. 9th.

DEAR SIR,—The rainfall on Laxapana for last year, (see page 621) as against previous average, took you evidently by surprise; but I fancy the rain deposit is greatly decreasing all over the district. On this estate a nine years' average 1874-1882 gives 137 06 inches with a maximum fall in 1877 of 183·83 in. and a minimum in 1875 of 119 55 in. The record of rainfall was continued to end of July 1883 and shows for the 7 months 88 00 in. After that the record ceases until end of 1889, and the 1890 complete record gives a total of 89 92 in, or 47·14 below the 9 years' average and 29 63 below the minimum of the 9 years and no less than 93 91 below maximum of that period.—Yours truly,

WM. MITCHELL.

P.S.—I fear your idea of the gauge being in different positions won't hold "*water.*"

CENTRAL AFRICA COOKERY.—As a rule, only one principal meal is eaten in Central Africa, in the early part of the evening. It usually consists of parrot soup, roasted or stewed monkeys, alligator eggs (also well liked by Europeans), and birds of every description. They also have moambo, or palm chops, and fish. A great delicacy, so considered by Europeans and natives alike, is elephant's feet and trunk. These have somewhat the taste of veal. To prepare them, the natives dig a hole about five feet deep in the sand and in it build a large fire. After the sand is thoroughly heated the fire is removed, leaving only the ashes in the hole. The trunk and feet are placed in this hole and covered with leaves, and afterward with hot sand. In two hours they are done. All carcasses of animals which are to be cooked are placed on a block of wood and pounded until every bone is broken, care being taken not to tear or bruise the skin. They are then boiled or roasted on an open wood fire or in hot sand or ashes, without removing the hide or feathers. The cooking is of a very inferior grade, the only spices used being salt and pepper. The kitchen untensils consist of common earthen or wooden ware. Very little time is taken for setting or decorating the table; knives, forks, and napkins are dispensed with. Africans have several vegetables well liked by Europeans. N'gutti-u'sengo is a dish eaten all over Africa. It consists of egg-plant, small fish somewhat like our sardine, and the roots of the cassava or manioca plant (called n'gutti), which have a knotty appearance and often weigh as much as twenty pounds. As the latter contains poison, the manioca is soaked in water for three or four days to extract the poisonous substance. It is then cut and sliced, and small tomatoes are added. All is placed in a vessel with water, and seasoned with salt and pepper, and boiled. Moabo, or, as the Europeans call it palm chops, is also a favorite dish. The palm nuts are first boiled in water, until the pulpy substance loosens from the pit, then the shell, which contains a very delicious oil, is placed in a wooden mortar and crushed to obtain the oil. Whatever the meal consists of—meat, fish, mussels—is put in a vessel, adding the oil and the pulpy part of the palm nut, also red pepper and salt, and is boiled. Roast or boiled squash (loenge) is generally eaten with it. Sweet potatoes (m'balla benga) are more farinaceous and sweeter than ours, but do not taste so good. They are boiled or roasted. Bananas (bitaobo) weigh about half a pound each and are about fifteen inches long. When half ripe they are cut in slices and boiled in water with salt and pepper. N'sinsi is a little red bean, which is boiled in water without salt or pepper, and is freely eaten For peanut bread (chisula) the peanuts are first roasted and then crushed. This mass is then rolled and put into the skin of a banana, adding a little pressure, forming it into a body. It readily retains this shape from the pressure of the oily substance in the peanut.—*New York World.*

THE FOREST IN DEHIGAMA'S CLAIM is about 5,000 acres and there are 4,000 acres of patana which would grow very good tea indeed I should think. The total amount is only 12,000 acres and really the fuss made about it is out of all proportions to what it is—many a larger claim has been admitted to natives, but they oppose simply because Europeans have got it.—*Cor.*

EXTENSION OF TEA CULTIVATION IN HAPUTALE.—Mr. Lipton, the proprietor of the estates known as the Dambetenne group, is rapidly extending the cultivation of tea on his places. Nearly 200 acres of forest on Dambetenne and Monerankande estates are to be felled and cleared and tea planted on them during this year.—A new tea factory is to be built on Meriabedde estate, of which Mr. E. H. de Winton is superintendent.—*Cor.*

IN THE NORTHERN TERRITORY the only thing which was found to keep the white ant pest in check was a mixture of flour, sugar, and arsenic, mixed to the consistency of putty with water. A small piece of the mixture should be placed wherever the nest is known to exist. If an examination is made a few days after using this remedy thousands of dead ants will be discovered in the vicinity of the poison.—*Mildura Irrigationist*, Jan. 7th.

CEYLON TEA AT HOME.—Some time back I mentioned that a firm of Mincing Lane Tea retailers were arranging for stumping the country in the interests of Ceylon tea. The campaign is opened, and on Wednesday night Mr. C. S. Hicks appeared on the platform at the People's Palace and delivered a lecture, illustrated with a large number of lime light views of Ceylon. Mr. Hicks is well known to the habitues of the Lane as the proprietor of the "Dalukola" tea which is, I believe, packed in Colombo by Messrs. Leechman & Co. Another new agency for the distribution of Ceylon tea, has appeared on the scene under the title of the Agra Ceylon Tea Association. This association "guarantees that all its teas are exclusively derived from the four celebrated tea gardens on the estates in the Island of Ceylon, belonging to Mr. H. R. Farquharson, M. P." Numerous branches are said to be in the course of being started and a shop has been already opened in Middle Street, Yeovil. Good luck to Mr. Farquharson and his tea shops!—London *Cor.*

THE DAIRYING INDUSTRY OF VICTORIA has a special interest to us in Ceylon, since if we only could get supplied with butter and cheese, as well as fruit and other produce from the Southern Colonies, the inducement to take off larger quantities of our teas would be greatly increased. Mr. Deakin handed us a paper with a Report on the Victorian Dairying Industry and we quote to show the enormous quantities of butter which passes our door to the United Kingdom. Not only Ceylon but a great part of India might be supplied by shipments through Colombo. We quote as follows:—

I also submit report of the shipment of this seasons surplus butter to England, consisting of 10 shipments. The shipments began with the steamer "Victoria," which sailed on 11th Oct., and the last was by the S. S. "Massilia" on the 17th Jan. The Orient Company's steamers took the remainder every fortnight between these dates. The department gathered it at the refrigerating works, Newport, from all parts of the colony, to be frozen or chilled in terms of the company's regulations previous to shipment. The total quantity sent is 731 tons—nearly double what we considered an enormous export last season, consisting of 21,954 56 lb cases and 17,827 70 lb. kegs. The merchants supplied fully a third of this large quantity with what is known in the trade as "mixed butters." Farmers' small lots arriving weekly in a glutted market are bought up, resalted and packed, and where this is done with skill before the butter is stale a fair article is produced. From news to hand of five shipments, we learn that £5 10s and up to £5 16s per cwt., has been obtained. This must be very satisfactory to producers

"APIARIAN":

ARTIFICIAL COMBS FOR CEYLON BEES?

It is marvellous in how many ways the advance and application of science touch industries even the most primitive all over the world. The suggestion we make today (Nov. 5, 1890.) is to take advantage of modern scientific advance in the method of collecting the honey of the wild bees which so musically fill the vast forests of our inland districts with their continuous humming. Our attention has been called to this subject by one who tells us how struck he has been by the large advance made in the quantity of honey exported from Italy since the introduction and use of artificial combs. We believe that it has long been a subject of complaint that many—perhaps the greater part—of our forest fires are due to the means employed by the native bee-hunters to secure the object of their quest. As each year demonstrates to us the necessity for careful Forest Conservation, this particular point becomes one of much importance, and it is one that Colonel Clarke and his Deputies will have carefully to consider and, if possible, deal with. Every traveller through our jungles is pretty sure to come upon one or more trees during the course of his day's journey which have been manifestly destroyed by fire, and it has simply been a fortunate chance, due generally to weather conditions at the time of ignition, that a case of isolated destruction has failed to initiate a far-reaching conflagration. Although along many frequented lines of travel such burned trees have mostly been lighted by the fires of passers-by carelessly placed, those so often met with in the inner recesses of the forests have as a rule been destroyed by the efforts of the bee-hunters to smoke out their intended victims.

We are told that nearly all the honey now consumed in England is derived from artificial combs, in which it is largely imported from the Continent of Europe. It would, therefore, certainly appear that a useful industry might be developed by offering to the Ceylon bee, which provides us with such exquisitely delicate honey, an opportunity for storing his hoards without incurring the preliminary labour of constructing his "safe deposit" cells. The Italian bee, with the keen instinct of his kind, has almost abandoned the labour of cell-making. Directly he lights upon the artificial object, attracted to it by a bait of a dab or two of honey, he recognises the luxurious provision and straightway sets to work storing his honey, and produces,—owing to this saving of his preliminary labour,—more than twice the quantity he could before overtake. We should think that the men who follow the very laborious and risky occupation of bee hunters in Ceylon would gladly see around their huts the millions of bees which, if tempted at the proper season, would swarm to the artificial combs provided for them. We have described the occupation of these men as a risky one. It is essentially so. It is rare in the remoter bee districts to see a hunter free from scars—the result of his combats with the bears who share with himself a strong desire to secure wild honey. From such contests the comparative domesticating of the wild bees would free the hunter, and his harvest would be a fuller one, be gathered with infinitely less of labour and exposure, and with more of certainty. There is one thing, perhaps, to be said which might negative the advantages we have pointed out, and that is that the production of bees-wax would be lessened by the use of artificial combs. What proportion of value exists between the honey and the wax yielded by a certain weight of comb we do not know, but we should presume the value of the honey must largely preponderate. Meantime, to make a beginning in the experiment, some useful result might follow if one or more of our Assistant Government Agents resident in the bee districts would procure and hang some artificial combs around their bungalows. They would soon have many pleasant neighbours in their comparative solitude, and success might lead to a very wide and paying adoption of their novel devices.

THE ACTION OF LIME ON CLAY SOILS.

That lime promotes the fertility of heavy clay soils is a fact that has for many generations been well known to all agriculturists; but the scientific reason for the beneficial action arising from its application has not, to the best of my belief, been at any time at all satisfactorily explained. The question, however, remains one of first importance in the science of soils and I therefore make no apology for offering an explanation, or rather theory, which, to my doubtless, somewhat partial mind, seems to go a considerable way towards the elucidation of the problem.

I take it for granted that all interested know that a clay soil is not by any means a pure clay (hydrated silicate of alumina), but a mixture of *impure* with pure clay (much more of the former than of the latter), plus sand, iron oxides, organic matter, &c. The clays which form its bulk have been derived from the natural decay or weathering of mineral silicates, containing, besides, aluminium, alkali, or alkaline-earth metals, and they occur in it in all stages of impurity or further decomposition. As an invariable rule, other things being equal, the greater the normal impurity of the clays the greater the fertility of the soil. A *pure* piece of clay is like pure quartz-sand—so much dead, inert matter; a plant can make nothing of it, can take nothing from it. In no fertile clay soil, however, even of the heaviest description, does there occur at any time more than about 10 per cent. of *absolutely* pure clay. Well, then, what is the composition of the average clay particle? That depends on the mineral from which it was derived. If from the felspars, its most common origin, it will be a hydrated silicate of alumina plus silicate of potash, or, instead of the potash, soda and lime. I will suppose, for brevity's sake, that my clay particles have the former composition, and the explanation which I will offer with regard to their behaviour can be applied with very little difficulty to any of the other cases. Clay particles of the above composition, when subjected to the action of water containing carbonic acid gas, lose potash. That I have repeatedly proved by experiment. If the carbonic acid is in fair excess, it comes away altogether as carbonate of potash; but if there is not a sufficiency of this anhydride, it is liberated partly as soluble silicate of potash (soluble glass). Should lime, however, in this latter case be present, the practically insoluble calcium silicate will be constituted, and the potash freed to form a soluble salt with any other acid that may be present and available, such as carbonic, sulphur, nitric, &c. A grass plant gowing in clay soil does not, it is evident, send sufficient carbonic acid through its root-hairs into the soil, as many other plants do, to completely convert the liberated potash into carbonate, and the consequence is that the soluble silicate of potash which is permitted to form is drawn into the vegetable, as well as the carbonate of that alkali. Now silica and silicates are decidedly injurious, to all vegetables doubtless, but particularly to agricultural plants. I say injuriousu; the day has gone by for considering silica an essential, or useful, or even a merely innoxious accessory. A little examination of the plant-physiology shows that it is injurious. The organism tries to get rid of it as speedily as possible—that is, at least to get it out of the way of its general circulation; it unfortunately has no means of casting it off altogether. Here, I need scarcely refer to the well-known experiments which have, over and over again, conclusively shown that the grass plant does not require silica as a supporting or strengthening material. Now we come to see the use of lime in the clay soil, especially in the case of the cultivation of cereals and pastoral grasses. The lime added and mixed up with the soil acts on the soluble silicate of potash as it is formed, and combines with the silica, constituting, as I have already remarked, the practically insoluble silicate of lime, which, of course, being normally indissolvable in the soil, cannot pass into the body of the plant. Therefore, the organism profits by its exclusion, and as a consequence so does the farmer. The energies of the plant are not spent in getting rid of silica if there is

no silica to get rid of, and its ordinary processes of nutrition can progress uninterruptedly.

The breaking up of the soluble silicate* could be as well accomplished by the perfect aëration of the soil so that every particle could be constantly exposed to fresh portions of aërial carbonic acid and oxygen: and this is one great reason why fine deep tillage, where it is possible, so improves clayey soils, but of course a tillage that will bring about the perfect aëration of heavy clay, is all but impossible; therefore the advantage of judiciously using lime.

The soluble alkaline silicate which, when undecomposed, passes into the plant in the water-stream through the roots, is evidently very soon split up by the vegetable, and the silica combined with some substance, such as an aldehyde, and carried on in solution in this state to the peripheries of the stem, &c., where, by the process of practically unrestrained evaporation, the compound is again split up, the aldehyde going off into the air, and the solid silica remaining stranded in the cuticle and the other walls, or occasionally even in the cavities of the epidermal layer.

The silicate of lime formed in the above reaction itself ultimately undergoes decomposition by natural water containing carbonic acid, but the decomposition is always complete; it devolves entirely into carbonate of lime and free insoluble silica.—Alexander Johnstone, Edinburgh University.—*Nature.*

* Only the alkali metals, of which potassium and sodium are the only two that normally occur in soils, from silicates soluble in water.

COFFEE CULTIVATION IN SOUTH AMERICA:

A Syndicate Organised to Explore the Eastern Slopes of the Andes.

This mail brought us a letter from an ex-Ceylon planting friend announcing that there was a project on foot in London to send out an exploring or pioneering party to Peru with reference to taking up land suitable for coffee. The great prospective scarcity of this article—prices even now approximate to 140s a cwt.—forms the special inducement or this mission. Its inception seems to be due to men of high commercial standing in "the City" and among the supporters named to us are Sir Alfred Dent and Sir Hugh Low. So much for the mail news contained in our private letter; but a new and more practical interest is given to the scheme by the fact that the London Syndicate have telegraphed out to Ceylon to get the services of Mr. P. D. Clarke of Dr. Trimen's staff, to join the exploring party. Mr. Clarke who is a son of a well-known Curator of the Glasgow Botanic Gardens, has now been 11 years in Ceylon, giving faithful though unobtrusive service for all that period without any leave of absence, in our Royal Botanic Gardens. Under these circumstances, the Government could scarcely do otherwise than grant the leave of absence required to enable Mr. Clarke to discharge the temporary duty now required of him. He gets leave for nine months and goes to London by the Orient steamer "Cuzco" tonight. The expedition so far as Mr. Clarke knows is bound for the Eastern slopes of the Andes near, curiously enough, to the town of Cuzco and no doubt advantage is to be taken of the trans-Andean railway to make the West coast the outlet of such plantations as may be established. The only other member of the Expedition so far as Mr. Clarke knows is Mr. J. L. Shand and "coffee" culture is the main, if not the only object in view. No doubt the duty of Messrs. Shand, Clarke and their colleagues will be to report on the fitness of available land for plantations, on the climate, soil, means of access, labour, &c. Possibly, if all go well, nurseries may at once be established and clearings be commenced. With Sir Alfred Dent on the Syndicate, we should suppose there may be an idea of importing Chinese as labourers.

In Ceylon, Mr. Clarke in a quiet way has been giving a good deal of attention to coffee. He strongly shares our opinion that planters of Liberian coffee some ten years ago were in far too great a hurry to give up the cultivation. His own experience last year on half-an-acre planted with Liberian coffee at Peradeniya is worth giving: it is that he netted R222·62 from the crop off half an acre. Allowing for special attention to the trees, there is margin enough here surely to encourage any one to go in for Liberian Coffee on suitable areas of soil in Ceylon.

Meantime we hope to have interesting intelligence of the doings of the Trans-Andean Coffee Expedition of 1891, and we wish the party all success.

COCONUT CULTIVATION IN THE INTERIOR OF THE WESTERN PROVINCE

1890.—The coconut crop of the district has been an average, and the price of copra has kept well up, so that, on the whole, proprietors with mature estates have nothing to complain of; but the deficient rainfall from May to October will tell against the outturn of 1891. That is the season of the heaviest gatherings, and the rainfall at that season regulates the crops of the corresponding months of the following year to a great extent.

Towards the end of the year, leaf disease reappeared, but not nearly to the same extent as two years ago. In some few cases the same trees are affected as suffered then, but not all, and some fresh cases, nothing of any consequence, however. I believe it to be the result of drought on stiff soils that too easily yield up their moisture.

1891 has opened well in the way of rainfall, January having given 3·14 inches and it is thundering all round while I write. W. B. L.

Planting in Guatemala.—We learn that Mr. W. J. Forsyth, formerly of Maturata, is getting on well as manager of extensive coffee and cinchona plantations in Central America. Labour is the chief difficulty. We hope to have a letter erelong, bringing up Mr. Forsyth's experience from the date of his last communication.

A Thirty-five Years' Cycle of wet and dry periods alternately has just been worked out by Herr Bruchen, who shows that,—

In Western Europe and Eastern North America the wet period, he shows, gives from a sixth to a fifth more rain than the dry period. In Siberia and the Far West of North America they give a third to a half more rain. Since 1870 the world has, in his opinion, been passing through one of the wet periods, which has produced bad harvests on the seaboards but greater fertility in the middle parts of the continents. During the first 20 years of the next century he expects another dry period to come, having an annual humidity of from 15 to 20 per cent. less than at present. Herr Brüchner also endeavors to show that the great general migrations of mankind are and have been connected with these periods.

But in the tropics and Ceylon especially, Herr Bruchen would find eleven year cycles nearer the mark for the alternations.

A MINCING LANE SALE ROOM.

The *Daily Graphic* gives an engraving entitled

The Tea Trade: Business brisk at Mincing Lane Sale Rooms yesterday:

"Capel" is in the box. A sample of "the precious stuff" appears on high, and in the foreground is a separate engraving of

Mr. J. Hillyard the dealer who bought the famous sample of Golden Tip.

The letterpress is as follows:—

There is an old story afloat of a Stock Exchange "plunger" who, finding things dull in Capel Court, and hearing of big operations in Mincing Lane, got a "tip" in pepper. Visiting the sale rooms and inspecting the samples, he is said to have given an order for "1,000 tons" of his selection. The remarks of the broker are not recorded. Though dealings are, it need hardly be said, not quite on this colossal scale, there is plenty of excitement to be had in the various produce markets which centre in the Commercial Sale Rooms. The sale of a consignment of tea last week at the astonishing price of 107s. per pound has attracted a good deal of attention to these markets, and revealed interesting possibilities of business and profits of which little is generally known.

Mincing Lane is not as exclusive as the Stock Exchange, and the general public are admitted to the sale rooms if accompanied by a member. On the ground floor is a large hall with a few circular seats surrounding the iron columns of the building. Boards on the walls for quotations and telegrams complete the furnishing, and at one end of the room at a lower level is a spacious refreshment room and bar. Tea seems the favourite beverage in the afternoon, as befits the locality.

The sale rooms, of which there are several, with distinctive numbers, are on the upper floor. Each is fitted with a rostrum, and the desks and seats ranged in a semi-circle and sloping upwards afford an uninterrupted view for all members presented. Catalogues are printed for each sale, but the samples which have been offered for inspection and tasting—in the case of tea—previously are not shown at the time of dealing. The noise and excitement during the bidding far exceed the ordinary notions of sales such as are gleaned from a visit to Christie's or other auction rooms A strong dash of the betting ring seem to be here infused, and the eagerness of the bids is accounted for by the large amounts at stake. The presiding genius in our sketch is Mr. Capel, of Messrs. Arthur Capel and Co., known as the Father of the Tea Trade, and among the other members several of the leading *habitues* of the rooms will be recognised.

With reference to the special consignment of tea which has created so much interest, we learn that it was comprised in boxes of 5 lb. each consigned to this market from the Gallebodde Estate, Ceylon. Great care had been expended in its production, and the price at which it was knocked down yielded, it appears, a profit to the purchaser, who succeeded in reselling it in the course of the day £5 10s per pound. It is calculated that this represents a cost to the consumer of 1s 7d per cup, which would not be an out-of-the-way price for many descriptions of wine.

CEYLON TEA AT 110s.

Tea at one hundred and ten shillings a pound! It appears that on Tuesday last a consignment of Ceylon tea of superb quality was put up for sale in the City of London, which experts pronounced to be the finest article of the kind ever offered under the hammer. The competition for this unique specimen was so keen that the greatest excitement was occasioned by it, and the lot was at last knocked down at eighty-seven shillings per pound—a figure which during the present century had never been approached in the annals of the tea trade in this or any other country. A letter which appeared yesterday from Messrs. Whitworth, Hillyard, and Wade states, however that they were the purchasers at auction of this marvellous consignment, for which they gave eighty-seven shillings a pound, and that they have since resold it at one hundred and ten shillings—at which figure its cost to the consumer would be about one shilling and sevenpence a cup. Untiring care and attention must undoubtedly have been bestowed on its growth and preparation in the Gallebodde district of Ceylon, as the leaves are of the brightest golden colour, almost resembling small lance-shaped pieces of the precious metal. We wonder what Dr. Johnson would have thought of serious business men who, at the end of the nineteenth century, would consent to purchase at the fancy price of five pounds ten shillings per pound that leaf which when infused with hot water he loved so well to drink! There is nothing more astonishing than the rapid growth in the consumption of tea by the population of these islands. In 1840, for instance, the tea imported into this country amounted to thirty-eight million pounds, while thirty years later it it had grown to one hundred and forty-one millions, and last year it reached nearly one hundred and ninety millions. While our lively neighbours across the Channel and our kinsfolk on the other side of the Atlantic clamour for coffee as the only non-alcoholic beverage which is worth drinking, and denounce tea as "cat-lap" fit only for invalids, the teapot becomes annually more and more of a British institution.

It was one of the best and most sagacious provisions made by Mr. Disraeli in his unfortunate Budget of 1852, which brought Lord Derby's first Administration to a disastrous close, that he suggested a large reduction in the tea duty. On accepting office as Chancellor of the Exchequer Mr. Disraeli found the tea duty at two shillings and twopence farthing in the pound, which he proposed to reduce to one shilling and tenpence. Upon succeeding to the Exchequer Mr. Gladstone accepted his predecessor's proposal, remarking in 1853 that he would have gladly reduced the duty by a shilling but for the condition of the Chinese Empire, which was not as favourable to a large extension of supply, as he could have wished. "We cannot," remarked Mr. Gladstone, "entertain sanguine expectations that any very large additions to the quantity of Chinese tea available for the wants of this market will be forthcoming in the next twelve months; but we hope that in a couple of years from now an adequate increase of supply may be relied on from the Celestial Empire." In a subsequent Budget Mr. Gladstone reduced the duty from one-and-tenpence to one-and-fivepence in the pound, but it was not until 1863 that, holding up in his left hand a small packet of tea marked one shilling and fivepence, and in his right hand a much larger packet marked one shilling, Mr. Gladstone showed in his Budget of that year how much the reduction of the duty from one shilling and fivepence to one shilling in the pound would redound to the advantage of the purchaser. Two years later the shilling duty was further reduced to sixpence, and so remained until in his last Budget Mr. Goschen made a further concession of twopence in the pound. The result is that the consumption of tea in the United Kingdom has kept pace steadily with the successive diminution in the duty which, catering for the poorest classes of the population, it is the ambition and policy of each successive Chancellor of the Exchequer to continue. Every one is aware that excellent tea is now to be obtained at two shillings, or even at one and sixpence per pound, and it will startle the humble consumer to read that more than one hundred shillings per pound have just been paid for a consignment from Ceylon. In his recent speech at Hawarden, Mr. Gladstone stated that tea now cost one-quarter, and sugar one-sixth, of the price they commanded fifty years ago. Tea, in its rapid advance to ever-increasing popularity, has never been exposed to the attack by which coffee was at first assailed. Thus, we read in Messrs. Thornbury and Walford's "Old and New London" that the rainbow Tavern in Fleet-street was the second coffee-house opened in the Metropolis. Four years before the Restoration, William Farr, a barber, began to offer coffee for sale next door to the Rainbow, trusting to the young barristers in the

Temple for support. It was not to be expected' however, that the vintners and liquor-sellers in that bibulous neighbourhood would submit tamely to the introduction of a non-alcoholic beverage. Pretending that their neighbours disliked the smell of the roasting coffee, the Bonifaces of Fleet-street indicted Farr as a public nuisance, and endeavoured to force him to shut up his shop. The indomitable barber, nevertheless, persevered in the teeth of their opposition, and the "Arabian drink" soon became amazingly popular. A satirist, who sympathised with the good old drinking days, was compelled to write regretfully: "And now, alas! the drink has credit got, And he's no gentleman that drinks it not."

Although tea was much slower than the "Arabian berry" in "catching on" with the public, yet having once made a start it soon outstripped its more exciting brother. On the 28th of September, 1660, Samuel Pepys writes in his "Diary": "I did send for a cup of tee, a China drink of which I never had tasted before"; and a little later he adds that, on reaching home, he found his wife engaged in making "tee"—"a drink which Mr. Pelling, the potticary, tells her is good for her cold and defluxions." At that time the price of a pound of "tee," which was almost universally pronounced "tay," was from six pounds sterling to ten pounds; and the consumption was sufficient in 1669 to induce the East India Company to import "the new commodity" for the first time. Their importations came straight from the Flowery Land; but in 1666 Lord Arlington brought over a large consignment from Holland, and sold it as a particular favour to his friends at sixty shillings a pound. It is reported, indeed, by Mr. John Timbs that the first cup of tea ever made in London was drunk by Lord Arlington in Buckingham House, which stood on the site now occupied by Buckingham Palace. Following his Lordship's example, Garraway, the founder of the celebrated coffee-house in Exchange-alley, issued a shop-bill proclaiming that "Tea hath already been sold in England in the leaf for six pounds and sometimes for ten pounds the poundweight, and in respect of its former dearness hath only been used as a regalia at great feasts and entertainments. The said Thomas Garraway did therefore purchase a quantity thereof, and sold it in the leaf from sixteen to fifty shillings in the pound, making it into a drink, according to the directions of the most knowing merchants and travellers into those Eastern realms; and upon experience of his continued care and industry in obtaining the best tea and making drink thereof, very many noblemen, gentlemen of quality, and physicians have sent to him for the same leaf, and daily resort to his house to drink thereof." The experienced tavern-keeper well understood what is often forgotten in these days—that no one can make a cup of good tea without bestowing time, thought, and attention upon the brewing thereof. The demand for tea in now so enormous that other countries have come into competition with China, and more of the leaf is imported from India than from the Celestial Empire. Last year Ceylon alone supplied nearly thirty-three million pounds out of our total consumption of about six times that amount. The amazing price just given for Ceylon tea will undoubtedly stamp it as the best in the world. The Chinese drink has superseded the Arabian to such an extent that there are said to be five consumers of tea against one of coffee in the United Kingdom; and so abundant are the sources of production whence this necessary commodity can be drawn in the future that there is little danger of the humble tea-drinker having to give a higher price for "the cup which cheers yet not inebriates" than she has paid in the past. There is but one country—Australia—which, relatively to population, is a larger tea-drinker than the United Kingdom, seeing that at the Antipodes the annual consumption is at the rate of nearly eight pounds per head, while in this country it is rather less than five. We trust that the tea-planters of India and Ceylon will be encouraged by this extraordinary sale to aim at quality as well as quantity in their future productions.—*Daily Telegraph*, Jan. 17th.

THE HILL-COUNTRY PLANTING REPORT.

MARVELLOUS SALE OF GALLEBODDE GOLDEN TIPS

has brought me the following letter from Col. H. Byrde:—

"Goytry, W. Pontypool, Jan. 22nd.

"In case you should not have received an article published in the *Daily Telegraph* upon a sale of tea from Gallebodde, I venture upon the privilege of old associations and 'ancient' friendship gives me, to send it to you as a clipping from the paper, and as likely to be interesting to you personally, and to the many readers of your valuable paper who are now engaged in the new enterprize of tea cultivation, in which, I am thankful to say, that I have a small interest, for it seems part of my happiness to be still engaged in some enterprise in a country where I began to plant coffee at Black Forest now 55 years ago, and in which I have never been without some agricultural interest.

"Alas! one after another of our old friends are called to their rest, and only last week my dear old and valued friend and brother officer for many years, was called home, Major-General Wm. T. Layard, one of the most genial and pleasant men the Rifles ever found, an excellent officer and a good Christian. We were subalterns together and were associated in after life, and while I mourn the loss of a friend, I cannot but feel that he is one more gone to the heavenly home, whither we shall soon follow.

"I have been glad to see from time to time that you are still blessed with health and strength for the duties of life, and I am thankful for the same blessing, and am actively engaged in County Counci work and Magisterial duties, and feel that I, too, should soon 'subside' had I no longer an abundance of work to do; and your weekly issue is more and more valuable as years pass on."

It is surely interesting to know that there is a man living who commenced

COFFEE PLANTING FIFTY-FIVE YEARS AGO,

and who, having seen the collapse of the once great enterprise, with which, from its beginning, his family was so closely connected, has survived to have an interest in what promises to be the still greater enterprise of tea. My own connection with forest pioneering and coffee planting dates back to just the half-century. I was in the Ambagamuwa jungles, then only touched by the axe on their outskirts, in May 1840. In December of that year I entered Uva; and by May I had cut the boundaries of nearly 4,000 acres and "put in" a couple of nurseries. The article sent by Col. Byrde (which you will insert in the proper place) is interesting. We cannot, however, meet the wishes of English writers by *growing* golden tips any more than the superintendent of a coffee plantation could obey a proprietor who ordered him to

GROW ONLY PEABERRY.

They have a similar story in Australia of the owner of a pastoral run who gave instructions that only "wethers" were to be bred. The crusade against coffee on its first introduction as a beverage reminds me that in my boyhood I read in one of Mrs. Trimmer's books of advice to domestic servants to avoid tea as they would poison and to stick to good honest beer! As an advertisement this astonishing sale of Gallebodde tips must further

THE INTERESTS OF CEYLON TEA,

and I suppose the entrance of Sir Graeme Elphinstone and Messrs. Figg and Powell Jones into the directorate of Horniman's Tea Company indicates that henceforward Ceylon tea will be more largely than ever distributed by that firm.

PLUMBAGO MINING IN CEYLON BY A NEW COMPANY.

Mr. A. Y. Daniel, Auctioneer and Commission Agent, writes:—"I have to report sale this day by auction of 17 tons uncured plumbago belonging to the Gemming and Mining Co. of Ceylon, Limited at R185 per ton."

A NOVEL ADVERTISEMENT FOR CEYLON TEA.

Our contemporary of the London *Daily Graphic* must, we should think, have been somewhat "cornered" for a subject for its illustrations when it gave place to what, it must be presumed, was a *post factum* sketch of the scene in the Mincing Lane tea-sale rooms on the occasion of the bidding for the lot of Gallebodde tea which has recently fetched such remarkable and previously unheard-of prices. However, there can be no reason why we should decline to welcome such an advertisement of our teas. It will, doubtless, have done much to attract public attention to the high excellence of our island produce, and will almost certainly have induced many to give it a trial—a trial which we may feel confident will go far towards extending the popular taste for Ceylon tea which has been of such rapid spread throughout Great Britain.

Nor, while giving prominence to this particular instance of pictorial advertisement of a group of excited gentlemen all anxious to become the buyers of what is perhaps in itself only a curiosity, should we overlook what has become the subsequent career of the tea itself. Our London correspondent gave us previously a letter to the editor of the *Times* broaching the subject, and he has since sent us an advertisement inserted in the same journal by the United Kingdom Tea Company which was the buyer at second hand and at the unprecedented price for tea of £5 10s 0d per pound, inviting the visit of the curious in such matters to view the sample. Both these notices cannot fail to receive much of public attention, and they must consequently, whilst economically advertising the purchasing Company, enlarge the borders of the popular estimation in which Ceylon tea is held. For all this "much thanks" to the proprietors and manager of the Gallebodde estate! It must remain, however, a moot point, whether those gentlemen will have benefited themselves in anything like the same degree that they have benefited the industry of which they are representative. Our home correspondent quotes to us the opinion of a well-known expert on the subject of this lot of tea, that this particular lot of tea can only have been produced by the sacrifice of the quality of a considerable portion of the estate production. We are informed that the full payment made by the Company above referred to was about £80. At the rate of £5 10s the pound it is evident that about 15 lb. of this special sample must have been brought together, and some feel curious to know how large was the bulk of tea which must have been depreciated in value to obtain this quantity of "golden leaf." That term may be used advisedly—though, in a commercial sense, it may be misapplied, because, on being viewed "the sample looked like small wiry pieces of gold."

Altogether, we feel inclined to remark with the French General who witnessed the grand charge of the Light Brigade at Balaclava that "*C'est magnifique, mais ce n'est pas la guerre.*" Another French saying occurs to us in this connexion as aptly applying to this venture, and that is that perhaps "*Le jeu ne vaut pas la chandelle.*" That is, however, only immediately a matter for the consideration of the proprietors of Gallebodde. The community will be quite content to accept the probable good results to our industry without caring to raise the question of the purely economic value of the act. But lest other among our planters should be induced to follow their example, it appears desirable that we should ask them to bear in mind that although this special lot has secured a price which will doubtless compensate its growers for their trouble and for the depreciation of some bulk of their produce, any who might be induced to imitate them can by no means rely on future efforts of the kind meeting with equal success. It was the novelty, no doubt, which excited the strong competition witnessed to become the possessors of this abnormal parcel of tea, and it is scarcely likely, we should say, that even a second lot appearing in the market would obtain anything like equivalent prices or attract the public attention in the way this lot has done.

It is amusing to note the ignorance that has been shown at home as to the method by which this fine specimen of our tea has been produced. The *Investors' Guardian* has remarked with respect to it, that "with *connoisseurs* in tea, able and willing to pay such prices, planters should be encouraged to cultivate the finest varieties with the greatest care." All the home papers which have noticed this particular sale have written of it in somewhat similar terms, and it is evidently the widely-diffused opinion at home that this tea has been the result of a specially careful form of cultivation; as, also, that the price paid for it has been due to appreciation by tea *drinkers.* Both of those conclusions we here in Ceylon know to be fallacious. However cultivated the taste for tea may be, and however appreciative of high merit in the leaf, it is not likely that a drink which would cost the consumers, we are told, something like 1s 9d the cup of infusion would obtain purchasers. This lot of Gallebodde tea, as we have said, must be regarded only as a curiosity. Multiplication of such lots would deprive them of that qualification and they would no longer serve the purpose of advertisement, either for individual estates or for individual companies or firms. Tea planting must, to be successful, be conducted on purely commercial and not on æsthetic principles. To the latter class we should assign the classification of this curious specimen of Ceylon tea.

RAINFALL IN LOWER MASKELIYA.

ANALYSIS OF RETURNS FOR THEBERTON AND ELFINDALE ESTATES.

NANUOYA, Feb. 10th.

On the rainfall map of Ceylon, issued with the Surveyor-General's Meteorological Report, the deepest shade of colour marks a comparatively limited space near the centre of our mountain region, if we include the scattered "foot-hills" and detached ranges in the south and east, where the mean annual rainfall is 200 inches per annum and over. In this spot, at the foot of Adam's Peak and along the rivers which flow into the Kelani Valley, the three recording stations are Theberton with an average of 217 inches, Kandaloya 205, and Sembawatta 205. The altitudes at which the observations on these places are taken are:—Theberton, Maskeliya, 3,315 feet; Kandaloya, Yakdessa, 2,400;

Sembawatta, Nawalapitiya, 1,500 feet. It will thus be seen that the altitudes at which the rain-clouds chiefly strike the sides of the mountain ranges in Ceylon and have their vapour condensed into rain vary from 1,500 to 3,300 feet above sea-level. In India the rainiest station, Cherapunji, is at an altitude of about 4,300 feet on the side of the Himalayas; and were an observatory situated at an equal elevation near Adam's Peak, its mean annual rainfall would probably amount to 300 inches, against nearly double that quantity at the Assam station, the rainiest on the globe. Meantime, from fi ures which have reached me, it seems that ELFINDALE, at 3,000 feet elevation, and about ⅝ of a mile S. W. of Laxapanagala, which, itself, rises about 3,000 feet still higher and is distinguished by a series of formidable cliffs, ought to be included and given first place amongst

THE RAINEST POSITIONS IN CEYLON.

Like Theberton it is situated on the side of a valley down which run a series of parallel rivers which have their origin on the Peak ranges, and along which the rain-laden winds of the S.-W. monsoon sweep, depositing liberally their pluvial treasures. From figures for 5 years, with which Mr. Grigg of Theberton has favoured me, it results that the average annual rainfall of Elfindale is no less than 246·45 inches. In the first year of the series, 1886, the quantity which fell closely approached 300 inches,—the actual figures being 294·52 inches. Of this quantity 96·86 came in the first half of the year, with no less than 197·66 in the latter half. In the 4 months June to Sept. of that year, the deposit of condensed moisture was represented by such figures as the following :—

June ..	39·64	inches
July ..	42·59	,,
Aug. ..	66·72	,,
Sept. ..	41·08	,,

Total for 4 months 190 03 inches. A

WET PERIOD

certainly! There is no rainless month in the record, but Feb. 1888 had only 40 cents against an average of 2·21 inches. The highest average 48·36 inches is against June. The variations in the annual rainfall at Elfindale have been from the maximum of 294·52 in 1886 to the minimum of 211·77 in 1889. But there has been no falling-off such as Mr. George Grieg has experienced on Laxapana, for the rainfall of 1890 was 249·33 inches, or 3 inches in excess of the average. The annual average for Elfindale being 246·45, the monthly averages are :—January 2.27 ; February 2·21 ; March 4·90 ; April 13·31 ; May 26·46 and June 48·36 ; the average for the first half of the year being 97·53 inches. In the second half of the year, the averages are: — July 33·74 ; August 35 21 ; September 33·16 ; October 27 09 ; November 12·53 and December 71 8. So much for Elfindale, which would seem to receive

MORE RAIN THAN THEBERTON

in proportion to its nigher proximity to the great cloud-cooler Laxapanagala. Against ⅝ of a mile S.-W. of this great and steep mountain, in the case of Elfindale, the rain-gauge at Theberton bungalow bears W. S.-W. from the mountain, distance one mile, with an elevation higher by 315 feet than that of Elfindale. For the 5 years ended 1889 the average rainfall of Theberton was 217·08 inches For the sunspot period of 11 years, to end of 1890, the average is 221·11 inches; 82·54 for the first half of the year and 138 57 for the second half. In the 11 years the variations in the annual rainfall have been from 184·10 in 1885, the lowest, to 287·39 in 1882, a year of excessive rain in Dimbula as well as in districts nearer the Peak and its ranges. When we come to

THE HEAVIEST RAINFALL IN ONE MONTH,

Theberton, we believe, beats the record, with 78·81 inches in June 1888, the figure for the whole of that year being however, somewhat below the average, viz : 216·81 against 221·11. It is curious to notice how inequalities are reduced or raised so as to give a return to averages. The excessive rainfall of 1882, when the figure was 287·39, was followed by 205 73 for 1883 ; 194·40 for 1884 ; and 184·10 for 1885. Then came a reaction in 1866 to 258·30, followed by 213·80 for 1887. In the past 5 years the rainfall has been below the average, going down to 197·21 in 1890. But there has been no reduction of the general average, to compare with that which Mr. George Greig lately reported from the neighbouring Luxapana estate. There is a Laxapanagala estate, from which we should like to see returns. In 1890 the rain was measured at Theberton Factory, which is at 3,000 feet elevation, against 3,315 at the bungalow, and distant only ⅝ of a mile from Laxapanagala, against 1 mile in the case of the bungalow. The result was 208·84 inches at the store, against 197 21 at the bungalow, a difference of more than 11 inches. This shows the influence of

POSITION AND TOPOGRAPHICAL FEATURES,

with reference to rainfall. The monthly averages, established by 11 years' observations at Theberton bungalow, are :—Jan. 2·28 ; Feb. 2·87 ; March 6·14 ; April 9·45 ; May 21·58 ; June 40·19 ; July 30·98 ; Aug. 33·76; Sept. 24·33 ; Oct. 27·17 ; Nov. 13·50; and Dec. 8·82. With a record of 5 years' observations, Elfindale, with an annual average of 246·45 inches, is

T E RAINIEST CEYLON ESTATE

of which we have any authentic knowledge, but we repeat our conviction that in some places on the slopes of the Peak and its flanking ranges, Laxapanagala, &c., the annual average must be up to 300. We heard some years ago before it was established that tea could flourish not only in 70 inches per annum, but in 300,—that observations taken on some estates were suppressed for fear of impressions injurious to such estates being formed. To Mr. Grigg's credit it is that he has always published the exact truth regarding the rainfall on Theberton ; and now equally authentic figures enable us to say that on one tea estate in Ceylon at least the annual average rainfall is close on 250 inches. Let us now hear Mr. Grigg himself on these interesting returns In sending them, he wrote :—

"I send you Elfindale rainfall for 5 years and mine at Theberton bungalow for 11 years and at my Factory for 1890. Also a rough sketch of how the rain-gauges stand as to the big Laxapanagala range, the highest peak of which stands above, at some 3,000 to 4,000 ft. (The exact height of the peak has never been properly taken, as it was said by the surveyors, it was impossible to get on the top of it to place a trig which they wanted to do ; so they have never bothered to get its height correctly. Last year, however, the Peak was scaled by three young fellows, and a flag placed on the top, distant from Theberton bungalow about one mile, as that old bird the crow flies.) The factory gauge is ⅝ mile from peak. Elfindale gauge ⅝ mile from the peak. All are nearly in a straight line from the highest point, which bears W. S.-W. Taking the W. N.-W. wind draught up the valley, this would deflect the S.-W. monsoon rain current to about W.S.-W., or right across our rain-gauges. You will note that Elfindale average for 5

years is 246·45 inches; Theberton for 11 years 221·11,—an increase to Elfindale of 25·34 mean., by being closer to the mountain. 1890 rainfall gave more viz.:—

Elfindale	249·33
Theberton Factory	208·84
Bungalow	197·21

I expect the increase to the nearer station to the mountain would be more or less, as the S.-W. monsoon has more or less southing or westing in it, or maybe when it is stronger, so carrying rain clouds further off. I believe if a gauge was kept on Laxapanagala say ¼ mile west of Elfindale, it would show a much heavier rain fall than Elfindale. Strange at Laxapanagala bungalow, which is about a mile in a straight line N.-W. from Elfindale, the rainfall is said to be less. This is accounted for by the mountain decreasing in elevation as it runs to the west, below Laxapanagala falls. I should say, they had a much better climate than here, that is still further west—as I note the sun shining often there when we are all cloud and mist here. Though I see in today's *Observer* that at Arslena (which is lower down in Dikoya Valley) the rainfall is very heavy.* The main reason our rainfall being so heavy the hot air is carried right on to the mountain from off the lowcountry without any hills of any considerable elevation taking the moisture out of the S.-W. current. I rather fancy the S.-W. about middle Maskeliya travels across a lot of high land, which wrings the moisture out of it before it falls in the Valley. I trust I am not intruding by sending you these notes. As I know you take great interest in these things I thought you might like to see them. If you think it worth while you might send these notes on to Colombo, Mr. Greig of Laxapana having sent you notes of his rainfall, I thought you would also like to see ours, which in a way are unique. Mr. Galton of Elfindale kindly gave me his rainfall for 5 years. The rainfall has been kept off and on on Elfindale for many years, but I am afraid previous to r. Galton's, they are not to be relied on; besides they were kept at the bungalow, which is right under the Laxapanagala cliffs, and I believe the rainfall there was very large. Unfortunately the returns could not have been kept regularly. Tea flushing very well. We have had a lot of red spider and mosquito blight; but since the nice showers we have had this week, the pests are disappearing. Thunder storm last night in S.-W. Looks at present (Feb. 6th) like more rain.

I am sorry to see my good friend Mr. Grigg's reference to red spider and *helopeltis* as having given him trouble. I do not attach much importance to the former, so far as I have seen or heard of it in Ceylon, It seems to come and go away, without doing much harm. The contrary seems to be the case in India, as witness the following extract from a Darjiling letter in the *Indian Planters' Gazette*:—

Mr. Christison, the General Manager of the Lebong Tea Company, has been carrying on a series of experiments with sulphur as an insecticide with especial reference to red spider, which has been working such a vast amount of havoc on very many tea estates in this district. Mr. Christison has always gone thoroughly into everything he takes up since he came to the district, something like thirty years ago, and as he is particularly well up in matters connected with agriculture, the results of his investigations, carried out as they have been during a number of years, over a very large acreage, and very accurately noted are deserving of weighty consideration in all the tea districts. After trying all probable cures for red spider blight, such as tobacco, juice, lime water, kerosine oil, soap suds, and mud and water Mr. Christison found sulphur by far the best remedy for this pest. He has been using it since 1879 up to the present time, and over an area of about 400 acres, so that the trial has been an exceedingly extensive one, and may be looked on as having passed well beyond the merely experimental stage into that of sound practice. This year the Lebong Company's gardens are being sulphured in downright earnest, as no less than 15 tons (a large order indeed) of it have been procured for the special annihilation of the spider. The sulphur is liberally applied to the bushes in the following manner, which certainly has the advantage of being very simple indeed. As soon as the spider begins to show any signs of life, or when there is a longish spell of dry weather without any wind large garden syringes are brought into use; with these the bushes leaves, stems, branches and all are thoroughly syringed with water, the powdered sulphur is then thoroughly dusted all over the bushes out of a canister or a gauze bag. If no rain falls for some time after the bushes have been sulphured, all the better; so that it is of importance that an appropriate time of year should be chosen, say, from January to the end of April. The advantage of this sulphuring the bushes is that it is inexpensive, is at all events handy, and the requisite labour for carrying out the work is, generally speaking, more available during the cold weather, and up till the end of April, which is a very important point. Mr. Christison tells me that his treatment has a wonderful effect, far exceeding any other cure. The plant so thrives and grows after it for three years that one would almost think it acted as a manure, in addition to killing the spider entirely the first year. The pest does return after three years, but by that time the plants have become invigorated to some extent and can the better grow out of the spiders' attacks. Mr. Christison is inclined to think that in three years the capital expended in sulphuring the bushes will be returned in increased outturn with about 15 per cent. extra, and that the plants at the end of that time will have been vastly improved. The fumes of the sulphur can be smelt from afar as one passes by, 300 yards off, and even can be detected in the factory in April and May. The result of the brokers' valuations and of actual sales have not shown that there has been any deterioration in the quality of the tea sent to market; and as a matter of fact, the fumes have entirely gone off before the tea is finally packed. These carefully observed and recorded facts are deserving the attention of all interested in tea manufacture, and I commend it to their notice through the medium of your columns.

The application of sulphur, after the fashion described, ought to be equally efficacious, I should say, against the "mosquito blight," which, from what I saw of the savages of *helopeltis* in Java and what I have read from its terrible effects on the yield of Indian tea plantations, I consider much the more formidable

ENEMY OF THE TEA PLANT

and the tea planter. But as Mr. Grigg's mention of "the spider and the fly" (beetle, rather) is the first I have seen or heard of for a long time, I trust the attack noticed is isolated, and that it will neither recur nor spread. Up in this region, there is not the slightest trace of any insect or fungoid plague, except a little moss on the stems of the bushes and a little bronzing of old leaves which is of no consequence. Even the moth, which at one time, some years ago, gave trouble in curling up the flush, seems to have entirely disappeared.

* 226·43 inches against 249·33 on Elfindale.

KEEPING MACHINERY FROM RUSTING.—A mechanic says that in order to keep machinery from rusting he takes one ounce of camphor and dissolves it in a pound of melted lard, taking off the scum, and mixing in as much fine black lead as will give it colour. The machinery is then cleaned and smeared with this mixture. After 24 hours the machinery is rubbed clean with soft linen cloth, and it will keep clean for months. The same artisan gives the following method of hardening tools: Forge the tool into shape, then melt in a dish sufficient Babbitt metal to cover the end of the tool as far as it is wished to harden it. Thrust the tool into the metal and let it cool. This method makes the tool much harder than cooling in oil or tempering by any other process.—*Chicago Tribune.*

MR. HUGHES AND TEA ANALYSES AND "RAG" MANURE.

Meeting Mr. John Hughes this week, the question was put to him by me as to whether he had yet been commissioned to make the analyses of tea respecting which he had been in communication with your Planters' Association, and which, it seems to be the general opinion, might be productive of very valuable results. Mr. Hughes told me that he had received a very polite letter in acknowledgement of his offered terms for doing this, but that it contained no instructions to undertake the work.

That gentleman further told me that he had at length heard something as to the result to the application of the "rag" manure on the Mariawatte estate. He said he had heard from Mr. Rutherford that, having been applied side by side with a patch which had been treated with cattle manure, the trees on the latter had borne much the more freely. This apparently discouraging result must, however, be largely discounted, for Mr. Hughes observed to me:—"You will recollect when we first talked upon this subject that I told you that one reason why I had recommended a trial of this manure was because it had been ascertained to be so slow in its action. All my experience goes to show that if rapidly forcing manures can be avoided it is invariably better for the cultivation. Now with English farming it is a necessity to use fertilizers that are rapid in their action, that will yield up their constituents to the soil as quickly as possible. When you consider how few months are available for farming here at home, you will see that there is no time available for slow decomposition to work. Horse and cow manure is always allowed a certain amount of decomposition before use in order that it may commence yielding up directly it is applied to the ground, and this accounts mainly for the storage in manure heaps for a long time in advance of actual use. The use of farm litter, too, is largely subsidized in England by mineral manures, such as sulphate of ammonia and nitrate of soda, both of which begin to work directly they are applied. But there is no necessity for you out in Ceylon to demand such quick action. It is always injurious to *force* anything in nature, and as you have a climate in which your tea bushes can take up nourishment throughout the whole year, it is in my opinion much better to attain results gradually and not to use forcing mixtures. That is the reason why I yet think—in spite of the apparently disadvantageous comparison to be seen on Mariatwate—that the owners of that estate may yet come to acknowledge the superior value of this new manure. I admit that it is twice as bulky as are most mineral manures, and that that constitutes an objection; but on the other hand I believe that mineral manures are very ill-suited to the conditions available under the climate of Ceylon."

COFFEE AND CINCHONA CULTURE.

During our conversation we touched upon the decadence of your coffee and cinchona cultivations. Mr. Hughes said he had never believed in the latter being well adapted to Ceylon soils. These soils were far and away, he said, inferior to those of India for the growth of those trees, and he had not been surprised to hear of the numbers of them which had died out after a certain age of growth. In reply to a question as to what he thought of the probable permanence of tea cultivation, Mr. Hughes expressed the opinion that it had every chance of it. "Indeed," he went on to say, "tea seems to me to be just the very thing for Ceylon planting. What do you specially observe as the chief characteristic of Ceylon scenery? It is essentially *green*, that is to say luxuriance of leaf pervades the island. Nature therefore teaches you that to produce leaf is almost certain to be the industry to which it will lend itself in Ceylon. It don't seem to me that a berry like coffee would be as suitable or as reliable as tea, and as to cinchona I have already told you what I think about it. Rely upon it, both the climate and soil of Ceylon are the best adapted for tea. It is essentially a *leaf* island."—London *Cor.*

MANA GRASS EXPERIMENTS.

Calling in at Messrs. Curtis & Harvey's this week, one of the partners obligingly told me that he had just been to their mills at Hounslow that he had seen the charcoal burned from the ton of mana grass, and that the outturn was satisfactory both as to quantity and as to quality. "But," he said, "I can't give you any opinion as to the suitability of the grass for our purposes until some has actually been made into gunpowder. We expect to commence doing this very shortly, and you shall know the result of our first trials with it."—London *Cor.*

NOTES ON PRODUCE AND FINANCE.

REDUCTION OF DUTY ON TEA INCREASES CONSUMPTION.—That this is the case is fully proved by the fresh strides which have been made in the consumption of tea during the past year as a result of the lowering of the duty in May last to 4d per lb. Prior to the reduction of duty the increase in the consumption was very small last year, but in 1890 it may be said to have suddenly started forward, and the total for that period was 8,386,692 lb. above the corresponding one in 1889.

MINCING LANE BUOYANT.—In Mincing Lane the easy state of the money market has largely increased the speculative business in produce. In the tea market there is much animation, and the volume of business in this article passing through the Produce Clearing House is heavier than at any time since this institution was first used as the channel for speculative dealings. Prices have daily advanced, and now show a very important rise since the commencement of the year.

THE DECLINE AND FALL OF THE CHINA TEA TRADE.—China is sadly worsted in the tea competition by Indian and Ceylon. The exports of tea show a falling off of 6 per cent against the corresponding quarter of last year.

During the past year a survey of the industries of Lower Burmah has been made, and a Provincial Board is deputed to consider these and advise the Indian Government as to the best means of promoting technical and scientific education in that province.—*Globe.*

COFFEE IN COORG.—There is very little crop, for sale, and the owners of coffee are holding out for 300 rupees a Candy, *i.e.*, quarter of a ton. Intending purchasers fight shy, and don't want to be liberal in the price they will pay. In the meanwhile there is said to be no money in the country, and all trade is driven to the winds. The people are also suffering by reason of the loss of their paddy crops.—*Bangalore Spectator.*

Mr. J. D. Pasteur, Inspector of the Post and Telegraph Service of Java, has sent to Dr. T. A. Jentinck a teak telegraph pole from the Kediri Residency, Java, which in spite of its iron hardness has been pierced with holes, near where the insulators were attached, by the beaks of a local woodpecker (*Picus analis*). These holes are also made in the living kapok trees (*Eriodendron anfractuosum*), which are utilised as telegraph poles in Java. In Norway the like thing has occurred, and it is supposed the birds have mistaken the humming of the wire for a nest of insects inside. Large cairns used to prop up telegraph poles in Norway have also been scattered by bears, perhaps for a similar reason.—*Globe.*

THE HOREKELLY ESTATE COMPANY, LTD.: ANNUAL MEETING.

The annual general meeting of shareholders was held at the Company's office this day at 1-45 p.m., Mr. F. C. Loos in the chair, and there were also present Messrs. A. Schulze, Stauiforth Green, F. C. Loos, W. B. Baring, F. J. De Saram, E. W. Suhren, V. A. Julius, Stanley Bois, Wm. Law, and R. L. M. Brown (Secretary). The following were represented by their attornies:—Henry Bois, W. J. Carver E. Christian, E. Daendliker, F. W. Bois, Mrs. F. W. Bois, J. B. Alston, Alexander Gibson, W. G. Ingles and executors of the late Mr. E. Robinson.

THE CHAIRMAN'S SPEECH.

The minutes of the last meeting having been read and confirmed,

The CHAIRMAN said that shareholders would have observed from the report that the expenditure for last year had been somewhat reduced in comparison with that of tho preceding year—the expenditure for the year 1889 being R32,448·77, while that for 1890 was R29,492 09. There had been a slight increase in the quantity of copra produced, but there was a noticeable diminution in the quantity of coir fibre made—43,358 ballots having been turned out for 1889, whereas the outturn for 1890 was only 21,850 ballots—the decrease of production being due to the difficulty of finding an outlet for the fibre, which caused the quantity produced to show a large failing-off. There was one important matter connected with the estate which was worthy of remark, and that was that the Directors had f r years past been applying manure to the different parts of the estate, and they found that tho return was commensurate with the amount of money spent in applying this manure. The thing had, however, not been done systematically during the previous years, but from this year they intend doing this experiment systematically, and he had no doubt that this statement would meet with the approval of the shareholders. He needed scarcely remark that the more manure they applied to their estates, the greater would bo the yield and the larger would be their dividend. With these remarks he begged to move the adoption of the Report. (Applause)

DIVIDEND.

The CHAIRMAN said that the next matter was to declare a dividend, whereupon on the motion of Mr. V. A. JULIUS, seconded by Mr. WM. LAW, it was resolved that a dividend of 5 per cent on the paid up capital be declared.

APPOINTMENT OF DIRECTORS.

Mr. BARING moved that Mr. F. J. De Saram bo re-elected Director and Mr Percy Bois be elected in the room of Mr. P. Daendliker, the retiring Director —Seconded and carried.

APPOINTMENT OF AUDITOR.

The CHAIRMAN said that they had to elect an Auditor in the room of Mr. S. T. Richmond who was eligible for re-election. He had satisfactorily discharged the audits of his office and he begged to move that Mr. S. T. Richmond be re-elected.—Carried.

THE COMPANY'S REGULATIONS.

The CHAIRMAN said that before they separated he desired to draw the attention of the members to the Company's articles of association, which required the attendance of 17 shareholders to form a quorum. The quorum was formed under the Joint Stock Companies Ordinance; but he thought that seven or eight shareholders would be quite sufficient to convene a meeting. He intimated that he would bring forward a special resolution on the subject for the purpose of reducing the quorum of shareholders in view of the difficulty such as they had experienced that day in obtaining a quorum under the ordinance.

This concluded the business of the meeting.

REPORT OF DIRECTORS.

1.—From the accounts for 1890 now submitted it will be seen that the profit on the year's working amounts to R19,986·17. Depreciation of plant and machinery at the usual rate has been deducted—viz., R2,009·04, thus leaving (with the balance of R419·11 brought forward from 1889) a sum of R18,396·21 at the credit of profit and loss.

2.—The Directors recommend that a dividend at the rate of five per cent on the paid up capital be declared. This will absorb R17,567, and leave a balance of R829·24 to be carried forward to 1891.

3.—The Crop of the past year must be considered as satisfactory in view of the very short rainfall and prolonged drought, while the Directors are happy to report that the prospects for 1891 point to an increased yield over 1890, if normal weather be experiencd.

4.—The difficulty of finding an outlet for coir fibre has caused the quantity produced to shew a large falling off, but the production can at any time be increased as opportunities arise for its dispsoal.

5.—The working of the two seasons, 1889 and 1890 compares as follows (the item of interest being excluded):—

		1889	1890
Expenditure on estate and in Colombo Office		R32,448·77	29,492·09
Quantity of Copra produced ...	Candies	805	941
Do Coir Fibre made ..	Ballo's	43,358	21,850
Average price obtained for Copra per candy ...		R39·36	39·94
Agerage price obtained for Coir Fibre per cwt. ...		R4·54	6·16

BALANCE SHEET MADE UP TO 31ST DEC. 1890.

Dr.

Capital and Liabilities.	R	c.
I. To Capital—		
1,542 Shares at R100...	154,200	00
50 do 90...	4,500	00
2,408 do 80	192,640	00
4,000	351,340	00
II. To Debts and Liabilities of the Company—		
Loan on Mortgage	75,000	00
Balance due for wages to Coolies, Contractors, &c., at 31st December	1,469	96
Sundry Credit Balances	181	02
Directors' and Auditor's Fees	1,433	33
	7884	312
VI. To Profit and Loss Account—		
Balance of this Account ...	18,396	4
	447,820	5

Cr.

Property and Assets.	R	c.
III. By Property held by the Company—		
Immovable Property:		
Land under Cultivation and reserved ...	306,400	00
Buildings and Permanent Works ...	37,958	71
	344,358	71
Movable Property:		
Plant and Machinery	80,361	97
Less written off for Depreciation ...	2,009	04
	78,352	93
Stock-in-Trade:		
26 Cattle on Estate	458	00
190 candies 381 lb. Copra	7,318	17
8,238 ballots Coir and Bristle Fibre ...	3,386	25
Steel, Oil, Iron, &c.	1,144	76
Manure account, crop 1891	646	44
Rice in Store	337	00
	13,290	62
IV. By Debts owing to the Company— (considered good)		
For Work and Payments on account 1891	1,193	62
V. By Cash—		
In Bank of Madras on current account	10,622	90
In Secretary's hands	1	77
	10,624	67
	R447,820	55

REVENUE AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31ST DEC. 1890.

Expenditure.	R	c.
Colombo Office Expenses—		
Directors' Fees	1,333	33
Managing Director's and Secretary's Fees ...	1,666	65
Auditor's Fee	100	00
Postages, Stationery, Advertising, &c. ...	110	31
	3,210	29

	R	c.
Interest	3,870	65
Estate Expenditure—		
Superintendent's Salary, Coolies' Wages, Miscellaneous Expenditure	26,281	80
Balance to Profit and Loss account ...	20,188	00
	R53,550	74

Revenue.	R	c.
Sales of Copra	37,583	10
„ Coir Fibre	15,946	64
	53,529	74
Transfer Fees	21	00
	R53,550	74

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDING 31st DEC. 1890.

		R	c.
1889			
Sept. 15th	To Interim Dividend at 2 per cent. account 1889	7,026	80
1890			
March 31st	To Final Dividend at 2 per cent. account 1889	7,026	80
		14,053	60
	To Balance	419	11
		14,472	71
Dec. 31st	To Amount written off for Depreciation of Plant and Machinery ...	2,009	04
	To Loss on Shipment	265	08
	„ Balance	18,396	24
		R20,670	36
1889		R	c.
Dec. 31st	By Balance	14,472	71
		R14,472	71
1890			
March 31st	By Balance	419	11
Dec. 31st	„ Balance of Revenue and Expenditure account	20,188	00
	„ Recoveries of Bad Debts ...	63	25
		R20,670	36

E. & O. E.

Audited and found correct, (Signed) S. T. Richmond, Auditor.

(Signed) F. C. Loos, Chairman. E. Christian, F. J. De Saram, and P. Daendliker, Directors. R. Lewis M. Brown, Secretary.

Colombo, 29th January 1891.

CATTLE AND SALT.

The following occurence which has come within the scorpe of my observation is not only amusing but also shows how CATTLE are found of SALT especially up here on these hills in the interior where there is little chance of the sea-water spray being carried up by high winds to be deposited on the land in spite of the fact the saltpans at Hambantota can be seen from the Haputale Pass. A man in charge of a cricket groen in this neighbourhood told me that instead of moving the grass on it he had reccurse to a much easior plan to make the ground smooth and even. He said he could get the cattle to do it all for him and proceeded to show me how. He took some salt-water and sprinkled it on the green; and what was my surprise to see a number of cattle grazing in the adjoining patana shoving each other and rushing up to the spot where the water was sprinkled and eating off the grass wi h great avidity, biting it almost to the very root! By thus spinkling saltwater cattle could be made to graze even on coarse grass which they would otherwise loathe.

THE United States Government has appointed a commission to investigate the subject of the irrigation of the States west of the Missouri. The data collected show that no less than two-fifths of the entire area of the United States is arid and dependent on irrigation for profitable farming.—*Globe*.

STENNING, INSKIPP & CO.'S INDIAN AND CEYLON TEA MARKET REVIEW FOR 1890.

ESTIMATED SUPPLY AND DELIVERY to end of Season 1890-91, and probable Stock on 1st June next—

1st June, 1890, to 31st May, 1891.

	Supply.	Delivery.
Indian	103,000,000	101,500,000
Ceylon	52,000,000	45,500,000
China, Java, &c....	73,000,000	82,000,000

	Stock.		1890. Stock.
Indian	29,000,000	against	27,490,000
Ceylon	16,000,000	„	9,590,000
China, Java, &c....	30,000,000	„	41,000,000

[No reasons are given for estimating a consumption of 101,000,000 lb. Indian out of 103,000,000 imported, while of 52,000,000 Ceylon imported only 45,500,000 will be used. Why should there be in 1891, a result so different to that obtained in 1890? And why should it be taken for granted that the deliveries of China, Java, &c., should exceed the imports by 9,000,000 lb? We can have no confidence in such an estimate.—ED. *T A.*]

EXCHANGE.—The rise in exchange has caused much concern to planters, more especially to owners of those estates which have experienced bad weather, but the fact must not be lost sight of that this rise has been the means of diminishing the China export, thus helping to strengthen the market for Indian Tea, the common grades in particular being benefited.

REDUCTION OF DUTY.—The Tea Duty was reduced on 1st May from 6d per lb. to 4d per lb. The effect has been to enhance the value of common and medium descriptions, more especially Pekoe Souchongs, which are now very largely used by blenders for supplying both retailers and the packet trade.

[A table shows that the home consumption of Indian and Ceylon teas went up from 28,013,000 lb. in 1877, or 18⅝ per cent of the whole, to 136,500,000 or 70½ per cent in 1890. China, meantime, went down from 123,012,000 lb. to 57,500,000. The increase in consumption in 1890 over 1877 was 44,000,000,—the figure for 1890 being 195,000,000 against 151,025,000 in 1877, a period of 14 years. In 5 years the rise was from 174,665,000 in 1866 to 195,000 in 1890, an increase of 20½ millions, or at the rate of 4 millions per annum. The increase being mainly in Indian and Ceylon, may safely be calculated at 6 millions per annum China standard. —ED. *T. A.*]

CEYLON.

THE COURSE OF THE MARKET.—Business commenced with a good demad, but heavy Auctions supervening together with less desirable quality, caused a lower range of prices, except for a few choice Teas. No change occurred until March, when supplies fell off, and with better quality the demand improved, and values advanced until May, when the enquiry somewhat slackened, but only for a short time, as business again became active; in July the prices of less desirable qualities went weaker; good liquoring Teas were unchanged. Arrivals were smaller in August, and an advance took place which was well maintained until October, when less activity was apparent, and in November a decline, due to a poorer selection, occurred, but the year closed with a firmer tone.

QUALITY.—Has shown a distinct improvement on that of last year, the fermentation having been better than hitherto; flavoury Teas have commanded very satisfactory prices, especially when with thickness of liquor. Owing to the scarcity and dearness of the higher grades of China Tea, it is very probable that the persistent efforts to introduce Ceylon Teas into the Continent, as well as into other countries, will meet with more success before long.

DELIVERIES.—From 1st June to 31st December deliveries show an increase of 5,706,000 lb., as compared with 6,336,000 lb. same period in 1889. For the 12 months, 1st January to 31st December, the increase is 7,486,000 lb., as compared with 11,615,000 lb. in 1889. We think the cause of this reduction in the rate of increase is due chiefly to the higher range of values for the commoner grades.

EXPORT.—It is calculated that the crop 1st January to 31st December, 1891, will be about 52,750,000 lb., and that the present area under cultivation may produce in 1894 a total of 74,000,000 lb. The subsequent yearly increase will probably not be very large.

		Average Price.			per lb. s. d.
1890	...	535,611	packages, average		0 10¾
1889	...	431,043	do	do	0 11
1888	...	303,284	do	do	0 11½
1887	...	182,955	do	do	1 0¾
1886	...	101,145	do	do	1 1
1885	...	58,921	do	do	1 3½

[In the 5 years between 1887 and 1890, the deliveries of Ceylon tea nearly quadrupled, rising from 9,942,000 lb. in 1887 to 37,652,000 in 1890.—ED. *T. A.*]

DAVIDSON'S DOWN-DRAFT SIROCCO.

(*To the Editor, Indian Planters' Gazette.*)

SIR,—Your issue of 20th instant contains yet another letter from "Darjeeling," *re* my Down-draft Sirocco, and I am glad to see by it the steady manner in which he is continuing to withdraw one by one, each of his original complaints, until the list of his grievances is now reduced to his inability, as he describes it, "to add 2 to 6 annas per lb in value over tea dried by charcoal." This complaint somewhat reminds me of the man who, after having purchased a type-writing machine, said it was a failure, and wanted to return it, because it did not make any improvement in his spelling!! But in still further support of my statements that the down-draft sirocco, *when properly used*, does produce the highest class qualities of tea, I may quote the following extract from a letter from a well-known Ceylon Planter addressed to me to Belfast and which I have only just received.

"After an experience of 18 months of the original small Down-draft Sirocco and 4½ months of the larger one, I am of opinion that these machines are capable of developing a very high quality of tea, while for convenience of working and economy of fuel I know no machine equal to them." (Signed.) J. N. CAMPBELL. Moray Tea Estate, Maskeliya, Ceylon, 12th Nov. 1890.

Mr. Campbell's teas have been selling at the remarkably high average of fifteen pence, and his factory is in the Hills, and at even a higher elevation than that of Darjeeling, and turns out upwards of 4,000 maunds of tea per annum, so that his experience has been gained in the manufacture of much larger quantities of tea than anything "Darjeeling" has had to do with. But "Darjeeling" in his letter under reply objects so emphatically to my quoting testimonials emanating from Assam, Cachar, Sylhet and the Terai, that he will probably also object to my citing any from Ceylon, in which case there is evidently nothing left for me but to quote *a testimonial from "Darjeeling" himself* as to the general efficiency of the Down-draft Sirocco. This testimonial is embodied in a letter which he, "Darjeeling," in his own proper name, addressed to me personally to Belfast shortly after my Engineer's second visit to his place, and which letter has been forwarded on to me here, it having arrived in Belfast after I had started for India. It is dated—Darjeeling, 21st October 1890, and the following is one of his paragraphs in full, word for word—"I do not wish to run down the Sirocco, which is an admirable machine *and, I believe, the best that has yet been brought out*, but all machines are susceptible of improvement."

He then goes on to give me his ideas of what those improvements should be, and, while I thank him or laying them before me, I must nevertheless decline to accept them in the light of "improvements." For instance, he has a special fancy for putting a *small* pipe on the air exit from the fan. The open area of this pipe he indicates as about 64 square inches, and he says "it does not in the least obstruct the escape of air from the fan." I, however, found it necessary to make this opening with an area of 200 square miles, and yet he reduces it by *more than two-thirds* and wants me to consider this an "improvement!" If it be so, then why not go on reducing it and thereby increase the improvement, till perfection is reached by closing it entirely? I am, however, well pleased with the testimony "Darjeeling" has given me as to the general merits of the Down-draft. To be the "*best* tea-drier that has yet been brought out" is no mean praise to bestow on it.

I feel, Mr. Editor, that I have again trespassed too far upon your valuable space, but I anticipate that in your appreciation of fair play you will excuse me seeing that, throughout this correspondence, I have been, and am still, only defending myself and my inventions against the groundless attacks of men who if they possessed the courage of their opinions, ought not to have been afraid, or ashamed, to put their own names to their letters.—I am, Sir, yours faithfully,

C. S. DAVIDSON.

Calcutta, 23rd January 1891.

[The mass of evidence and independent testimony which Mr. Davidson has adduced in his several letters so fully proves the truthfulness of the statements, published in his advertisements, that we feel sure even "Darjeeling" himself must be now convinced he has been mistaken, and we consider this correspondence may now be closed.—ED., *I. P. G.*]

THE TEA MARKET.

The correspondence in the *Grocer*, discloses the fact that a new element has been introduced into the tea trade, and that there are now, as in other markets, operators for the fall, who are interested as speculators in depressing prices. Facilities for selling "bears," for delivery at a future date, have been given by the inclusion of tea among the articles of produce dealt in through the London Clearing House. Transactions are based upon a "type" of which samples are supplied to all who wish to deal either as buyers for the rise or as sellers for the fall. A "call" is held every day, sometimes twice a day, and prices fluctuate according as buyers or sellers predominate. Operators settle differences on open contracts day by day with the Clearing House as prices change; and as the Clearing House has power to close any operators' account on failure to pay up the difference due, speculation is considered to be made safer, and confined more strictly to those who have means available for the prompt liquidation of losses. On this ground, the formation of the Clearing House is justified by those who support it either as shareholders or as speculative operators through its agency. But a very different view of the whole matter is held by many of the older and most important firms of tea brokers, who (supported by the principle producers, their clients) have steadily refused to associate themselves with the movement or to transact this kind of business, which they deem prejudicial to the best interests of producers. There is reason to think that the value of tea was depreciated unduly in the autumn by the action of speculative sellers, who calculated on lowering prices by persistent selling of tea which at the time had existence only on paper. The "bears," however—who acted on imperfect information, and altogether failed to grasp the altered position of tea—have been caught short of stock, and their efforts to buy back what they have sold have led to a rapid advance in the terminal market. The principal buyers, who have practically cornered the market, are reputed to be substantial firms connected with China. They are strong enough to carry the speculation through, and have now a numerous following of smaller

men, outsiders, and others whose eyes are opened to the remarkable position of tea. The heavy deficiency from China—about twenty-five million pounds—and the short crop from India, have brought to pass what we have always been told is impossible, viz., a real deficiency in the total supply required for the world's consumption. From no source can the scarcity which is beginning to be felt be relieved until the closing months of this year. Hitherto these speculative transactions have been very limited in Indian tea, for the "bears" hesitated to sell; but it is on record that in December the type was quoted under 8d, below its value on the basis of public sale rates, and those who did so have now the option of covering at 10d, or of risking still heavier loss. The situation, from whatever point of view regarded, is an interesting one; as, quite apart from the results of speculation, the elements exist for a rise in the value of tea—possibly of permanent duration,—exceeding the hopes of the most sanguine; rivalling, it may be, the extraordinary rise in the value of coffee which was brought about a few years ago by a somewhat similar series of events. When it is remembered that the price of sound China Congou is still only 7½d per lb.; good Indian Pekoe Souchong about 10 l per lb; really good Pekoes at 1s; and fine tea at 1s 6d, it is clear that there is *room* for improvement, provided there is sufficient *reason* for it, without fear of any material check to consumption.

In the issue of the *Grocer* of the 24th "Broker," replying to letters depreciating tea writes:—

"A Wholesale Dealer," into whose motives we need not enquire, has done his best through your columns to depreciate the value of tea, and has warned your readers against the tactics of speculators, to whom he is pleased to attribute the upward movement of price.

As a representative of producers largely interested in the steadiness of the market, I ask you to let me join issue with this "Wholesale Dealer," notwithstanding that I cannot claim to be specially anxious for the welfare of your readers. On behalf of those who hold strong views about the market, let me say that their basis is this:—

1. The ascertainment that supplies from all sources this season will be at least 15,000,000 lb. less than our requirements, and possibly 20,000.000 lb. less.

2. The knowledge, derived from the most influential sources, that the retailers throughout the country are lightly stocked, and cannot long hold out against rising prices.

3. The opinion that, with the exception of the commonest qualities, teas are at very low prices in the wholesale market as compared with the prices in retail trade, leaving margin for a considerable advance.

4. The fact that home consumption is rapidly increasing, as shown by the duty payments on nearly two and a half million pounds more than last year, between the dates of Jan. 1st to 20th, following on the very considerable increase during 1890.

5. The impression, based on careful enquiry, that the public are largely buying a better kind of tea than before duty was lowered, taking their two pence out in "quality."

6. Experience of the commercial history of the world which teaches us that articles shipped from silver-using countries, in the long run, rise and fall with the movements, in the silver market. With the rupee and the dollar at their present price, it is certain that "common tea" must either rise on price or cease to be produced. The efforts of Indian and Ceylon growers are being turned towards making "finer tea and less of it," in order to combat the higher cost of their crops caused by the rise in silver.

7. The knowledge that (outside the Clearing House clique) there are no speculative holders of tea at all —speaking, of course, in general terms. If "Wholesale Dealer" knows where tea is held as a speculation, perhaps he will indicate it; if the stocks held by dealers who have had the foresight to acquire them be referred to, they are merely the set-off against those who have run short in the hope of prices falling.

In conclusion, let me say why the Indian sales have been so large: it is because Indian importers have been advised for years to sell freely whenever demand is strong and on general principles irrespective of prices or statistics; and they have acted on this advice. Having sold 745,000 packages out of the 1,150,000 packages which will be received, they will now be advised to sell the balance quietly between now and July, and take the average of the market for sales spread over that period.—*H. and C. Mail.*

THE VISIT OF MR. POPOFF, THE RUSSIAN TEA BUYER.—We learn from Mr. Popoff, the Russian tea merchant who arrived here on Friday evening from Marseilles in the "Salazie," and concerning whom we had a paragraph in our last issue, that he purposes staying only a short time in Ceylon prior to proceeding to China on his yearly business visit to the tea markets there. He is accompanied on his tour by Madame Popoff and Mr. Jaeger, and wishes to see one or more of the crack tea properties in the island. He brings letters of introduction to Messrs Aitken, Spence & Co. and they will, no doubt, help him to do this, and no doubt the system of pruning adopted by our planters will be shewn him, as it seems he considers it a matter of special interest. When in China he hopes to visit the tea gardens, and to see for himself what chances there may be for amendment in manufacture of tea in that country. He is somewhat reticent as to his opinion on the chances of Ceylon tea in the Russian markets. This is perhaps only natural under the circumstances, but we may form our own opinions from the hint he throws out—that it is quite possible that the next time he visits Ceylon he may remain a much longer time and not go on to China at all. He met Mr. Rogivue in Moscow and gives a good report of his health and spirits, and speaks highly of his abilities. Before very long we may hope to see Mr. Popoff or his agent resident in Colombo and buying our best teas for direct export to Russian markets.—Local "Times."

GEMMING IN RAKWANE.—Feb. 16th.—A large and successful sale of gems took place at Botiatenne on the 11th instant, several gem merchants from Colombo, Morotuwa, Ratnapura and other places being present at the sale. Among the lots sold, a very valuable sapphire weighing 53 carats was briskly competed for and was eventually purchased by one Mr. Fernando of Morotuwa for R2,700. Besides this gem, two other lots of sapphires were sold for R263 and R204 respectively. Tamby Sinho, the famous gemmer of Rakwane, was the happy finder of these gems, though for some time past he has spent a lot of money without finding a stone of any value. The gems in question were found on Botiatenne, bordering Golden Grove, and there is not the semblance of a doubt but that equally good, and probably better, gems will be found in the grounds of Golden Grove acquired by the Gemming Company. The vicinity has been long known as a spot abounding in gems, and all those that know the place are quite confident that, should operations be commenced there, they would be crowned with success. A few months back a rare sapphire weighing about 20 carats was found at a place close to Golden Grove and eventually fetched about R2,500. It will be very gratifying for all concerned to hear that after all the money spent by Mr. Siedle in the Botiatenne pit he is in a fair way of meeting with success. Under the able management of his present superintendent, Mr. G. H. Carey, a very large quantity of excellent *illum* of the right sort has been raised, all hands are now busily engaged in washing it, and there is every probability of Mr. Siedle meeting with very successful results. The plumbago pit on Barra estate does not seem to yield such a large quantity of plumbago as was anticipated is first, but it is said that a very rich vein of plumbago at in existence at the spot, just on the vicinity of Rakwane. The reports that are received about the finding of gems on Rangwelletenne estate are not very encouraging and most of the gems found are not very valuable.—*Rakwana Cor.*—Local "Times."

TEA CULTIVATION AND RESULTS IN UPPER AMBAGAMUWA.

Our tabular statement of the results of Tea Cultivation in East Matale, has brought us another paper from the other side of the country, namely Upper Ambagamuwa, and the figures there given will surely astonish old planters of coffee in that region. The comparison, too, with even the most favoured districts of the country is very favourable, both for heavy outturn of crop, and economy in working. It will be observed that the Ambagamuwa estate has a splendid rainfall, no less than 210 inches in 1890. The information given in regard to manuring will be carefully considered. Similar statements for typical estates in other districts would be very interesting and useful to men anxious to compare expenditure and receipts. Our correspondent writes :—

It may interest your readers to compare results from the quartz and clay of Ambagamuwa with those from the alluvial deposits of the Matale district in which our friends seem to delight on that side of the country. The following are the figures of crop and expenditure of this estate for 1890, viz :—

Cost per lb. of made tea f. o. b. on—Upper Ambagamuwa—384 acres at lb. 366 per acre, equal to 140,742 lb., at 26·35 cents, equal to R37,094·80 ; plus new clearings· 97, equal to R1,366 29, at 27·32 cents, equal to R38,461·09 total expenditure on estate.

			Cents	R	c
GENERAL EXPENDITURE.					
Salaries and Allowances	140,742 lb.	at	3·89	5,481	60
Contingencies	do	do	·43	587	76
Tools	do	do	·08	109	22
Grass fields	do	do	·06	94	21
Fire Insurance	do	do	·21	300	00
	do	do	4·67	6 572	79
UPKEEP OF BUILDINGS.					
Machinery ...	do	do	·20	287	95
Tea Factory ...	do	do	·10	128	85
Bungalow ...	do	do	·35	432	03
Supplying ...	do	do	·01	26	39
Manuring ...	do	do	·01	9	91
Lines ...	do	do	·06	93	50
	do	do	·73	1,028	63
TEA CULTIVATION					
Roads and Drains ...	do	do	·37	526	51
Weeding ...	do	do	3·28	4,608	00
Pruning ...	do	do	·86	1,214	77
	do	do	4·51	6,349	28
TEA MANUFACTURE					
Plucking ...	do	do	9·29	13,077	98
Firewood ...	do	do	·43	586	19
Factory Labour ...	do	do	1·32	1,869	51
Factory Sundries ...	do	do	·15	207	41
Packing Materials ...	do	do	3·57	5,026	78
Transports ...	do	do	1·68	2,376	20
Tea Manufacture ...	do	do	16·44	23,144	10
Tea Cultivation ...	do	do	4·51	6,349	28
Upkeep of Buildings ...	do	do	·73	1,028	63
General Expenditure ...	do	do	4·67	6,572	79
Cost against Crop ...	do	do	26·35	37,094	80
New Tea Clearings ...	do	do	·97	1,366	29
	do		Ct. 27·32	R38,461	09

The following figures show the yield per acre, from a field Mookalam (¾ grown jungle) planted in 1880 and all dug over (forked) at end 1883, with the result that it gave 1,001 lb. made tea per acre in 1884. It gave

	lb.			lb.	
In 1882...	450	per acre	1887....	676	per acre
'83....	672	do	'88....	589	do
'84 .	1004	do	'89....	8[illegible]6	do
'85....	605	do	'90....	662	do
'86....	530	do			

9 years' average lb. per acre 671½ equal, to 6,045 lb.

Notwithstanding the big yield of 1,001 lb. per acre the year after it was dug, I am of opinion that the field would have shown better results during the 9 years had it not been dug. I believe in digging when the soil can be thatched immediately after, or on flat land, such as Dumbara, Lower Matale, or Kurunegala.

RAINFALL FOR 1890.

	inch.		inch.
January	·63	July	22·58
February	6·51	August	16·46
March	3·47	September	32·12
April	16·52	October	26·04
May	18·98	November	16·58
June	35·38	December	5·57
	81·64		119·35
			81·64
		Total	200·99 inch.

WYNAAD PLANTING NOTES: COFFEE.

Planting has, I regret to say, become of late such a truly dismal subject, that I have positively shied at the idea of discussing it. At present the tiniest rim of silver comes to edge our cloud, for the weather has been unusually propitious, and the spike looks exceedingly promising. It is very dry and hot with us now. The regular old fashion winter suitable for hardening wood and spike, is so far very desirable. But of course such parching heat is very trying to new clearings, and our cattle are suffering terribly already. There has been a tolerably severe outbreak of foot and mouth disease, and this morning I hear of some cases of rinderpest on a neighbouring estate.

I can but give you a woeful account of our past crop season. With the exception of one or two estates, the crop has been past all the experience of the "oldest inhabitant," for badness. Properties which might reasonably have expected 100 tons, have only given 14 and most of us humble ourselves to the level of from 1 to 3 ton crop—and this scarcity has not been alone confined to coffee; pepper has also failed, and the cinchona disease has ravaged splendid fields, in a heart-breaking manner. Paddy has also been very poor and the natives, like ourselves, suffer keenly from the general badness of the times. There is, however, considerable trust still in Ledgeriana cinchona. Formerly it was considered the most delicate variety, but it has proved the contrary and remains healthy in situations where the *succirubra* has died out wholesale. Unfortunately, the bark market is anything but cheering at present. In fact, Mark Tapley would be in his element in Wynaad just now, and I do think we deserve credit for being as jolly as we are under very decidedly discouraging circumstances. It seems to me that pepper, Liberian coffee, and Ledger are our principal supports; but even more than these, undoubtedly, thrives *tea*. There are very many of us whose thoughts are turning seriously to this product. It has been proved beyond a doubt that tea grows splendidly in Wynaad and yields infinitely more freely than on the Nilgiri hills. The difficulties put forward regarding it, are the labour or the capital necessary for starting a new industry, and building factories for the preparation of the leaf. There is a great difference of opinion on the labour question, some pointing out the difficulty we already find in obtaining sufficient hands for working our estates during three-quarters of the year, whilst tea requires a continual and regular supply; others saying that a little extra pay will bring in what we require.—*Cor., Madras Times*, Feb. 16th.

NILGIRI TEA.—It is expected that there will be a grand harvest for Nilgiri tea planters this year. A correspondent writes:—"That very good tea (equal to the produce of Ceylon and Assam) can be produced on these hills has lately been proved by several of our planters. Nilgiri planters require to carefully prune their bushes; to pluck quickly and fine, and to provide ample withering accommodation. 500 pounds per acre is possible on these hills to the careful agriculturist."—*M. Mail.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Feb. 5th.

ANNATTO. Seeds are firmly held, though the price still remains low. For a parcel of 90 bags good bright red Ceylon an offer of 2d per lb. was refused, as being ½d below the limit. Twenty-one bags good West Indian seed sold, "subject to approval," at 2¼d per lb.; damages at 1d per lb.

CINCHONA.—A parcel of 112 bales South American Guaiaquil bark was for the greater part sold today at a decline of about 2d per lb.; bright thin silvery quill 10d to 11d; broken ditto 7d to 8½d; long brown, partly broken quill 5d to 5½d; broken brown stout ditto, and damaged 3½d to 4½d. For a parcel of 45 bales so-called Calisaya, fair bright colour, half hard bald, imported via Hamburg, the price of 9d per lb. was suggested. Sixteen cases East Indian bark, long thin bright druggists' quill, partly mossy Succirubra, sold at 11½d to 12d; and for 13 cases good grey stem quill 1s 2d to 1s 4d per lb was paid.

COCA LEAVES.—Six bales South American leaves were bought in—good greenish but broken Truxillo, of good flavour, at 1s 3d per lb.; thin dull small grey leaves, at 9d per lb.; 8 packages, just arrived from Colombo, were not actually offered.

QUININE.—There has been more business doing this week, about 110,000 oz of German speculative brands, in bulk, having sold for forward delivery (July-September) at 1s per oz. At today's auctions 8,000 oz. Brunswick and 5,000 oz. Zimmer quinine were offered, but only 11d per oz. was bid for them, and the whole was bought in. There are second-hand sellers on the spot at 11½d per oz.

AGRICULTURAL AND TECHNICAL EDUCATION IN THE COLONIES

is the title of a paper by Henry F. Moore, read at the latest meeting of the Royal Colonial Institute, in which we find the following from Ceylon :—

CEYLON.

The Colonial Secretary, Sir Edward Noel Walker, K.C.M.G., has sent me the following excellent report :—

I. General Education.—The population of Ceylon, according to the last census (1881), is 2,759,738. For this population general education is provided in connection with the Government as follows :—

(*a*) 438 schools, with 35,948 scholars, supported wholly by Government.

(*b*) 919 schools, with 66,400 scholars, aided by Government: the Government paying a grant on the result payment system after the annual examination of each school.

There are also 2,427 schools receiving no aid from the Government, representing 28,823 scholars. Of these 1,844 schools, with 12,211 scholars, are Pansala schools—i. e. small schools taught by Buddhist monks in their monasteries. The teaching of English was at one time largely carried on by the Government direct in its own Government schools. It has of late years, however, become in a fair way to be self-supporting; and the schools supported wholly by Government are now nearly all vernacular schools, teaching, *in Sinhalese and Tamil only*, reading, writing, arithmetic, geography and history, with specific subjects (animal physiology, sanitation, agriculture, and domestic economy). The teaching of English schools aided by Government, but not wholly supported by Government, is on the following lines in high schools, the whole of the instruction being given in English; in English primary schools the subjects are taught up to the fifth standard bi-lingually—what is read or written in English having to be translated into one of the vernacular languages, so that a native scholar may gain a full understanding of what is taught.

II. Agricultural Teaching.—(*a*) Generally, the elements of agriculture are taught as a specific subject in Government and aided schools from text-books.

(*b*) Five years ago a special school of agriculture, wholly maintained by the Government, was opened at Colombo, and the students undergo a two years' course of training somewhat on the lines of Cirencester.

After their training is completed, a certain number are paid by the Government, and are sent out as agricultural instructors into remote rural districts, where they lease land and cultivate it on improved systems, receiving half the profits of their crops themselves, the other half being divided amongst the labourers from the village where the cultivation is worked. By this means, what is learned in text-books at school is brought before the eyes of the villagers. I have not been long at work in this direction, as the experiment is new; but some good has been done already in the few years that have been devoted to it, especially as the crops raised by our instructors have generally been double, and often many fold, of the crops raised on primitive native systems; this provokes imitation. These agricultural instructors are moved about the country after raising a few crops, so as to bring their work before as many villages as possible.

PLANTING PRODUCTS.

(From the Thirty-seventh Annual Report of the Ceylon Planters' Association, held 17th Feb. 1891.)

Tea.—The season on the whole has been a satisfactory one especially so in the continued progress made in Markets proving the usefulness of the Tea Fund which paves the way to the introduction of our Teas to all parts of the world. The Ceylon Planters' American Tea Company has been amalgamated with a large American Company and there is every promise of its diverting a considerable share of your Tea to America. A very promising beginning has been made in introducing Ceylon Tea into Russia and you have to thank Mr. Rogivue, who was sent there by the Standing Committee of the Tea Fund, for the very energetic way in which he has set to work. Your best thanks are also due to Lieut. de Frisch for his kind aid in bringing our Tea into notice in Russia, and everything points to considerable progress being made in this Market during 1891. You are also led to expect the advent of Russian buyers to the Colombo Market, and it must be seen to that Teas are sent forward to suit them, which will settle the matter of opening the Russian Market at once. The average for the Home Market was 11d, the same as that of last year; but the Market differed this year from last in that it was a steady one throughout the rise in silver during the latter half of the year, without any compensating rise in the marke value of your Teas has of course been a serioust matter, and growers must trust to the great and increasing demand for our teas to right this in time. The working results of all local Tea Companies have been satisfactory showing excellent returns. The total crop for the year ending 31st December 1890 is 45,799,518¾ lb. or an increase of 11,453,766 lb. as against the same twelve mouths of 1889. The progress made with the Australian and New Zealand markets continues to be most satisfactory, the exports for 1888 being 479,626 lb, for 1889 1,134,156 lb. while for 1890 they are 2,361,433 lb., or more than doubling itself each year. Your Teas taken up by America and Canada for 1890 are 204,223 lb. as against 42,252 in 1889. There has been a considerable increase of Tea coming into bearing during the year and the area now giving yield may be put at 205,000 acres. 1891 will show a still larger increase on this. Tea in many districts has had to suffer from an insufficiency of rain during the South-West Monsoon but owing to the first portion of the year being so favorable the falling off in returns has not been great. A considerable number of properties have changed hands during the year at satisfactory prices. And the enterprise as a whole is on a firm footing with every promise for the future. A further considerable acreage has been planted in tea during the year under review in all the divisions of the principality of Uva, Badulla, Madulsima Haputale, Udapussellawa and the results obtained not only as regards yield but also as regards the quality of the tea compare very satisfactorily

with those obtained in the most favoured parts of the island. The exports for the year 1st January to 31st December 1890 were 45,799,518¾ lb. as against 34,345,752¾ lb for the year from 1st January to 31st December 1889. You are again indebted to the courtesy of the Principal Collector of Customs for authoritative data of the exports of tea from Ceylon, and your Committee has great pleasure in appending it.

Coffee.—During the twelve months there has been a slight falling off in exports of coffee. For the last three years the returns are as under:—

Exports from 1st Jan. to 31st Dec...	1888...cwt.	137,793
Do	1889... ,,	89,694
Do	1890... ,,	90,090

Cinchona—There has not hitherto been the falling off in the production of this drug to the extent that has been expected; large quantities are yearly harvested; neither has there been any improvement in the prices realized which are still ruling at a figure at which cinchona cannot be cultivated profitably. Owing also to increased supplies from Java the Market for Cinchona throughout the past year has remained in a depressed and unsatisfactory condition, the unit of Quinine ranging from 1½d to 1⅝d. During 1890 large areas of land have been cleared of this product more especially in the Uva Country, and tea planted in its place. Little or no planting of Cinchona has been done in Ceylon in recent years. It may thus be taken for granted that the cultivation in Ceylon is not extending. Upon one point therefore no doubt need exist, the cinchona trees are being gradually eradicated, where shaving and careful covering were performed formerly now the tree comes out roots and stem. Harvesting bark in this manner accounts for the shipments being kept up to the still existing large figures but sooner or later a rapidly falling export, will be shown in the meantime the stem and roots of an uprooted tree supplies fully four times the quantity of bark that could be obtained by merely spoke shaving a portion, and thus chiefly, are the large exports maintained. The exports for the year 1st January to 31st December 1890 were 8,779,140 lb against 9,455,641 lb in 1889, 12,482,817 lb. in 1888. Showing a falling of 5,896,523 lb. in 1890 over the year 1886 when 14,675,663 lb. were shipped.

Cacao.—The recurrence of droughts particularly in the older planted districts has affected the out-turn of crop very considerably, and the export has not been so large as last year being cwt. 4,073 short of 1889. The younger districts though fairly realizing estimates have not made up for the deficiencies elsewhere. Helopeltis, Borer, and the other pests continue to give trouble in their season, but the gardens generally are looking well. There has been no great addition to the area cultivated but some pretty extensive clearings about Wattegama have been commenced. The thefts of this product have become very numerous and serious, involving a great deal of trouble and hardship upon managers as well as loss to proprietors. The receivers of stolen produce hardly seems to have the attention of the Police as much as they might. Prices have been satisfactory having ruled favourably during the year, in the closing months they were exceptionally high, Ceylon Cacao still mantaining the premier place in the Home Market. The Exports for the year 1st January to 31st December 1890 were 15,942 cwt, as against 18,949 cwt. for the year 1st January to 31st December 1889.

Cardamoms —Do not generally, except in the districts north of Kandy, receive the attention they did but in those parts which appear specially suited to their growth the cultivation is continued successfully and is being extended. Indeed, it may be safely said that three-fourths of the exports of this spice come from the districts lying to the north of Kandy. In the so called new districts and other parts to the south it is a rare thing to find 10 acres of land now devoted to cardamoms, while in Medamahanuwara and the Nitre Cave extensive clearings exists. It is hardly probable that cardamom cultivation will extend much further or, that the output from Ceylon in the future will greatly increase for the area of the land suited for their cultivation is not large and the rhisomes become exhausted usually after the 7th or 8th year, in the some cases before. The present figures of export may however be maintained for some years to come. The exports for the year 1st Jan. to 31st Dec. 1890 were 395,576¾ lb., against 466,168¾ lb. for the year 1st Jan. to 31st Dec. 1889.

Tobacco.—The cultivation of this product continues to be persevered with. The season has been a most unfavourable one owing to the almost unprecedented drought in all the Tobacco districts. There is no doubt that Ceylon can grow leaf of good quality and give a large yield per acre, but as was the case with our teas at first it will take a little time to find a demand, and the prices so far have not been remunerative owing no doubt partly to defective curing as well as to market prejudice, reports on the Tobacco justifying higher prices than have been obtained.

MINOR PRODUCTS:—*Cotton* has been partially successful and its cultivation is still being carried on both by Europeans and natives. In other parts of the hill country generally however the climate has proved too moist and insects too troublesome to secure any sufficient measure of success.

Croton Seed continues neglected, prices having fallen so persistently low.

Annato has been largely grown, and exported as paste and seed. The market is being overdone and good prices are not now obtainable.

Pepper is being largely planted. It seems a promising article, but so far actual returns have not met expectations.

CUBEBS.—The true plant yielding this valuable berry has still to be introduced into Ceylon, all previous introductions having turned out factitious.

ARECANUTS have cropped well and yielded good prices 1890 being "a lucky year" amongst natives; the demand was good.

KAPOK receives growing attention in the lower districts, but it is doubtful if it would pay as a systematic cultivation.

THE LABOUR LAWS.—In the last Annual Report the Committee saw occasion to congratulate the Association; because efforts which had been extended over nearly two years were thought to have terminated in a legislative measure honorable to employers and employed; and although the law unanimously agreed upon in Council was felt to be in certain points defective and incomplete, it was regarded as the best and most expedient of possible alternative amendments, and not inconsistent with the past traditions and usage which controlled the relationship of the contracting parties. Though it was mentioned in last year's Report that Royal sanction had not then been proclaimed to the Ordinance No. 13 of 1889 which had been unanimously passed in October and had indeed become an operative Law under which cases were decided in the Courts, it was a startling reverse to learn on 16th April, shortly after Council re-assembled, that a despatch dated 29th January 1890 had been received nearly two months previously, not only witholding Royal sanction, but requiring the Governor, if necessary by the vote of the official majority, and whether the official opinions concurred or not, to pass another Ordinance amending No. 13 of 1889 as to its principle. The amending Ordinance No. 7 of 1890 embodying the new principle of terminating the contract by efflux of time, instead of by the amount of work done and wages earned, was passed on 21st May 1890, was allowed by the Secretary of State on 27th June 1890, and was on 15th August 1890 proclaimed and made operative. A meeting of the Association was held in Kandy on 18th April, when the resolution expressing emphatic remonstrance, as reported in the annual proceedings, was passed; and protests with explanations were prepared by the Chairman and the Planters' Representative to be forwarded to the Secretary of State, copies of which are published, as it was felt that the true conditions could not have been fully made known to him. The Ceylon Association in London with several others there interested in Ceylon, were prepared to render such assistance as seemed practicable by means of deputations, &c. At the Committee stage of the amending Ordinance the Planting Repre-

sentative, while continuing to express strong objection to any alteration of the law of 1889, obtained an extension from 30 to 60 days for the period which may elapse after the calendar month expires wherein the wages were earned, before non-payment frees the labourer, without notice or demand, from all his obligations. In obtaining that extension of periods, the Planting Member intimated that he only accepted it as the best means of giving effect to the Secretary of State's orders, and not because he approved of or agreed to the alteration which had been forced upon the Legislative Council. With the greatest difficulty the Association, by the aid of the Planters' Representative in Council had succeeded in obtaining "a fair law with a continuity of the practice of a quarter of a century," conserving to the cooly "the privileges of a daily laborer, combined with continuity of employment" together with absolute security for his wages but the conditions of the law previously set forth in the last annual report are now varied in this, viz;—That it has been made easy for laborers indebted to the Estate to desert (labourers not in debt rarely or never desiring such opportunity), while the thrifty labourer has been in no way benefited. The avowed object of the less acceptable alternative was to provide a "self-acting" process whereby the labourer, without notice and without any preferred demand to be paid his balance of wages, could be relieved at a fixed time of his liability for obedient service; but, as is well known to practical planters, the previous conditions were just as much "self-acting" and were so upon a sounder basis, viz: the claim to be relieved after so much wages earned or work done, instead of merely time passed in nominal service. Hence the necessity for such a provision only existed in the imagination of those who in their minds confused the inability of certain Proprietors when overtaken by ruin some six years ago, to discharge promptly their liabilities, with a suppositious disinclination to do so; for it was not the case that any planter denied or questioned his duty to pay monthly wages when required so to do. Moreover the Ordinance No. 16 of 1884 had already accorded to the labourers a priority lien upon the estate for double the amount of wages which the rejected ordinance permitted to remain outstanding before the labourer could be relieved of his liability as a monthly servant. In thus reviewing the position of this vexed question your Committee cannot but regret that the Officers responsible for the government and administration of the country should have exhibited so defective a knowledge of the prevailing conditions of the case, and a bearing so unsympathetic and narrow in view towards the Planters and estate Owners as a class.

Labour Supply.—In the months of April and May owing in a great measure to the prevalence of influenza and the sickness attendant on it coming as it did when there was most leaf to be plucked the labour was greatly insufficient to the requirements, and a great loss of leaf and consequently of money was sustained by the planting community. This scarcity of labour was increased by the unprecedented and arbitrary action of the Government in wantonly stopping the Northern immigration route, and at the same time imposing vexatious quarantine regulations at Colombo. Representations were made by the Association to the Government and your Committee is pleased to record its appreciation of the very prompt and kindly attention given to the matter by his Excellency the Governor both as regards the stoppage of the Northern route and the quarantine regulations. Your Committee ventures to hope that such vexatious and disastrous checks to immigration will not again be imposed by the Government of Ceylon. Since the throwing open of the Northern route and the introduction of better quarantine arrangements the influx of Tamil immigrants into Ceylon has been considerable and the labour force of the country has been replenished as is seen by the fact that this year the arrivals exceed the departures by 38 242.

Coast Advances.—The question of coast advances has been brought before the Association and a circular has been issued by the Association, the recommendations of which will, it is hoped, commend themselves to the community.

Immigration Services.—Members are well aware that this subject of paramount importance to all Planters has occupied and continues to engage the constant and earnest consideration of your Association. The hardship, great inconvenience and loss endured in the early part of the year under review owing to the sudden uncalled for stoppage of the Immigration Service viâ the North Road is still fresh in your memory. At the same time you will remember that the Steamer Service viâ Tuticorin was rendered practically useless owing to the stringency of the quarantine regulations enforced at Colombo. The action of the Association on that occasion took the form of the following resolution which was passed unanimously at a large and representative General Meeting. "That this Association desires to express its strong condemnation of the late unprecedented action of Government in stopping Immigration on the North Road by recently withdrawing their sailing vessels that have for twenty six years been at the service of our coolies without one day's cessation and which withdrawal has unfortunately created a feeling of mistrust, and has been greatly accentuated by the stoppage of the steamer immigration service from Tuticorin to Colombo by the stringent quarantine regulations at the latter port." Your Committee has pleasure in freely recognizing the great interest and concern that His Excellency Sir Arthur Havelock has since evinced in the whole subject, and the steps taken by his Government to facilitate and where practicable increase the efficiency of the Immigration routes. This was evidenced by the Governor's asking for an expression of your opinion as to the relative advantages of the route viâ the North Road and viâ Tuticorin. Of such vital importance are both routes to your enterprise that it was felt absolutely necessary to pass the following resolution in reply. "That since the Tamils immigrate to Ceylon of their own free will it is imperatively necessary that the existing routes are kept open, and every facility given to the coolies to avail themselves of them." In acknowledging this resolution the Government stated that there was no intention on its part to withdraw any facility or accommodation now given by either route and submitted a proposal for the consideration of the Association as to the feasibility of a supplementary route for Immigrant coolies into the planting districts from ports in India to Hambantota and Wellawaya. Your Committee unanimously resolved that the opening of an alternative route for Immigrants viâ Hambantota would be of the greatest advantage to the planting districts and remitted the matter to a large sub-Committee to enquire into the feasibility of the route and to confer with the Chamber of Commerce regarding the immigration routes generally. That sub-Committee has not completed its labours nor has a report yet been presented; accordingly your Committee would recommend the reappointment of the same sub-Committee to complete the enquiry desiderated which naturally will take sometime and careful consideration. It may be mentioned that the sub-Committee met at Kandy in November in conference with representatives of the Chamber of Commerce and passed the following resolutions:—

(I) That this sub-Committee strongly recommends the establishment of an additional immigration route viâ Hambantota and Wellawaya, provided one of the steam shipping companies will undertake steam communication between Negapatam and Hambantota.

(II) The Secretary of the Planters' Association of Ceylon be authorised to communicate with the various Steam Shipping Companies with the view of ascertaining what arrangements they are prepared to make in order to carry out the proposed new Immigration route and to collect all information in reply to the Colonial Secretary's letter of 6th November 1890 relative to the requirements in the way of accommodation and staff for the establishment of the route from Hambantota to Wellawaya.

(III) That a copy of the above resolutions be forwarded to Government and to the Ceylon Chamber of Commerce.

It is further understood that Messrs. Alstons, Scott & Co., as representing the British India Steam Navi-

gation Co., and others have been requested to address the Association direct on the subject, and to submit their views and proposals in connection with the question as early as possible.

LAZARETTO.—The opening of a lazaretto for coolies arriving at Colombo will it is hoped, increase the facilities for immigration by this route by doing away with any necessity for prolonged detention of steamers conveying coolies; and your Committee would record their appreciation of the prompt action of Government in completing the buildings when the need for doing so was recently urged upon them.

FUEL SUPPLY.—This matter has been prominently brought under your notice by the scarcity of fuel, which is absolutely necessary for the manufacture of tea in some districts. There are as is well-known large reserves of Crown forest but the arrangements so far made have not rendered it possible for the planters to avail themselves of the supply which is now in the hands of the Forest Department. The scheme proposed by that department of setting off certain plots of jungle for the use of various estates is impracticable owing to the inaccessibility of the plots and the conditions imposed. Your Committee trusts that the Government will continue to give their best attention to this important matter which might be to them a fruitful source of revenue by the employment of Sinhalese contractors obtain stores of fuel at accessible depots by the removal of some of the most stringent clauses of the Ordinance relating to the removal of timber and by the lowering of the rates on the Railway for the transport of timber develope a trade which would be beneficial to the revenue, the natives of Ceylon, and to the tea manufacturors. The rules at present in force regarding the supply of Firewood to Tea Estates in Central Province will be embodied in the Book of Proceedings for reference; they will also be found in the "Ceylon Government Gazette" No. 5014 of September 19th, 1890.

HOW MANY CUPS TO A LB. OF TEA?

It was said by a London expert when lately stating the cost per cup of Gallebodde tea sold at 110s per lb.,—"this equals 70 cups only to a lb." Now, what is the proper number of cups of tea to be got from one lb. of tea? What says Mr. Street, the Colombo expert?—*Planter*. [Mr. Street's reply to this enquiry is as follows:—"In reply to the question as to how many cups of Gallebodde Tea would go to the lb., I should say about 100 breakfast cups using the quantity of tea we do for tasting purposes. This would make a cup cost about 10½d at 87s per lb."—or 1s 1-5thd at 110s. —ED. *T. A.*]

TEA AND COFFEE.—It is noteworthy that the reason assigned for the reported increase in the demand of the Parisians for British grown tea is the high price and *inferior quality of coffee* and wine. As regards the high price of coffee, the same may be said of tea, seeing that the duty is excessive, but as to "quality," that is due entirely to the greed of the shopkeeper class, who have ruined the reputation of French coffee by abominable admixture of ingredients worse than chicory. This has been a prolific source of complaint by English travellers in France for some years past.—"Ceylon Advertiser."

GUATEMALA AND SAN SALVADOR.—According to reports which have reached Mexico, Guatemala has equipped for war with Salvador 25,000 men, who are now engaged in gathering in the coffee crop. It is added that hostilities are expected to be declared in the latter half of February, while Honduras will keep in check Costa Rica and Nicaragua if they attempt to interfere, but otherwise will also attack Salvador, which is preparing for the struggle. Both Guatemala and Salvador are stated to be endeavouring to arrange loans.—*O. Mail.*

CANCER AND FUNGI.—It a loose way, many persons have associated this horrible disease with the presence of a parasitic fungus, but the association has never till recently, been experimentally proved. Recently, however, Dr. Russell, of Edinburgh, availing himself of the methods of staining, now so much in use among microscopists, and by means of which different tissues and growths may be readily distinguished one from another, has succeeded in discovering fungus spores in cases of cancer. Dr. Russell considers that this fungus acts like yeast, and, like it, sets up a fermenting process, accompanied by changes in the tissues. Dr. Russell's experiments will have to be repeated by other observers, and if confirmed will lead, it is to be hoped, to some means of combatting this fearful malady.—*Gardeners' Chronicle.*

THE WEATHER AT YERCAUD.—A correspondent writes:—"We are having fine weather these few days, rather unusual for this part of the year. The hot days we had before this reminded us very much of the season in March and planters were apprehensive of there being a thorough failure of crop all round. But the few days rain we got has cheered them up not a little, although it is thought that the season was rather early. It is hoped, however, that the rains would continue; for more rain is wanted to set the blossom. The rain we had on the 19th of last month was thought to do the estates great harm, but the preset rains have tended to bring forward a lot of spikes that were backward then, and in a few days the blossoming season will be over. The weather does not yet look closed up and we are expecting more rain."—*Madras Mail.*

COFFEE SULPHATE FOR LILIES.—Rev. C. Wolley Dod stated recently in the *Garden*, and also at a meeting of the scientific committee, that he has found very good results with commoner Lilies as well as with Roses by the use of sulphate of copper as a preventive. Three pounds of sulphate of copper, which costs whole sale less than *3d.* a pound, are dissolved in water, and two pounds of quicklime, separately. These solutions are then mixed together in ten gallons of water, and splashed upon the young growth, to which it does no harm. "I have found this also very useful for the cure of the mildew (Peronospora ficariæ), which has proved here so destructive to the large variety of Christmas Roses. Another remedy recommended for mildew is to dress the surface of the ground in early spring before growth commences with finely powdered sulphate of iron. One pound is sufficient to mix in a wheelbarrow load of soil, and will dress a large surface. I have seen this treatment recommended in the Kew Bulletin to prevent Potato blight. I have used it for Lilies, and it seems successful.—*Gardeners' Chronicle.*

THE PLANTERS' PRESENT TO THE CZAREWITCH.—The albums of views to be presented to the Czarewitch by the Planters' Association, arrived at Darawella from Colombo during the race meeting, and Mr. L. H. Kelly, the Chairman, being present on the course, a wish was expressed to see it, and he consequently showed it to the Governor and the Czarewitch, informing the latter that it was intended for formal presentation to him in Colombo. H. I. H. however, expressed his willingness to take it at once, remarking that he appreciated the gift very much and would prize it. The presentation consequently took place on the spot. On the silver plate outside the characters "Ceylon, 1891" appeared, and on the inside in gold lettering the fact that it is the gift of the Planters' Association to H. I. H. is recorded. Fourteen of the views show all stages of the tea industries and are those taken by the late Mr. Malcolm Clarke. Some 22 others are by Messrs. Skeen & Co., comprising views of Colombo, Kandy, Nuwara Eliya, tea estates, &c. They are all mounted on black plates with gold edge, and their description is printed below each in gold. The 100 lb. tea in 25 boxes of Ceylon woods like the present, which was given to the Queen will be presented through Lieut. de Frisch

Correspondence.

To the Editor.

ON THE WEST COAST OF AFRICA: BY AN EX-CEYLON PLANTER.

Essnassie, Gold Coast, West Africa, Nov. 23rd, 1890.

Dear Sir,—Today being Sunday, I take the opportunity to write you these lines, as promised. We reached Elmina on Saturday, the 1st instant, after a voyage from London of 28 days. This long time is due to the number of small ports the steamers call at. This port is iu about the same latitude as Galle, and in an old Dutch fort is stationed a Hawsa regiment with *one* European officer in command; he being the only white man in the place, and, of course, acting in all sorts of official capacities. Once a week a Mr. Holmes, District Commissioner, goes over there from Cape Coast and holds Court. They were both very kind to me, but this is just what one would expect if the wish of Government is to open up tho country.

The natives are in many ways like our Ceylon friends, and those in towns just as cheeky. As labourers they are good out of their own country, but not in it—servants are very good and beat tho Tamil appu hollow. The principal articles of export trade are rubber, priced here at 1s to 1s 3d, and palm oil and nuts. They are purchased or bartered for clothes, guns and other articles.

The temperature is about the same as in Kandy, and when at its worst like Colombo, but the evenings are much cooler.

We were detained about ten days at Elmina and then started for this place with our Kroo boys loaded up with tools and stores. I wanted to bring 200 of these labourers from their coast, but I only managed to bring 71 with me, the balance I gave 'books' for. This consists of a letter asking any captain or cruiser to bring a stated number of boys to a stated port and there obtain payment at 15s per head: this price is uniform from the Liberian coast as far as Ockra.

Now about the country: the growth all round beats that of Ceylon, the soil is generally a dark loam for a depth of from 1 to 2 feet, and then a subsoil, as in Dikoya, of a clayey nature. There is just enough slope to permit of good draining, and very little rock; the rainfall and tho temperature are about the same as in Kadugannawa. The price of land is nominal, and Kroo labour is good and cheap, costing about the same as the Tamil. Pepper is found wild, and cacao and Liberian coffee grow well, I hear, but I have not seen them yet. Orobua coffee has not been tried, but I have no doubt it will succeed also; I intend to make an experiment. Roads are rather bad and in parts very swampy. I think that the prospects for planting are far more encouraging here than in Ceylon, for coffee and cacao, when they well grow, are far more remunerative and want less labour than tea, but of course, as is the case anywhere else, capital is wanted to make a start.

I have given away a lot of Ceylon tea, and all like it very much. It 's bosh about Ceylon tea, not keeping, I have some, the lead of which was broken in packing 5 or 6 months ago, and it is still in very good condition. There is not much chance of a trade springing up yet, but I hope to be able to introduce our tea all along the coast before long.—I am, dear sir, yours truly, S. W. GANE.

CEYLON TEA AT £5 10 PER POUND.

London, E. C., Jan. 23rd, 1891.

Gentlemen,—I send you a cutting of a leading article in the *Daily Telegraph* of Jan. 17th on some wonderful quality of Ceylon tea which has excited special interest.

Messrs. Elliot, Lack & Porter inform me "that this lot of tea consisting of three 5 lb. boxes in all 15 lb. was knocked down at public sale for 87s per lb. and subsequently resold for £5 10 per lb to the United Tea Company of 21 Mincing Lane. The special fea'urs was its exceptionally good make and appearance, being almost entirely 'Golden Tips.' The liquor would naturally be fine but not at all commensurate with the *appearance* which was primarily the cause of the high price paid."

On receipt of the above information I went round to see this tea, which was publicly advertised to be on view at the Company's offices.—I met a whole crowd of Ceylon men there who all thought that the sample must have been the result of special picking and most careful manufacture, probably a little at a time and by hand. No doubt the final price was the result of competition in order to secure the sample for show purposes; still great credit must be due to the management which has secured 15 lb. of such wonderful tea, and *Gallebodde* estate has certainly made a name famous for good tea which the proprietors should be grateful for, while it should stimulate their neighbours to improve the quality of their tea by greater attention to the cultivation, picking and manufacture under scientific principles. JOHN HUGHES.

TEA PACKING: LEAD PAPER, SPECIAL PAPER.

London, E. C., Jan. 29th.

Dear Sir,—I have read your editorial on "lead paper" contained in your issue of 8th inst. I hope the public will understand that this lead paper is entirely a different article to the paper I am introducing. I don't wish in any way to disparage the paper entitled "Clark's Patent," indeed it may be an excellent substitute for all I know, but I wish it to be clearly understood that my paper is quite apart from this, possessing no lead about it whatever. Since last writing you, I have received an application to supply a large group of estates in India with it. The proprietor, who is at present at home, inspected the packing of the Elkaduwa chests on their arrival and was so pleased with the satisfactory condition of the tea and the serious saving in cost that he is adopting the paper on his estates.

I think your idea as to forming a Sub-Committee of the Planters' Association to consider such improvements an excellent one, and I trust it will be acted upon. It is the only proper and practical way to bring the matter clearly before the community. Let such Committee be provided with samples of linings recommended as substitutes for the present lead, and having regard to cost, in conjunction with efficiency, report accordingly. In the meantime I am quite satisfied to utilize my own paper, for until anyone can produce a substitute equally efficacious in preserving the tea and showing a further saving in cost over the present of some 50 per cent. as compared with the ordinary lead lining, I don't look for anything better.—Yours faithfully, J. M. MAITLAND KIRWAN.

[We should be glad to know if the whole of the tea of any one estate is packed in this paper. —Ed. *T. A.*]

LIBERIAN COFFEE: PRACTICAL HINTS.

Sir,—Being one of those who rushed into Liberian coffee, a dozen years ago—went out for wool and came back shorn but did so in very good company—I have naturally small confidence in a successful revival of its cultivation even with all the experience gathered in the past time: It would not have been so complete and general a failure over the lowcountry had we known then what we

know now of the character and requirements of the plant. I will certainly not tempt fortune a second time myself under any conditions; but as there are bolder spirits in the field, some of them may possibly profit by the formulating of my experience.

When the plant has had moisture enough to establish itself even in indifferent soil, it flourishes with high promise for the first two or three years unless attacked by hemileia, to which it is even more susceptible than the Arabian kind and succumbs more quickly. It is when it begins to bear that it begins to fail. It does not like the Arabian species respond to the use of the knife, and should neither be topped nor pruned but allowed to grow at its own free will. It can hardly be classed as a "forest tree," but in tolerably favourable situations it may be seen upwards of twenty feet in height. As to climate it probably needs somewhat greater heat than is necessary to the Arabian kind, but it should never be tried in the open in a climate subject to droughts of two or three months' duration, each spell of which leaves it weaker and more bare. The conditions of success in the lowcountry are a deep and tolerably rich soil under the shade of tall forest—the denser the better—that will not interfere with its upward growth. In such a situation the only cultivation required is to exterminate the undergrowth and bury from time to time the fallen leaves, in which case 2 cwt. per acre may be fairly hoped for. W. B. L.

[W. B. L. wrote before he saw about the Peradeniya experiment, but that was on a gardening scale, yielding R444 per acre worth of crop. —ED. *T. A.*]

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, 10th Feb. 1891.

DEAR SIR,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Ceylon tea for four years up to the 19th January 1891:—

EXPORTS OF INDIAN TEA FROM CALCUTTA.

	1891 lb.	1890 lb.	1889 lb.
Export to Great Britain from 1st May to 31st January ...	92,956,313	89,129,802	86,826,585
Exports to Australia and New Zealand from 1st May to 31st Jan..	4,345,120	3,204,962	2,750,773
Exports to America from 1st May to 31st January ...	118,510	164,485	143,409
Exports to other places from 1st May to 31st January ...	971,512	1,329,970	757,722
Total Exports from 1st May to 31st January	98,391,485	93,829,219	90,478,189

—Yours faithfully, S. E. J. CLARKE, Secretary.

"JAMAICA SORREL."

Awisawella, Feb. 4th.

DEAR SIR,—In your paper of 24th ult. (see page 596) I notice a foot-note enquiring what "Jamaica sorrel" is. I believe it is the *Hibiscus sabdariffa* or what is commonly known as *Rozella*. It yields a very good jelly, and if the fruit is not too old a very fair jam. This plant begins to flower in December, the fruit ripening in January and February. Tamil coolies value this on account of its acid leaves, and apparently ignore the fruit. In common with all the Hibiscus family it yields a good fibre, and I have found the roasted seeds a very fair substitute for coffee. In a raw state they are good food for fowls, of a nutty and agreeable flavor. In a former *T. A.* I remember reading that this same plant is much valued in Queensland. The calyces of the fruit are gathered and dried and have a commercial value, besides being used for preserves. A wine is manufactured therefrom.—Yours,

PLANTER.

ROOFING FOR CEYLON: PRACTICAL HINTS; A TREADMILL FOR PRISONER.

Kinmylies, Travancore, 16th Feb. 1891.

SIR,—With reference to your article on Roofing for Ceylon I wish to say that I hear that many Missions and many Native Companies have been making the Mangalore tile all along this coast of India, and that the supply is very large at present.

It occurred to me when the experiments with mana-grass for making tea chests commenced, that if it were successful, a shingle, or tile, made of that or other Ceylon grown fibre, treated like the Willesden patent paper, ought to follow. I think you did once refer to paper-mâché *walls* for bungalows or factories as an idea for the future.

With regard to the question of keeping the Colombo lake full by pumping from the Kelaniganga, I would suggest a treadmill on which the Sinhalese felon might take enough exercise to give him an appetite for that plainer food we hear he now enjoys: but he should be exposed to the public gaze though out of the reach of tobacco and betel.—Yours etc., E. F. DAVIES.

WOODCOCK IN CEYLON.

Algooltenne, Elkaduwa, Feb. 23rd.

SIR,—It may interest some of your readers to know that I shot a woodcock in my jungle this morning. I saw one in the same spot in 1883. —Yours faithfully, A. M. HURST.

MONARAGALA: ITS NEWS AND ITS CROPS.

Koslanda, Feb. 23rd.

SIR,—As an example of "English as she is wrote" the reports of your Monaragala correspondent are admirable, and the persistency with which he urges the appointment of a J. P. is much to be commended.

Further, I entirely agree with him that the district will grow excellent tea, though the fact he mentioned the other day that plucking had been begun on some estates with an average of half a pound a cooly may not be in itself convincing proof of this.

But when he speaks of poor crops and makes sweeping if somewhat inappropriate reference to "Pharoah's lean kine" he should discriminate. There are crops and crops now-a-days, and one product, viz. cacao, is doing very well at Monaragala

A. B.

COCONUTS AND TEA.

DEAR SIR,—I see you have lately been noticing with favour the planting of tea and coconuts together on the same land, in which it appears to me you are somewhat on the wrong side of the line. As a principle nothing is ever gained by the attempts to make land do double duty by planting two or more species of crop, yielding perennial plants as permanent occupants by way

of having more than one string to the bow. If a given piece of land is believed to be unequal to the profitable growing of tea, for at least one generation refrain from planting it with that product. Those who plant tea and coconuts on the same land must have very little confidence in the former and only use it as a means of making something off the land while the main and permanent plant is coming on, but yielding nothing; and if the coconuts thrive, down goes the tea when it has just reached its prime and is yielding a larger profit than coconuts ever will. Tea is a plant that will not yield its product freely under shade ; and at ten years old a thriving field of coconuts throws a dense shade over the whole surface if planted at the usual distance apart. Then as the stems run up the trees shed about 800 heavy leaves twenty feet long annually on every acre, and each one smashes five or six tea plants. This sort of thing is tea cultivation under difficulties, and the object of planting the tea, that of making some profit off the land while the coconuts give none, will be defeated ; for the spread of the coconuts will ruin the tea before it arrives at its full yield, and that before its successful rival yields a nut. To those who would have both tea and coconuts on their land, I say, plant them apart on separate fields, and if you do not believe that tea alone will pay do not plant it. W. B. L.

[Yes : but suppose the coconuts were first planted, and being slow of coming on, tea is added a year or two after and from the third to the tenth year, gives net returns equal to from R40 to R80 per acre without injuring the palms ? And then up to perhaps 15 years gives profitable though less returns. We have heard of at least one place that is likely to do this or something like it.—ED. *T. A.*]

CEYLON TEA IN RUSSIA.

St. Petersburg, 16/28 Jan. 1891.

DEAR MR. EDITOR,—Allow me to offer you my hearty thanks for the book and the copies of the *Ceylon Observer*, all of which I have safely received. I see by the report in the *Observer* that Mr. Rogivue is at last commencing to introduce the tea in Moscow and other places. In St. Petersburg none of my acquaintance, which is a pretty extensive one, have yet been able to purchase the tea. As Mr. Rogivuo cannot be in every place at one time, I should be very glad if he would establish a sub agent here, whom I would be very glad to assist so far as my present duties will permit.

The most suitable person for this post according to the writer's opinion is Mr. Richard Wylie, a well-known broker on the St. Petersburg Stock Exchange.

Mr. Wylie has resided in Petersburg over 20 years and is one of the most influential persons in the British Colony here. As Mr. W— is acquainted with almost every person of importance, he would be a capital agent not only for your tea, but for other colonial productions : coffee, cocoa, cinnamon, cinchona, &c., for which Petersburg is a great market.

Mr W— is the son of a Scotch clergyman and is a gentleman of unblemished reputation. His eldest son is tutor to Lord Rosebery's children. I recommend Mr. W— so strongly to your notice not only on account of his personal qualities, but also because he formerly resided in India and was engaged in the cultivation of cinchona on the Nilgherry Hills where he had 2 estates.

Mr. Rogivue has not yet called for the writer. My idea would be to establish two small shops in Petersburg and Moscow and from these establishments to take orders and sell tea wholesale and by retail. I would have also had a refreshment room adjoining the shop where the public could taste the tea before they purchased it at a moderate charge. These shops would have been small, but furnished and embellished with all the taste and richness the Sinhalese people are so famous for.

Tea could have been sold at this place and small samples distributed gratis until the public had overcome their oldfashioned prejudices. There would have been no risk in carrying out this plan, whereas I am not so confident that the one that has now been adopted is not somewhat too risky.

But it is not for the writer to criticize. I can only wish you and the planters every success, and that you will be able in the future, to seize a large portion of the Chinese tea trade and by means of commerce enterē into more close and friendly relations with the millions of this mighty Empire.—Yours sincerely,

WILLIAM BARNES STEVENI.

P.S.—If you could once get the Russian public to like your tea it would pay (in a commercial sense) to run a railway through Afghanistan and send all your tea to Russia direct by land via Persia or the Transcaspian Railway. India and Ceylon ought to beat China. They are much nearer.

WASTE PRODUCTS : SURPLUS TEA SEED SUBSTITUTES FOR FIREWOOD.

DEAR SIR,—It has often occurred to me that if we only looked about us we might easily find a profitable use for the hundreds of tons of really good tea seed (except for nurseries) which we cannot help growing but for which hitherto no one has suggested a use. I mean, of course, the seed which *will insist* on growing on our plucking bushes.

Some years ago, a planter of my acquaintance having gathered a large quantity of seed for which he could not find a purchaser endeavoured to turn it to account by converting it into oil. He obtained a common village oil-press, and having thoroughly dried the seed for several days in the sun, succeeded in pressing out about 10 per cent of oil which burnt with a clear bright flame in common oil lamps and which the coolies used greedily for their curries, etc. This particular lot of seed, however, having been carefully gathered and husked had cost a considerable sum, and being still valued at R10 per maund, the experiment was pronounced a failure; but with seed worth absolutely nothing and which would cost a mere trifle to gather and prepare, might not the result be very different? Besides I am of opinion that by fermenting the seeds (and perhaps a gentle roasting) the percentage of oil would be considerably increased.

Of course, the time to gather the seeds for this purpose would be when *pruning* a field, when the whole could be stripped off and thrown on a barbacue where it would remain till ready for the press, requiring no further attention except an occasional turning, as all the ripe seeds would fall out of the husks after a few days' exposure, and a few showers would not hurt the seed (for oil) ; hence as I said before the cost of gathering and preparing would be a mere trifle.

Then is it not natural to suppose that the oil-cake of this seed would prove to be the best possible manure for tea, and if so it would also be the cheapest to apply, as a lb. or so would probably be sufficient for each bush?

Having thus found a use for the ripe seeds, we should still have the husks and *unripe* seed of which large heaps would soon be collected. I believe this would make a capital fuel and would probably

burn with a steadier heat and give less trouble to the stoker than common firewood.

Apropos of the *burning* question, weeds and all other vegetable rubbish, if pressed into a tolerably firm brick *while green* and then dried, make a fairly good fuel, being similar to the cakes of cow-dung, the only fuel used by the natives over a large part of India, without the objectionable smell.

Mana grass, if cut green and treated in the same way, would, I believe, be equal to the *best firewood.*

A common wooden press, all of which could be made up on the estate (except the screw and worm), would answer this purpose.

Of course, all the above suggestions are more or less problematical, but I give them in the hope they may lead to some practical results by provoking a discussion and perhaps causing experiments to be made.—Yours truly, WASTE NOT, WANT NOT.

CINCHONA BARK CROP IN JAVA.—We have received from the Soekaboemi Agricultural Society their table of statistics of the cinchona bark crop in Java for 1890 and 1891. Of 114 private estates enumerated, the greater number furnished statistics of area, outturn, amount of quinine sulphate in bark, &c. The result of these statistics is to show that in 1890 the actual outturn of bark from private and Government gardens together was about 3,000,000 kilograms containing an average of 4 per cent of quinine sulphate, equal to 120 000 kilograms of quinine sulphate, or about half of the world's annual consumption; while the estimate for 1891 is 3½ million kilos of bark containing an average of 4 per cent of quinine sulphate, equal to 140,000 kilos of quinine sulphate, or nearly 4-7ths of the world's annual consumption.

TOMATOES.—As a result of experiments and observations carried on at the Agricultural Experiment Station, at Cornell University, Ithaca, New York, Messrs. Bailey and Munson conclude that:

1. The Tomato plant is quickly susceptible to careful selection.
2. As elsewhere in the vegetable kingdom, the character of the plant as a whole appears to have more hereditary influence than the character of the individual fruit.
3. Very heavy manuring does not lessen productiveness.
4. Neither nitrate of soda nor muriate of potash alone are profitable Tomato manures upon thin soil.
5. Very early setting of stocky plants in the field, even in dark and raw weather, augmented earliness and productiveness.
6. Seedlings gave far better results than cuttings.
7. Trimming the plants lightly late in summer gave a greatly increased yield.
8. A double or monstrous flower upon a young plant is no indication that succeeding flowers upon the same plant will be double, and produce irregular fruits. But varieties which habitually bear double flowers are also the ones which habitually bear irregular fruits.
9. Cool and dark weather in early fall, and early fall frosts, are the leading drawbacks to profitable Tomato culture in the North. To avoid these dangers as much as possible, plants must be started early and forced rapidly.
10. The essential general points in profitable Tomato culture are these:—Careful selection and breeding; early sowing; frequent, or at least, occasional transplanting to obtain stocky plants; rich soil, well prepared and well tilled.
11. There is evidence that varieties of Tomatos run out, even under good culture.
12. The best market Tomatos appear from our tests to be Ignotum, Favourite, Bay State, Atlantic, and perhaps Ruby among the red varieties; Beauty, Mikado, and possibly Potato Leaf, among the pink or purple varieties; Golden Queen among the yellow sorts.
13 Among the novelties, Ruby and Chemin Market are most promising.—*Gardeners' Chronicle.*

THE TRAVELLING AMERICAN'S FASHION OF MAKING TEA is as follows:—Little perforated silver balls are filled with the dry tea and, being suspended by a chain, are allowed to remain in the cups of boiling water as long as may be required. This mode of preparing tea obviates the risk that callers often run of drinking overdrawn tea.—*Madras Mail*, Feb. 19th. [The silver egg for making tea is a very old invention.—ED. C. O.]

THE JAVA COFFEE CROP.—According to a telegram from the Governor-General of Netherlands India, dated Jan. 31st last, the next Government coffee crop in Java is estimated at 359,648 piculs which is considerably more than in the preceding year; but further information must be waited for, as the first estimate in 1890 was also much higher, and afterwards great disappointment was occasioned. —*L. and C. Express*, Feb. 6th.

TO PREVENT SLIPPING OF BELTS.—Edwin A. Kimball, instructor in the shops at the University of Illinois, says on this subject:—"I do not know that washing soda may not be as good as castor oil, for I never used the former; but I do know that castor oil is effective and safe in the hands of a competent person. There is no occasion to soak a belt in any sort of oil. A little applied to the surface is sufficient. There is nothing that I have ever tried that is so effective as castor oil, especially for wood-working machinery belts. The way to apply it is to let it run from a bottle in a small stream on the belt while this is in motion, commencing at one edge of the belt, moving the stream over a little at every full travel of the belt, until the width of the belt has received its portion. I know of belts that have been treated in this way for years, and they are whole yet, and doing their work without a murmur.—*Engineering and Iron Trades Review.*

THE AMERICAN FARMERS' ALLIANCE.—Mr. Polk, the President of this body, formulates its demands as follows:—

A system of finance which recognizes and secures to every citizen of this country an equitable, fair and just right to share its benefits, and which will furnish a volume of circulating medium, adequate to the legitimate demands of the country, at a low rate of interest, is the greatest and most urgent need of the times. Let the people here represented continue to reiterate and with increased emphasis demand:

First, That silver shall be restored to its dignity and place as a money metal, with all the rights of coinage and all the qualities of legal tender which gold possesses.

Second, That the currency of the country shall be issued direct to the people at a low rate of interest and without discrimination, and shall be a legal tender for all debts, public and private.

Third, That taxation shall be more nearly equalized by requiring that all property shall bear a just proportion of its burthens.

Fourth, That alien ownership of land should be resisted and prohibited.

Fifth, That public transportation should be owned and controlled by the government.

Sixth, That no class nor interest should be taxed to build up any other class or interest.

Seventh, That public revenues should be limited to an honestly and economically administered government.

And for the further security of the public welfare let them demand:

Eighth, A just and equitable system of graduated taxation on incomes.

Ninth, The election of United States Senators by a direct vote of the people.

These demands are the necessary and legitimate outgrowth of our rapidly advancing civilization, and the highest considerations for the public weal and safety should impel us to earnest and persistent endeavour to engraft them upon our governmental policy.—*Florida Despatch.*

TEA AND COFFEE SUBSTITUTES.

So long ago as 1883, I contributed to the *Gardeners' Chronicle* a few notes under the head of "Tea and its Substitutes." These notes appeared on pp. 802—3 in the number of June 23, vol. xix., new series, and on pp. 765—6 in the number for December 15, vol. xx., new series. What was there stated as to the interest of the subject might be repeated here, notwithstanding that seven years have passed since those notes were written, during which time many more plants have come to my notice having similar uses in different parts of the world.

Many changes have taken place in the growth, cultivation, and trade of tea proper during the seven years that have elapsed, and other countries have entered the market as tea producers since that period, the demand for the dried leaves of Camellia theifera increasing with the supply. The return of Christmas, when an extra good cup of tea is often included amongst the items of good cheer, seems an appropriate time to return to this subject, not that we think any of those plants to be enumerated would commend themselves for actual use amongst the bulk of our readers, but a record of them will indicate how varied are the sources from whence a refreshing—or, in some cases it may be a medicinal—beverage is obtained.

Twenty-four distinct plants were described in the former notes, and they were arranged under their respective natural orders. The same arrangement is continued in the following notes, and the numbering taken up from thence.

Berbericeæ. 25. *Caulophyllum thalictroides*, Michx. —A perennial herbaceous plant, with a tuberous root, and stems about 1 foot. It is found in mountainous shady woods in South Carolina, where it is known as Blue Cohosh. The plant also occurs in Japan and Mandschuria. The seeds, when roasted, are said to form an excellent substitute for coffee, for which purpose they are used by the natives in North America.

Frankeniaceæ. 26. *Frankenia* (*Beatsonia portulacifolia*, Roxb.).—This is one of the few indigenous plants in the Island of St. Helena, and the genus was named in honour of Beatson, who wrote an account of St. Helena. It is found on rocks by the sea on the south side of the island. The flowers and flower-stalks, when simply dried, are of a brownish colour, and are known as St. Helena tea. There is a sample of this tea in the Kew Museum which was gathered in 1868, and still possesses a strong aroma similar to Chinese tea.

Geraniaceæ. 27. *Geranium incanum*, L.—A plant with trailing stems. Native of the Cape of Good Hope. In Natal the leaves are used as tea under the name of Natal Wild Tea. There is a sample in the Kew Museum, which was obtained from the Natal Court of the Colonial and Indian Exhibition of 1886, and it possesses a smell not very dissimilar to that of ordinary tea. There is a sample of this in the Kew Museum.

28. *Monsonia ovata*, Cav.—An herbaceous plant of the Cape of Good Hope, where it is known under the name of *Keita* by the Hottentots. The roots and herbs of the plant are very astringent, and are used at the Cape in dysentery; an infusion or tea is made from them, used among the Fingoes to promote abortion.

Leguminosæ. 29. *Sebania occidentalis*, Pas.—In the Kew collection is a sample of the long slender pods of the above-named plant, gathered on the banks of the River Magdalena, and labelled "Wild Coffee, Café de Brusca or Chiliuchile."

30. *Abrus precatorius*, L.—This well-known plant, which is found in nearly all tropical countries, and whose seeds are so generally known as crab's eyes, appears at one time to have had a reputation as a tea plant, for Lunan in his *Hortus Jamaicensis*, quoting from Beecham, says:—"I know a gentleman in Jamaica that made a tea of the leaves, and drank of it many years, which he said kept him in good health."

31. *Cassia mimosoides*, L.—This plant is referred to in a list of economic vegetable products exhibited in the Cape of Good Hope collection of the Colonial and Indian Exhibition, 1886, as being used at the Cape as a substitute for China tea, under the name of Bushman's or Hottentot tea.

32. *Acacia myrtifolia*, Wild.—A tall, glabrous shrub of New South Wales, Victoria, Tasmania, and South and West Australia. The leaves are said to be sometimes used as tea.

Amongst other leguminous plants, reference may be made to Psoralea grandulosa, which, however, was referred to in our notes in December, 1883. In addition to what is there stated, it may be said that in the Mauritius the plant has not only a medicinal reputation, but is also used as a substitute for Tea. It appears, further, to have been at one time an article of import to this country, judging from a note by Twedie in the Kew Herbarium, where it is said that the plant was "good for disorders of the stomach," and that "large quantities were carried to England and sold as Radical Tea in the Radical Times."

Two other leguminous plants have recently been used in France in the composition of medicinal teas, under the names of "Thé des Alpes Maritimes," and "Thé Purgatif des Apennins." The first is a composition of broken leaves of a plant which cannot be identified, a few Senna leaves, and a free use of the flowers of Anthyllis vulneraria, and perhaps Colutea arborescens; the second contains a larger proportion of Senna leaves, flowers of Anthyllis vulneraria, and florets of Centaurea cyanus. Whether these flowers possess any direct properties in themselves, or are put in to improve the appearance of the so-called tea, or increase its bulk, is a question not easy to solve.

Rosaceæ. 33. *Acæna sanguisorbæ*, Valet.—A native of Australia, and found in all the Colonies except Western Australia. Maiden, in his *Useful Native Plants of Ausatralia*, says:—"The leaves of this plant have been used as a substitute for tea, and have been highly spoken of by some for this purpose."

34. *Rosa canina*, L. (Dog-rose).—Of this wellknown plant, Sowerby says, in his *Useful Plants of Great Britain*, that the leaves have been used as a substitute for tea.

Saxifrageæ. 35. *Saxifraga crassifolia*.—Under the name of Mongolian tea, the leaves of this plant are said to be used by the people of Siberia.

Myrtaceæ. 36. *Verticordia pennigera*, Endl.—Under the name of native Tea, the flowers and leaves of this plant were shown in the West Australian Court of the Colonial and Indian Exhibition in 1886, with a note to the effect that the taste not unlike that of ordinary tea, and that the settlers in the earlier days of the colony used it as a tonic and blood purifier. There is a sample of this in the Kew Museum, which has a faint smell of Chinese tea.

37. *Kunzia Mulleri*, Benth.—The dried leaves of this plant, which have a similar smell to the lastnamed, were likewise shown in the West Australian collection in 1886, where they were simply described as native Tea, possessing the same medicinal properties as the Verticordia.

Melastomaceæ. 38. *Cremanium theezans*, D. C.—This genus is now placed by the authors of the *Genera Plantarum* under Miconia. It is a tree from 12 to 20 feet high, a native of damp places about Popayan, where the leaves are infused and drank in place of tea by the inhabitants. Boupland says: "We have often drunk with pleasure the infusion of the Melastoma theezans. It has the colour of tea, and is much less astringent, but more aromatic; many persons would doubt less prefer the drink to tea, and I think it will be found as useful in most cases."

Turneraceæ. 39. *Triacis microphylla*, Griseb., which is now put into the genus Turnera, is said to be used in Hayti as a tea plant, under the name of Thé de Lasca hotas. A small sample of this tea is contained in the Kew Museum.—J. R. Jackson, Kew. —*Gardeners' Chronicle.*

A Substitute for Quinine has been found in the extract from the root of a shrub called *Pambutano*. According to the *Medical Press and ircular*, the aqueous decoction of this root has proved a remedy in cases of malarial fever where quinine failed. The active properties of the root are obtained by its maceration in alcohol at 60deg. Fahr. The alkaloid has not yet been isolated.—*Globe*.

THE DISCOVERY OF SPONGE BANKS of a considerble extent and of great yield at Lampedusa. Trapani, Egadi and Pantelleria has come very opportunely and will no doubt exercise a beneficial influence upon the shipping and labouring classes of the coast. The quality of the article brought from Lampedusa is of the very best, and these new supplies will no doubt influence prices all round and everywhere.—Naples, Italy Dec. 11.—*American Mail.*

SARAWAK TEA has been reported on as follows: —"A sample of the Matang tea was handed to an English firm last month. They report upon it as follows:—'We carefully return your most interesting sample of Sarawak tea which we have this morning liquored and are delighted and surprised with it. The preparation and make of this tea are very much to be commended and the liquor we think would have been most marketable had proper precaution been taken in sending one the samples in *soldered up tin*, for the leaves seem to us at present to be in process of decay, we think if this tea had been sound, it should have fetched in Mincing Lane, about the same money as two parcels we recently bought, and of which we enclose samples, the Ceylon at 10d and the Indian at 9d.'"—*B. N. B. Herald.*

ENTOMOLOGICAL SOCIETY, Feb. 4th.—Mr. C. J. Gahan called attention to a small larva which he had exhibited at the meeting of the Society on the 1st of October last, when some doubt was expressed as to the order to which it belonged. He said that Prof. Riley had since expressed an opinion that the larva was that of a dipterous insect of the family Blepharoceridæ, and might probably be referred to *Hammatorrhina bella*, Löw, a species from Ceylon.—Mr. C. O. Waterhouse exhibited specimens of *Scyphophorus interstitialis*, a Mexican species, and *Accraius comptoni*, a Ceylon species, recently taken by Mr. Bowring in his greenhouse. He also exhibited, on behalf of Miss E. Sharpe, a specimen of *Daphnis hypothous*, Cramer, a native of Borneo, Java, and Ceylon, caught some years ago at Crieff, N. B. The specimen had long been confused with *Chærocampa nerii*, under which name its capture was recorded in the *Entomologist*, xiii. p. 162 (1880).—*Athenæum,* Feb. 14th.

CACAO CULTIVATION IN PERU.—Up to a recent date the cultivation of cacao in Peru seems to have been confined more especially to the Transandine slope, in the province of Convencion, in the department of Cusco, not, however, in sufficient quantities to supply the markets of the southern departments of the Republic. The cacao produced is of a superior quality, and could compete advantageously with best descriptions raised at Soconusco and in Venezuela. The excellence of the bean is, however, rather due to the geological and topographical conditions of the valley of Santa Ana than to the efforts of the cultivators—the cacao goes by the generic name of Cusco cacao—but, owing to the cost of production, distance from the sea, and deficiency of transport, cannot compete in price with that imported from Ecuador, consequently the production and consumption does not extend beyond what is requisite for the local demand. Cacao of good quality has also always been raised in the province of Jaen, in the department of Cajamarca, and the cultivation of the plant extends towards the seaboard in the north of the department of Piura, but upon so limited a scale as scarcely to amount to more than an experiment. With a more extended development, cacao could easily be produced in sufficient quantities for the internal consumption of Peru, displacing export from abroad, and perhaps even competing in foreign markets; a future for the industry which appears more than probable when the contemplated irrigation scheme in the department of Piura shall have been carried into effect.—*Foreign Office Report*, Oct. 8.

A BIG AMERICAN PRODUCE COMPANY.—Messrs. S. V. White & Co, New York; Messrs. John H. Davis & Co., New York; Messrs. Connor & Co., New York, are authorized to offer for subscription one million dollars of preferred eight per cent. Cumulative Stock mentioned below. Thurber-Whyland Company. Organized under the Laws of the State of New Jersey.—*New York Press*, Jan. 16.

THE FINEST TEA, in Oriental estimation, is gathered from shrubs which have been kept shaded for three weeks, so that the leaves are partly etiolated or blanched. It is called "flat tea," because the leaves are not rolled they are merely steamed and are never touched by the hand but turned over by the aid of a bamboo stick. After steaming they are merely dried. There is nothing in this process to justify the high price demanded for the tea. A Japanese chemist, Y. Kozai, assistant in the Agricultural Chemical Laboratory, has analysed this tea and found that it contains 30 per cent more theine than the tea made from leaves grown in the sun. The work done by the chemist appears to be reliable. He analysed the natural leaf and the same manufactured into black and green tea. The chief difference he found was in the quantity of tannin, which was large in the natural leaf and in the green tea, but very much smaller in the black tea. He maintains that there is nothing injurious in faced tea the Prussian blue being only 1,000th part of the weight but he is severe in his condemnation of the practice of mixing with the tea the leaves of other plants.—"Ceylon Advertiser."

CEYLON EXPORTS AND DISTRIBUTION 1891

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total	Cinchona. 1891 B'nch & Trunk lb.	Tea. 1891 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1891 cwt.	Coconut Oil. 1890 cwt.	Pl'bago. 1891 cwt.
To United Kingdom	14300	...	14300	972664	9256694	6852	26480	164258	4221	7240	...	22887
" Marseilles	...	...	...	...	1676	39	...	21200	...	...	...	...
" Barcelona	...	...	...	...	1700	...	...	36000	...	...	...	...
" Genoa	...	...	...	...	100	...	...	28700	8400	...	394	...
" Venice	...	...	...	...	...	...	...	...	...	...	...	...
" Trieste	372	...	372	...	210	...	...	...	2250	951	...	...
" Odessa	...	...	...	...	...	...	...	...	...	...	...	...
" Hamburg	...	...	...	...	...	77	...	37100	...	1304	...	5066
" Antwerp	18	...	18	26662	...	...	...	...	...	200	...	...
" Bremen	...	...	...	...	1645	...	...	...	...	...	...	...
" Havre	...	...	...	...	...	...	...	...	...	...	...	...
" Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	...	...
" Africa	...	...	...	...	2985	...	...	...	...	...	...	...
" Mauritius and Eastward	11	...	11	...	15514	...	...	...	...	1025	329	...
" India	260	637	897	...	14367	...	25888	10080	...	15053	7108	10
" Australia & New Zealand	1096	301	1397	...	391251	...	40	1000	2240	603	6	...
" America	...	...	...	141545	20159	791	...	12000	...	11013	...	37892
" Stockholm	...	...	...	...	...	...	...	...	...	...	...	...
" Constantinople	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 2nd March 1891	16057	938	16995	1162309	9708301	7759	55108	310338	17111	37389		65855
Do 1890	33322	744	33966	1198231	6094278	4768	80479	255937	57748	7827		44147
Do 1889	20580	1680	22260	1945314	4045699	5396	70270	307217	36919	65126		78035
Do 1888	36316	1274	37590	1284206	2602197	4653	57247	160249	147958	51769		38973

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, January 29th, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
ALOES, Socotrine	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic	Common and good ...	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red...	Renewed	2d a 1s
	Medium to good Quill...	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a 1½d
BEES' WAX, E.I., White	Good to fine	£6 a £7
Yellow ...	,, ,, ...	95s a 115s
Mauritius & Madagascar...	Fair to good	95s a 112s 6d
CARDAMOMS—		
Allepee	Fair to fine clipped ...	1s a 2s 2d
Mangalore	Bold, bright, fair to fine..	1s 6d a 3s
Malabar	Good to fine plump, cliped	2s a 2s 6d
Ceylon. Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s a 1s 6d
	Small to bold brown ...	1s a 1s 6d
Alleppee and Mysore sort	Fair to good bold ...	2s 6d a 3s 6d
	,, ,, medium ...	1s 6d a 1s 10d
	,, ,, small ...	1s a 1s 4d
Long wild Ceylon...	Middling to good ...	6d a 2s 2d
CASTOR OIL, 1sts	White	4¼d a 4½d
2nds	Fair and good pale ...	3⅝d a 3¾d
3rds	Brown and brownish ...	3¼d a 3½d
CHILLIES, Zanzibar ...	Fair to fine bright ...	42s a 45s
	Ord'y. and middling ..	37s a 40s
CINNAMON, 1sts	Ord'y. to fine pale quill...	7d a 1s 5d
2nds	,, ,, ,, ,, ...	6d a 1s 1d
3rds	,, ,, ,, ,, ...	5¾d a 1s 2d
4ths	Woody and hard	5d a 10d
Chips	Fair to fine plant ...	2d a 6½d
CLOVES, Zanzibar and Pemba.	Fair to fine bright ...	3⅞d
	Common dull and mixed	3d a 2½d
,, STEMS	Common to good ...	⅞d a 1d
COCULUS INDICUS ...	Fair sifted	12s a 13s
COLOMBO ROOT... ...	Good to fine bright sound	20s a 27s 6d
	Ordinary & midling ...	16s a 20s
CROTON SEEDS, sifted...	Fair to fine fresh ...	10s a 15s
CUTCH	Fair to fine dry ...	24s a 32s 6d
DRAGONS BLOOD, Zanzibar ...	Ordinary to good drop ...	50s a 90s
GALLS, Bussorah & Turkey ...	Fair to find dark blue ...	52s 6d a 57s 6d
	Good white and green ...	40s a 50s
GINGER, Cochin, Cut ...	Good to fine bold ...	75s a 80s
,,	Small and medium ...	40s a 52s 6d
Rough...	Fair to fine bold ...	35s a 46s
,,	Small and medium ...	26s a 32s 6d
Bengal, Rough	Fair to good ...	18s
GUM AMMONIACUM ...	Blocky to fine clean ...	20s a 50s
ANIMI, washed ...	Picked fine pale in sorts,	£12 a £14
	Part yellow & mixed do.	£10 a £12
	Bean & Pea size ditto ...	£5 a £7 10s
	Amber and red bold ...	£10 a £12
scraped...	Medium & bold sorts ...	£6 10s a £11
ARABIC E.I. & Aden ..	Good to fine pale frosted sifted	60s a 80s
	Sorts, dull red to fair ...	35s a 55s
Ghatti ...	Good to fine pale selected	45s a 55s
	Sorts middling to good...	23s a 33s
Amrad cha.	Good and fine pale ...	60s a 100s
	Reddish to pale brown ...	25s a 50s
Madras ...	Dark to fine pale ...	15s a 55s
ASSAFŒTIDA	Fair to fine pinky block and drop	26s a 38s
	Ordinary stony to midling	16s a 25s
KINO	Fair to fine bright ...	35s a 37s 6d
MYRRH, picked	Fair to fine pale ...	£6 a £8
Aden sorts	Middling to good ...	70s a 85s
OLIBANUM, drop...	Fair to fine white ...	30s a 45s
	Reddish to middling ...	22s 6d a 30s
,, pickings..	Middling to good pale ...	12s a 20s
siftings ..	Slightly foul to fine ...	10s a 15s
INDIARUBBER	Red hard clean ball ...	2s 2d a 2s 5d
	White softish ditto ...	1s 5d a 2s 1d
East African Ports, Zanzibar and Mozambique Coast	Unripe root	1s 3d a 1s 10d
	Liver	1s 3d a 2s
	Sausage, fair to fine ...	1s 10d a 2s 1d
Assam,	Good to fine ...	1s 8d a 2s 3d
	Common foul & middling	9d a 1s 6d
Rangoon	Fair to good clean ...	1s 10d a 2s 2d
Madagascar, Tamatave,	Good to fine pinky & white	2s 2d a 2s 7d
Majunga and Nossibe	Fair to good black ...	1s 8½d a 2s 1d
ISINGLASS or FISH MAWS Tongue..	good to fine pale ...	2s 9d a 3s 8d
	dark to fair ...	1s a 2s 6d
Bladder Pipe...	Clean thin to fine bold...	1s 6d a 3s 6d
Purse ...	Dark mixed to fine pale	6½d a 1s 8d
Kurrachee Leaf ...	Common to good pale ...	1s 9d a 3s 10d

EAST INDIA *Continued* East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS.
INDIGO, Bengal ...	Middling to fine violet...	4s 6d a 5s 7d
	Ordinary to middling ...	3s a 4s 3d
Kurpah	Fair to good reddish violt	2s 8d a 3s 5d
	Ordinary and middling...	2s a 2s 6d
Madras (Dry Leaf).	Middling to good ...	2s 6d a 3s 1d
	Low to ordinary ...	1s 6d a 2s 3d
IVORY—Elephants Teeth— 60 lb & upwards ...	Soft slightly def. to sound	£70 a £76
over 30 & under 60 lb.	,, ,,	£64 a £71 10s
40 a 100 lb. ...	Hard ,, ,,	£50 a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,, ...	Hard ,, ,,	£25 a £33 10s
Billiard Ball Pieces 2¼ a 3¼ in	Sound	£75 10s a £83 10s
Bagatelle Points ...	Sli. def. to fine sound ...	£66 a £75
Cut Points for Balls	Shaky to fine solid sd..	£54 10s a £73
Mixed Points & Tips...	Defective, part hard ...	£35 a £53 10s
Cut Hollows ...	Thin to thick sli. def to sound	£30 10s a £37
Sea Horse Teeth— ⅝ a 4½ lb.	Crvd. crkd & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Bhimlies I, good & fine pale	11s 6d a 13s
	,, II, fair pickings	7s 3d a 8s 3d
	Jubblepore I, good & fine	11s a 12d
	,, II, fair rejections ...	7s 6d a 8s 3d
	Vingorlas, good and fine	9s a 10s 6d
Madras, Upper Godavery	Good to fine picked ...	10s 3d a 11s
,, ,, ...	Common to middling ...	7s 6d a 9s 3d
Coast	Fair	8s 9d a 9s 3d
Pickings ...	Burnt and defective ...	4s 9d a 6s 3d
MACE, Bombay ...	Dark to good bold pale...	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,, ...	64's a 80's	2s 10d a 3s 3d
	83's a 180's	1s 6d a 2s 9d
NUX VOMICA Cochin, Madras and Bombay	Fair to fine bold fresh	10s a 12s 6d
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour..	¾d
LEMONGRASS ...	,, ,, ,, ...	1½d a 1¾d
ORCHELLA WEED Ceylon ...	Mid. to fine, not woody	20s a 25s
Zanzibar ...	Picked clean flat leaf ...	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER—		
Malabar, Black sifted ...	Fair to bold heavy...	4 3-16d a 4¾d
Alleppee & Tellicherry	,, good ,, ...	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO, Lump ...	Fair to fine bright bold	15s a 21s
	Middling to good small...	11s a 14s
Chips ...	Sli'tly foul to fine bright	9s a 12s
Dust ...	Ordinary to fine bright...	4s 6d a 7s 6d
RED WOOD	Fair and fine bold ...	£3 a £3 10s
SAFFLOWRE, Bengal	Good to fine pinky ...	55s a 70s
	Ordinary to fair ...	25s a 50s
	Inferior and pickings ...	15s a 25s
SALTPETRE, Bengal ...	Ordinary to good ...	16s 6d a 17s
SANDAL WOOD, Logs...	Fair to fine flavour ...	£35 a £60
,, ,, Chips..	Inferior to fine ...	£9 a £30
SAPAN WOOD	Lean to good bold ...	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 82s
SENNA, Tinnevelly ...	Good to fine bold green...	6d a 8d
	Medium to bold green...	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a 1½d
Bombay ...	Ordinary to good ...	1d a 2½d
SHELLS, M.-o'-P. ...	EGYPTIAN—med. to large	85s a 97s
	small and medium.	90s a 100s
	oyster and chicken	90s a 100s
large	BOMBAY—fine thick ...	95s a 105s
medium and large	bright fairly clean	92s 6d a 107s 6d
small and medium	,, ,, ,,	90s a 105s
chicken	,, ,, ,,	85s a 100s
oyster and thin ..	,, ,, ,,	82s 6d a 100s
Mussel	ordinary to fine bold	28s a 60s
Lingah	Sorts...	3s a 10s
TAMARINDS	Mid. to fine blk not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
TORTOISESHELL ...	Fair & fine clean heavy	19s a 30s
Zanzibar and Bombay	Low thin to mid. clean	7s a 18s 6d
TURMERIC, Bengal ...	Leanish to fine plump finger	14s a 15s
Madras ...	Fin. fair to fine bold brgt	16s a 18s
,, ...	Mixed middling... ...	15s a 16s
,, ...	Bulbs	10s a 12s
Cochin ...	Finger	11s a 12s
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in.	14s a 20s
Mauritius, 2nds...	Foxy & reddish 5 to 8 in.	10s a 15s
Seychelles, 3rds...	Lean & dry to mid. under 6 in. ...	7s a 10s
Madagascar, 4ths...	Low, foxy, inferior and pickings... ...	3s 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for March :—

WATER IN SOILS.

WATER exists in soils (1) in chemical combination as ferric and aluminum hydrates, and hydrated silicates, and (2) in mechanical suspension as hydrostatic, capillary, and hygroscopic water. Water in the first condition is found generally at the bottom of soils, and being quite free to obey the law of gravity, it sinks down and is found in the drainage.

Taking up the subject of water in mechanical suspension: permanent hydrostatic water or "bottom water" is that reached when soil is excavated, as in the construction of wells : it is the source of capillary water. Where hydrostatic water exists at a shallow depth, the soil is not of the most profitable nature, unless it be first brought under a thorough system of drainage. Capillary water is held in the pores of the soil by capillary attraction, and is then not free to obey the law of gravity. Its source as before stated is hydrostatic water. Capillary water is of the highest value in keeping soils in a condition of healthy moisture, and its presence can be readily detected in soils.

Hydroscopic water in ordinary circumstances cannot be perceived. Its presence is detected by heating air—dried soil to 100° and holding a cold surface over it to condense the moisture. The loss in weight suffered by the soil through this operation indicates the amount of hygroscopic water it contained. The amount varies considerably in different soils : it usually increases in any one soil during night, and decreases during day. The hygroscopic property of soils or the power of absorbing water vapour from the atmosphere depends on the chemical and mechanical condition of the soils, as well as on the temperature of the air. Organic substances are more hydroscopic than mineral substances ; for instance wool will vary 10 per cent of its weight on different days, and that there would be an advantage in selling silk and woollen goods by weight. The power of soil in absorbing water vapour is generally in the same ratio as that in which it absorbs other gases, such as ammonia. In respect of hydroscopicity soils vary much. Silicious soil may be practicably said not to possess the property at all, calcareous sand shows it in a very slight degree increasing about 3 per cent of its weight, while a good loamy soil absorbs on an average 3·5 per cent, clay 5 per cent, and humus 12 per cent. The green manuring of sandy soils increases their hygroscopic power, and in fact the addition of any organic matter to silicious soils brings about this desirable result. The dryness or humidity of the air affects the rapidity with which soils will absorb water, while the temperature regulates the amount of water absorbed. During the day, when the temperature is high, moisture is lost, and gathered at night.

The capacity of retaining moisture that has been absorbed is also greatest with humus and least with sand. According to Schlœsing's experiments as given by Warrington, fine sand saturated with water and thoroughly drained, retained 7 per cent, a clay soil 35 per cent, a forest soil 42 per cent. Additions of organic matter will thus increase the retentive as well as the absorptive power of soils.

Capillarity depends on the porosity of the soil. In sandy soils the pores are large and the hydrostatic water is little drawn up. In a clay of medium texture capillary action is at a maximum, but if the clay be too 'heavy,' the water cannot ascend. The order for capillarity is as follows :—ordinary clay, humus, garden soil, sandy soil. In sandy soils though there is little capillarity, the water is drawn

up fast but not to any height. Evaporation is greater in a soil when it is occupied by a crop than when bare, and the faster the growth the more evaporation will there be. This will be better understood when it is borne in mind that plant food is taken into the growing plant in a state of solution, and that it is the evaporation of the water in the higher parts of the plant and the consequent concentration or thickening of the crude sap that causes the less dense solution of water and mineral matter to pass upwards, by the law of diffusion. In bare land capillarity and therefore evaporation is favoured by a tolerably dense condition of the soil. The operation of ploughing or otherwise breaking-up this soil tends to diminish the amount of evaporation by disturbing the conditions favourable to capillarity; evaporation is also diminished by the presence of stones on the surface of a soil.

OCCASIONAL NOTES.

A meeting, at which was present Mr. Schwann, M. P. for North Manchester, was held at the United Service Library on Thursday the 5th Feb., with a view to considering the subject of Technical Education for Ceylon. Speeches were delivered by Mr. Schwann, the Assistant Colonial Secretary, and others. We had not the pleasure of listening to these speeches, not having had the honor of an invitation to be present on the occasion. We found on enquiry from one of the promoters of the meeting that it was to be of the nature of a "private conference," though it subsequently turned out to be a very public affair, there being present newspaper reporters and a number of students and others. The gentleman referred to was good enough to express a wish to see us at the meeting, but we did not feel justified in being present under the circumstances. It struck us as rather peculiar, to say the least of it, that it should not have been thought proper by the conveners of the "private conference" to invite us, as solely representing technical education in this city. In one way it was fortunate that we were not of the large assembly that met at the Fort Library on the 5th, as we were thus enabled to dispassionately review the speeches delivered on the occasion through the columns of the press, unaffected by the enthusiasm that prevailed at a meeting patronised by an M. P. and a Manchester man to boot.

It is undoubtedly a great matter to hear a man of Mr. Schwann's experience of technical education, deliver himself on his pet subject: but it was a pity that those who should have seconded the efforts of the speaker by helping him to apply the general principles of technical education which he enunciated, to the special case of Ceylon, should have in their enthusiasm forgotten their part. The late Director of Public Instruction, however, as an old educational hand, spoke warily, while Mr. Ferguson's practical letter which was sent to the meeting, was very opportune. A meeting such as this, as giving a fillip to the public of Colombo, cannot but have a good effect; but it is to be hoped that the committee of the Association, which sprung into existence at the meeting, will keep the fire of their zeal burning till they attain the object of their existence as such.

The urgent necessity there is for constructing and repairing small village tanks has been much dwelt on of late. There are cases within our knowledge of cultivation being entirely at a standstill in places where it existed to a satisfactory extent, owing to the tanks in the neighbourhood supplying no appreciable quantity of water in dry seasons, if any at all. In some of these places it is practically beyond the power of the cultivator to get water from wells owing to the abnormal depth to which he must excavate before he can tap a water-bearing stratum. It is, however to be hoped, from the warmth with which the subject of irrigation is being thrashed out, and from the import of the visit of the Director of Public Works to India, that science will before long come to the aid of the inhabitants of these parts where nature is so hard a mistress.

Common ginger *(Zingiber officinale)* says the Kew Bulletin, as is the case with so many cultivated plants, is unknown in the wild state, but there is little doubt that it is a native of Asia. It was known as a spice to the Greeks and Romans, who received it by way of the Red Sea, and supposed it to be a production of Southern Arabia. It was very early introduced into the West Indies, from which it was shipped for commercial purposes to Europe as early as the 16th century. The dried ginger met with in British commerce is almost entirely derived from the West Indies, Sierra Leone, Egypt and India. It is noteworthy that none is sent to the British Isles from China.

The Kew Bulletin contains a note on Chinese ginger which is exported so largely, preserved in honey. For a long time there has been great doubt as to the plant which produced the large flat finger-like masses which were unlike anything produced by *Zingiber officinale*, the deterent cause in deciding this point being the difficulty in getting the plant to flower. It has been stated never to flower in China. Dr. Trimen, who received some roots from Kew, succeeded in growing the plant, but could not induce it to put out an inflorescence; and the same was the result at Kew. Now we hear from two quarters, viz., from Dominica and Hongkong, the Chinese ginger plant has flowered, which turns out to be *Alpina Galanga*, the greater galangal, a plant originally a native of Java and Sumatra and now much cultivated in India for its rhizomes.

The stem eelworm (*Tylenchus devastatrix*) is a minute, transparent, white threadworm, at its full growth scarcely more than $\frac{1}{25}$ of an inch in length, and its greatest breadth may be said in a general way to be $\frac{1}{40}$ of its length. Miss Ormerod recommends that, when a crop is affected by the eelworm, dressings of sulphate of potash, or mixtures of sulphate of potash and sulphate of ammonia, will be found successful in stopping attack, if applied as soon as the first

beginnings of deformed and stunted growth are observable.

At the late Tasmanian Agricultural Conference, Mr. E. H. Thompson, in reading his paper on Entomology, drew attention to the valuable properties of the *Pyretheum* as an insect destroyer. "This plant," he said, "which forms the basis of all insect powders is easily grown, and is harmless to plant life. The Washington department of Agriculture report that they have found it most effective in destroying insect life, even the most impenetrable scale insects. Every farmer and orchardist should have his patch of pyretheum, whether *pyretheum carneum, roseum,* or *purpureum.* The flower heads, the upper shoots and leaves, should be carefully cut and harvested, and then an infusion made by pouring boiling water on them, just in fact as tea is made. . . . . One ounce of the dried herb should make about 3 gallons of the infusion."

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Rubiaceae.

47. *Hedyotis Nitida*, W. & A. Sin. Pitasudupala.

Is a herb growing in both cultivated and uncultivated places. In cultivated places the plants grow luxuriantly and thrive well in fertile spots. The stem is much divided, soft and round, having a pale green colour with pink marks at the nodes. The leaves are ovate and are fleshy. The upper surfaces being pale green, whilst the under surfaces are of an ashy white colour, whence the Sinhalese name Pitasudupala. The flowers which are small and of a pink colour, are borne in clusters. The very small fruits are angular with a mottled appearance, and a slight sticky secretion on the surface.

The leaves of this plant are used as a food: it is eaten along with rice both boiled and in the form of a curry. The whole plant is believed to possess certain well-marked medicinal properties, and is specially valued as a blood purifier. It is also used in nervous diseases and in intermittent fever.

48. *Mussænda Frondosa.* L. Sin. Mussenda.

Grows in the uncultivated places in the warmer parts of the Island. It is a shrub generally from six to eight feet in height. The leaves are green with prominent nerves, branching from the midrib, placed almost equidistant from each other. This gives to the leaves a sort of freckled appearance. The peculiar characteristic of the plant is the white-coloured bracts. These bracts resemble leaves, but are a little larger in size and are of a pure white colour: they occur along with the flowers. The flowers of this plant are of a purple red colour and are very small. The fruits are of the size of ordinary myrtle berries, but of an oval shape; they are jet black when ripe.

The part used as food in this plant is the white-coloured leaves or the bracts. These are fried in oil and eaten along with rice. The young leaves are also used for dry curries. The leaves are used medicinally as local applications to allay swellings.

NOTES FROM A TRAVELLER'S DIARY.

After the failure of Coffee a great many of the natives of Kotmale have taken up the cultivation of Cardamoms in right earnest, and many have got large profits by this industry. The aspect of the district, its climate and rainfall, favour the growth of the plant, and some of the gardens that I visited are a sight worth seeing.

It takes about 3 years for the plant to bear, and the expenses of putting an acre under cultivation, and also for weeding the land during a period of 3 years, will come to about R80, according to an estimate given to me by a proprietor of some large cardamom plantations in Kotmale. About R160 worth of cardamoms could be gathered from an acre for a year, and the plantation will continue to give a high crop for over a period of ten years.

Two distinct varieties are cultivated, viz., Mysore and Malabar. On the Mysore variety the flower stalks or panicles given off from the root of the plant stand erect, while in the case of the Malabar variety they creep along the ground. The Mysore variety is far superior to the Malabar; its fruits are bigger and they fetch a higher price. The natives, however, prefer the Malabar variety, because it gives a better yield. I saw a few plants of another variety which give off flower stalks both from the top of the stem and the root.

Kotmale is as noted for its cardamoms as Dumbara is for its cocoa. In both districts the cultivation of these plants form the principal industry of the natives.

The cultivation of arecanuts ought to receive better attention from the native community of the hill districts. These districts, as a rule, are unsuitable for coconut cultivation. Arecanuts thrive and bear well on the hill sides, and therefore the Kandyans ought, I think, to pay the same attention to the cultivation of this plant as the lowcountry natives pay to the cultivation of coconut. It takes about 8 years for the arecanut tree to come into full bearing, and each tree will give an income, on an average, of about 50 cents a year from the time it begins to bear.

One great evil in native gardening is want of method. It is sickening to see a garden planted with all sorts of trees but without any order or regard to the growing and feeding space that should be allowed to each tree. There is much to be taught to the goiyas even in the elements of Practical Agriculture. We look to the School of Agriculture for the required improvement in this direction. Agricultural Instructors ought to be sent about the country. They could learn much themselves while imparting useful knowledge, and do an immense deal of good to the country by introducing useful products from one district to an other, and showing the people how to grow them.

I wish all Village Schoolmasters were trained agriculturists. We would have had them as such if, as the founder of the School of Agriculture

intended, we had the Normal School also in connection with this useful Institution.

I find that the late Director of Public Instruction has expressed his regret at the closing of the Normal School in several of his reports. Is it too late now to have a class for training teachers also at the School of Agriculture? Now that there is to be a Technical School, it would be advisable to have a class for training teachers in Agriculture and Technology.

There is little hope of teaching Scientific Agriculture to the old goiyas. We must begin with school boys. Every schoolmaster ought to have an experimental garden in connection with his school. If he is a trained agriculturist, he will know what to grow and how to grow. A taste for gardening and a desire for competition could be created in the minds of the boys by holding annual exhibitions and awarding prizes. For all these we ought to have teachers of the right stamp. They could only be got by proper training.

THE CULTIVATION OF GINGER.

(Zingiber Officinale.)

By W. A. De Silva.

The ginger plant thrives in warm and temperate climates. It is herbaceous in its nature, but the plant is not an annual, though it is treated as such in cultivation.

The ginger plant was known from times far remote, and ginger was an article of import among the Greeks and Romans. It is supposed by some that the original home of ginger is the country bordering the Red Sea, as it was from the Red Sea ports that the spice was exported. But on the other hand there is every reason to believe as evidenced by historical records, that India was the original home of the plant. The generic name Zingiber is derived from the Sanscrit. At the present day the ginger plant is cultivated to a large extent in India, Cochin, Africa, and Jamaica.

The plant is said to attain to the height of from three to four feet, but in Ceylon we do not see it grow to more than half that height.

The cultivation of ginger is carried on in the villages of Ceylon to a small extent as a garden crop. The villages in the vicinity of Cotta produces a large quantity of ginger rhizomes.

As this plant thrives well only on very good soils and produces well under good treatment, the cultivation is confined to small patches on which the cultivators can bestow the care and attention the plants require for their successful growth. However, it is a very paying crop, and on that account the extension of its cultivation is very desirable.

In cultivating ginger in Ceylon, the land is well tilled and covered with leaf refuse which is afterwards burnt. After the process of burning, all pieces of unburnt twigs and bits of root are carefully removed, and the ashes are well mixed with the soil. Then beds are made 3 feet in breadth, and sometimes double that size, from 12 to 24 feet in length as the case may be. After these beds are carefully levelled, the sets of ginger are planted at distances of nine by twelve inches. The sets are selected from thin rhizomes which are cut into small pieces, leaving one or more buds which spring up a few days after they are planted.

The planting done, the beds are covered with old straw or leaf refuse; the former is preferred, as it could be evenly spread without much difficulty. This process is of great aid to the growing ginger, as by it a check is given to the growth of weeds which, if permitted to establish themselves at this stage of cultivation, are sufficient to spoil the whole crop. Besides, it helps to retain a certain amount of moisture by preventing excessive evaporation in dry weather, and in due time when the plants are most in need of manure, the straw or leaf refuse supplies this want after a process of decay.

Ginger is generally planted by the end of March and April, and the crop is obtained in ten to eleven months. The soil is then dug up and the rhizomes, commonly called roots, are gathered.

A large quantity of ginger sets is necessary for planting purposes, an acre of land requiring from six to ten hundredweights. The results are generally very encouraging, as the yield is from ten to twelve fold yielding eighty to hundred cwts. per acre. Ginger is seldom, if ever, dried by the cultivators of Ceylon. The produce being so limited, it is all consumed in a raw state. The price of a pound of ginger varies from two to eight cents according to the supply in the market.

Ginger is used in all countries as a condiment and a medicine possessing carminative properties. Indian and Sinhalese medical works abound in the uses and the praises of this medicine, and it is known as *Maha-Awushadha*, or the great medicine.

As a commercial product it is known in a dried state; and in chemists' shops is sold in the form of a powder,—the dried root being known as race (*rais*) ginger. There are two kinds of dried ginger, one of a brownish colour and the other white; the white ginger is produced by bleaching the rhizomes in chloride of lime.

The cultivation of this product in an extensive scale would no doubt prove to be a profitable one in some parts of the Island where the soil is rich and the rainfall favourable. It may perhaps be also cultivated with success under irrigation, and its cultivation is to be recommended in the neglected soils of the tank districts.

The curing of ginger for market purposes is very little understood here. When merely boiled and dried in the sun, the rhizomes shrivel up, and turn black. The following process is said to yield very good marketable ginger, and is the process adopted in Cochin and other countries where a large export trade exists.

"The rhizomes of ginger when dug out are thoroughly well scrubbed in water with a hard brush until every particle of earth is removed and then steeped for a night in a pretty strong solution of limewater (one ounce of unslacked lime to the gallon), then well rinsed in clean water and dried slowly."

BUILDING MATERIALS.

Section II. Timber.

By a Factory Apprentice.

There are nearly 90 timber trees in Ceylon, but the following are the chief and the most

extensively used, and with which almost every Ceylonese architect and carpenter is well acquainted.

Halmililla is extensively used for carts, waggons, house buildings, tubs and casks. This wood is the best for oil casks in the island. On account of its fine grains it is chiefly used for works which have to bear great strains: its durability is from 10 to 80 years.

Palu.—The colour of this timber is a dark red, it is largely used for bridges and buildings, and it can also be safely used for underground purposes. It is the second heaviest wood (Na being the first) in the island: its durability is from 10 to 70 years.

Buruta.—The colour of this timber is a yellowish white, it is extensively used for bridges, waggon wheels, bullock carts, oil presses, buildings and furniture: it durability is from 10 to 80 years.

Na, known as iron wood, resembles Palu in colour, it is the heaviest wood (from whence the name iron wood) in the island. Its durability is from 10 to 60 years; it can be used for bridges and buildings, and oil can be obtained from the nut.

Suriya is a timber admirable for carriages, hackeries and gunstocks, but is not so durable as halmililla.

Ramanidella is a timber used for common house buildings. Very durable fences can be made from sticks.

Teak.—There are three different kinds of teak: *Ceylon teak, Cochin teak,* and *Moulmein teak.* The first-named is extensively used for bridges and buildings, the second and third for waggons, carts and arrack casks; it is used for arrack casks because the wood imparts a fine colour and flavour to the arrack.

Coconut is an excellent timber for fancy boxes and furniture.

Mal Buruta.—Next to Calamander this wood is the most valuable; it is excellent for furniture.

Kalumediriya (Calamander) is a scarce and beautiful wood, the most valuable for ornamental purposes in the island.

Kaluwara.—A very valuable wood largely used for furniture.

The following woods are used for underground purposes:—*Galmendora, Beriya, Buruta, Kaha Mililla, Keta Kala, Mi, Mian Mililla, Muruta, Palu.*

NOTES FROM INDIA.

(Being translated extracts from letters by a Sinhalese gentleman.)

The cultivation of the "King" orange is carried on to a large extent in India. These oranges are of excellent quality, and are of the size of an average husked coconut—the price of each fruit being about 3 cents. King-orange is cultivated most commonly in the hill district, and there is no reason why it should not grow well in Ceylon and become a favourite fruit, proving at the same time more paying than our "Sweet-limes."

Gram (cicer) is extensively grown in many parts of India. If it can be successfully grown in Ceylon, it would be better that the amount required for home consumption should be produced in Ceylon than that large sums of money should leave the Island to pay for the exported article.

Large quantities of pomogranate, which is largely produced in Persia, are brought over to India. These pomogranates have a splendid flavour, and are superior to anything we have in Ceylon.

[We have to thank Mr. Hemachandra Jayakody, of Galahityawa Vernacular Boys' School—the writer of the above notes—for a packet of king orange seeds, some of which have been put down at the School of Agriculture, the rest having been distributed. Mr. Jayakody, we understand, is visiting India to study Sanscrit literature. We hope he will continue to jot down any point of interest to us in his travels, and let us have the benefit of them.—Ed.]

THE GRAPE VINE.

(Vitis Vinifera.)

1. Botany and General Description.—This is a trailing deciduous hardy shrub belonging to the natural order *Ampelideae,* and climbs by means of tendrils. The leaves are alternate, deeply serrated, commonly divided into three and sometimes five lobes, and have long foot stalks. The flowers, arranged in lateral clusters in the form of a raceme, are of a greenish white colour and have a fragrant odour. The calyx is cut into five segments, and the petals, which are whitish and five in number, soon drop. The fruit is a one-celled round or oval berry with a smooth skin. The colour of the berry may be green, white, red, yellow, amber and black, or a blending of two or more of these colours according to the variety. The fruit should enclose five small heart or pear-shaped stones, but as a rule it seldom contains more than three seeds. The size and consistency of the grape vary much according to circumstances.

2. History.—The age to which the vine will attain is very great. It is supposed to equal, if not surpass, the oak in point of longevity. Vineyards have been known to flourish for hundreds of years, and the vine is said to have been cultivated from the time of Noah. The native country of the vine is considered to be Persia or the South of Asia Minor. From there it passed into Egypt, Greece and Sicily: from Sicily to Italy, Spain and France. It was probably introduced to England by Roman Catholic Monks or Fathers in the third century. To Ceylon and to Jaffna in particular where it thrives so well, it must have also been introduced by them during the rule of the Portuguese. Even at the present day some of the Roman Catholic Fathers are found to be expert in Viticulture. As an instance of this, I quote as follows from "Notes from a Traveller's Diary," on page 22 of the last September number of this Magazine, where the writer speaking of Father Assauw's garden at Wahakotte says:—"What struck me most was a robust grape vine, which had been grown experimentally, laden with fruit. * * * Father Assauw, encouraged by his success, is about to extend his vineyard."

3. VARIETIES.—The varieties of the vine are very numerous, partly from its antiquity, partly from the influence of climates and soils in changing the qualities of grapes, and partly from new sorts being procured from seed by cross-fertilisation. Horticulturists base their classification of grape-vines on the character of the stems, shoots, leaves, flowers, bunches or berries. Clemente, a Spanish writer, describes 120 varieties, comprising them in two sections, downy and smooth-leaved. The Hamburgh and Muscat or Alexandria varieties are among the best.

E. T. HOOLE.

Haputale, 23rd Jan. 1891.

(To be continued.)

NEWS FROM OLD BOYS.

Mr. H. D. Juanis writes:—

Nildandahinna, a village of Walapane, contains only about thirty dwelling-houses, and is forty miles distant from Kandy. The inhabitants who are a very poor and ignorant lot, depend chiefly on kurakkan and Indian corn cultivation. The soil is rich, and is generally of a clay-loam nature. Paddy-fields occupy many of the hillsides, and are laid out in terraces which are irrigated by streams from above: these fields, however, are not very profitable. This month (February) is the sowing time for the maha crop, the weather being now, as it was last month, very wet. The rains extend from December to April. During the latter part of last year I visited a place known as Lemesuriergama in Uda-Hewaheta, and prepared nurseries and land for tea, coffee, cotton, arecanuts and paddy, and supervised the laying down of land under grass. The transplanting of the paddy ought to be done now, but is being delayed for want of water, which is a great drawback in that part of the country. The work of cutting a canal from Bodi-ela has been suspended for a time owing to washing away of a part of the excavation by heavy rain a little time ago. The Nildandahinna experimental gardens, known before as the Relief Gardens, Walapane, were originally planted with different varieties of cotton, castor-oil, tobacco and grass. Now they contain dhall, arrowroot, sweet potatoes, betel, yams and native vegetables, and I am preparing more land for sugarcane, tea, &c. I am intending to plant some breadfruit trees which I have applied for. I put down ¾ seer paddy in a nursery last month, and the seedlings will be shortly transplanted into a field which is being prepared for them at present.

The Assistant Government Agent, Nuwara Eliya, is making a noble effort to improve the condition and prospects of the unfortunate inhabitants of this district.

Mr. William Abeysuriya writes:—

Since my arrival in Weligama I have been engaged in cleaning land for tea, sugarcane and dhall. In some parts of my property Indian corn thrives well. In this district citronella is largely grown, and I intended planting up a portion of my land with it. Paddy cultivation is carried on with success though under the old system: and I am trying to introduce the new system of cultivation.

GENERAL ITEMS.

Prof. Wallace has for some time been adopting the plan of delivering a course of about thirty lectures on Agriculture to a batch rural of schoolmasters every year, so as to better equip them for the work of teaching agricultural science in the schools of the county districts.

Any housekeeper, according to the *Journal of Health*, ought to be able to detect the adulteration of milk without trouble. Let her take a long slender bottle, cleanse it well, and let it dry out. If then it is filled with milk and allowed to stand in a cool place for forty-eight hours, all the foreign fluid will be precipitated, that is, it will settle to the bottom of the bottle. The soured milk will then fill the middle of the bottle, and the fatty substance will be found floating on the top. Sometimes the top will be a layer of cream, then will come a layer of albumen, another artificial device to make the milk look rich; then will come the soured milk, and at the bottom will come the foreign water. The whole scheme of deception can be read at a glance, and though this sort of work is not scientifically satisfactory, it will always bring out the fundamental fact—whether or not the milk is normal.

The story told of Lord Hopetoun's housekeeper, announcing on his arrival after absence from home, that his emu had laid an egg, and that as his lordship was away she (the housekeeper) had put it under the biggest goose she could find, is matched by that told of Lord Rosebery to whom a county schoolmaster who was seeking patronage for a literary work, wrote asking permission to make mention of his lordship's name in his pamphlet on "insect pests."

Two Doctors of Nantes claim to have discovered another cure for tuberculosis, and base their method on the well-known fact that goats are incapable of being infected with tuberculosis. The theory of these Doctors is that inasmuch as the blood of goats must possess prophylactic properties which protect them against tubercular disease, the transfusion of the blood of those animals into that of human or animal sufferers from tuberculosis must give to the latter power to resist the attack of the malady.

Mr. R. Hedger-Wallace, late of Edinburgh and Glasgow, and a student of Prof. Wallace of the University of Edinburgh, has, we learn from an Australian paper, been making a lecturing tour through Victoria and Tasmania.

The second year students at the School of Agriculture include Johannes, Dias, Vairamuttu, Perera, Salgado, Amarawickrama, and Dias Bandaranayake.

The following are the new boys admitted in January:—Dias, Ayaturai, Fernando, Nallatamby, Athapathu, Kehelpannela, Abeyesekere, Banda, Savarimuttu, Kumarasinghe, Alwis, Gunewardene, Romail, Perera, and Thiedman—the last three being day scholars.

At a meeting of the Agricultural Improvement Society held in the School Reading-room, Mr. E. M. Johannes read an interesting paper on "The Fruit-trees of Ceylon."

Among the visitors at the school last month were Rev. Dr. Sheshadri, and his son Mr. Sheshadri, M.R.A.C., a distinguished agricultural student. The two gentlemen were on their way from Bombay to Japan, and intend doing a trip round the world.

Received with thanks for the School Museum, 2 fossil shells (gasteropods) and a head carved in limestone, both from India, the gift of L. E. Blazé, Esq.

Acknowledged with thanks, St. Thomas's College and Richmond College Magazines. The former has just entered on its eighteenth year.

Erratum—In January number: in first article, line three, for *south* read *youth*.

THE
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THE BOTANIC GARDENS OF CEYLON.

FROM Dr. Trimen's interesting Report, of which we give the main portions as a special Supplement with this issue of the *Tropical Agriculturist*, we gather, that during 1890 quite a number of plants, which are enumerated, flowered for the first time in the Peradeniya Gardens. Amongst these was that wonder of the vegetable world, the Coco-de-mer palm, to which the eccentric speculations of General Gordon have added a new interest. The abstraction of the flower is discreditable and vexatious. Some readers may need to be reminded that the seed of this palm takes no less than *ten years* to ripen ! A specimen of the most imperial of all the palm tribe, the talipot, is, visitors will be glad to learn, in full blossom in the Gardens at Peradeniya. The rainfall at this place, 1,600 feet above the level of Colombo and on the banks of our greatest river, was 82·18 inches, or about 2½ inches under the average, that average itself being lower by 2½ inches than that of the Colombo rainfall. The visitors to Peradeniya (mostly strangers) numbered 1,454. A new and enlarged edition, the 3rd, of the interesting Handbook has been prepared. Large space is devoted to the beautiful mountain gardens at Hakgala, for which Mr. Nock has done so much during the nine years of his incumbency. A bed of the comparatively rare and striking red balsam, *Impatiens Walkerii*, has been added to the attractions of the Gardens, and the grand fernery has been entirely remodelled and greatly improved. With reference to the complaint that there is no demand for 3,000 plants of English oak which are available, and that the Botanical Department has not sufficient means to plant them out, surely this is a work which the Forest Department ought specially to undertake. Planted pretty closely, the trees might be thinned out and their quality as fuel tested. An Assam oak, *Quercus serrata*, has been found by Mr. Gammie of the Darjiling Cinchona Plantations to yield a superior fuel when quite young, and this species will be tried in Ceylon, as we had received notice of the posting to our address of 6 lb. of the acorns, just before we sat down to pen this notice. An Indian oak having given such results, the English oak is surely worthy of a trial. It is here, of course, of quicker growth than in its native habitat. When are we to see the Forest Department utilizing on a large scale, for arboreal experiments, the vast tracts of patana land stretching in all directions from Hakgala and Nuwara Eliya ?

As we noticed at the time, May 1890 was remarkable at Hakgala for a wealth of floral beauty. On one day 610 distinct species and varieties were in flower, including 60 distinct varieties of roses of which some had hundreds of flowers. Tourist visitors have greatly increased, the names for 1890 numbering 1,319. Elk, porcupines and hares have waged annoying warfare against some of Mr. Nock's plants, and sportsmen ought to wage war against these specimens of our fauna in turn. The monsoon weather of the year was abnormally light in wind and rain, with more thunder, however, than had been observed for 9 years. The air temperature went down to 40° on 23rd December, the thermometer on the grass marking 37°. Sharp frosts occurred at Sita Eliya, close by. The maximum temperature of the air was 78·2 on May 12th. The mean temperature ranged from 58·6 in December, to 66·2 in May. The rainfall for the year was only 70·97 inches, less by 16·55 inches than the average. Interesting details are given regarding the Tropical Gardens at Henaratgoda, with a climate hotter by nearly 20° than that of Hakgala, and in connection with the dying of plants in the Anuradhapura Garden, we get a vivid idea of the series of "terribly" dry years, which have nearly evaporated Kalawewa to dryness and left the tanks at Anuradhapura to suffer in sympathy. The Badulla Garden is fast becoming attractive, the one drawback being the ravages, especially in nurseries, of the termites—the "white ants" of non-scientific parlance. Interchanges of plants and seeds have been on a diminished scale, and Dr. Trimen expresses anxiety to see private nurserymen relieve his department of the task of making up wardian cases of plants. The wonderful progress of tea is contrasted with the decadence of coffee, of which only 86,000 cwt. were shipped from Ceylon in 1890. Twenty years previously the culminating export of over one million of cwt. was reached and simultaneously the fatal fungus began its deadly work. Much interesting information is given regarding cacao, and Dr. Trimen complains of the absence of visible results from

the large number of seed pods disseminated by his department for the use of the natives. Sanguine expectations are entertained of the success of the Pará rubber tree, if grown by the Forest Department on a large scale. As a result of Dr. Trimen's visit to Java, we may expect the medicinal pepper known as "cubebs" to be added to our economical products, together with other useful plants. Nutmegs are noticed as likely to be profitably grown in the lowcountry. Our own experiments have proved that they are not happy in the ordinary conditions which suit tea and coconuts. They evidently require deep soil or very careful culture. From the information given, New Zealand flax would seem to be *the* fibre plant to which attention ought to be directed by planters. An experiment by Mr. Nock on a plant grown under favourable conditions showed that an acre of similar plants would yield 54 tons of leaves. Say that 40 tons were the average and that the result in clean fibre was 10 tons, it looks as if this ought to pay? There is a plant of *Phormium tenax* in flower and seed on Abbotsford, just now, and the resemblance to "Indian shot" is striking. The plant grows luxuriantly at high altitudes; and by mere separation of the leaves, good fibre string is obtained. We should like to see an experiment made with the long tough leaves of the "hot poker" (*Tritoma revaria*). The details of the partially successful attempt to grow apples at Hakgala and the most encouraging trials of potatoes are interesting and ought to be useful. The successful growth of "blackberries" (such a favourite fruit in the United States) from English seed is also interesting, and planters ought to have some of these plants in their gardens for dessert and tart fruits. We are glad to see that Dr. Trimen has been adding to the Flora of Ceylon, and that materials are being got ready for the long-promised Botanical Handbook. When it does appear, we trust it may contain or be accompanied by coloured portraits of some of our most characteristic, beautiful and peculiar plants,—such as the doons, kumbuks, balsams and nilus. The Museum is extending, and the Laboratory is occupied by a fresh student from England. The sales of plants and seeds, which have been decreasing, realized R2,280, while the total cost of the establishments has been R41,535. The money is well spent, and the colony is repaid by the presence and advice of so eminent a scientific expert as the Director; while the Gardens, besides affording means of humanizing recreation to the local inhabitants, add largely to the attractions of scenery and of tropical and subtropical vegetation which the island offers to visitors from Europe, America, Australia, India and other countries.

Rakwana Gemming Operations—Sale of Gems.—Jan. 14th:—Mr. Justice Dias has been on a visit to his estates, and will see the new factory for them which has been erected since his last visit and fitted up with machinery with the best and latest improvement. Mr. Baddeley proceeded to Colombo a few days ago with a quantity of gems. Fine sapphires are still found on Rangwallatenne estate. Mr. F. L. Shand also went to Colombo with Mr. Baddeley. The natives are pushing on with gemming, but are not doing much. The plumbago pit on Barra estate is being worked vigorously, and a large quantity of plumbago was despatched to Colombo on the 10th inst. Illicit gemming is still going on on Handopanu and the Crown lands. Mr. John Brown of the Commercial Company paid a visit the other day to Hatherleigh estate. On Wednesday last there was a sale of gems on Bottiatenne. The stones were not very valuable and there were only three lots. The first lot fetched R235; the second lot R80; and the third lot R60. Most of the gems sold were sapphires.—Local "Times."

The Archæological Surveyor, Madras, during a recent visit to Ramesvaram gained some interesting information on the ceremonies performed by pilgrims while on their journey to and at that shrine. He inspected the sacred bathing place of Dhanishkodi, at present situated at the end of a long strip of sand about 15 miles south-east from Ramesvaram. It is considered sacred as being the meeting place of the waters of the two seas—Mahothathi (north) and Rathnakaram (south). There are no ancient buildings at the present bathing place; and on inquiry he learned that the sea is receding at this point and the land has advanced at the rate of about 5 miles in the last 40 years. A narrow strip of shallow water separates Dhanishkodi from an island about 15 miles long, and when this strip silts up, as it is steadily doing, the pilgrims will have to travel other 15 miles to the meeting of the waters.—*Madras Mail*, Dec. 5th.

Sir Charles Bruce, K. C. M. G., writes in the current number of the *English Illustrated Magazine* on British Guiana—its history, its present condition and its prospects. After briefly referring to the discovery of Guiana by Sir Walter Raleigh and the subsequent visits to the country of other enterprising spirits of the Elizabethan era, Sir Charles proceeds to recount its cessions and retrocessions and conquests, its boundaries, and the physical features of the Colony as it is at the present day. The legislative machinery is also briefly described, together with the people, the fauna, and the religious and educational systems. Sir Charles commends the absence of prejudice against the coloured inhabitants of the Colony, and remarks that the African race is rapidly coming forward in the management of plantations and other commercial enterprise. He thinks that great credit is due to the Dutch for the admirable scientific and technical skill with which they planned and accomplished the settlement of Guiana, and describes the methods of the Hollanders at some length. In the opinion of Sir Charles, the prosperity of British Guiana is the offspring of sugar, and it is only the enterprises and monetary resources of the planters that have saved the Colony from the depression of the sugar industry which has seriously affected the West Indian islands. Among those who have been chiefly instrumental in enabling British Guiana to struggle against the menacing increase in the beet crop, "a prominent place will be universally conceded to Mr. Quinton Hogg, who has spared neither money nor his own intelligent energy in introducing and perfecting the new process by which sugar is extracted from the cane by diffusion." Sir Charles adds that the Government are making persistent and strenuous efforts to develop the vast dormant resources of the Colony, and the low rate at which land can be brought is certainly calculated to encourage the agricultural industry. The discovery of gold gave British Guiana hopes as to its mineral wealth, and mining for the metal is now pursued to some extent, while some regions have but recently been proved diamondiferous. "At a time when much British capital is seeking investment in the sphere of British influence in South Africa, and elsewhere altogether outside the sphere of British influence, it may be admitted to be the duty of all concerned in the administration of the outlying provinces of our own Empire to invite attention to fields for the investment of capital within its limits." The Colony at present is too deficient in labour and capital to take advantage of its unquestionable natural wealth, and a more venal motive, as well as patriotism, should lead British investors to turn their millions into West Indian channels instead of persistently ignoring them for foreign republics.—*Colonies and India*, Feb. 7th.

CEYLON UPCOUNTRY PLANTING REPORT.

P. A. MEETING—LENGTHY REPORT—SUGGESTION—CUBEBS—P. A. SECRETARYSHIP—WEATHER—TEA—DRUNKEN COOLIES AND DRUNKEN PLANTERS—AN INDIAN STAFF-SURGEON ON MALARIA—DRINKING GOOD WATER AS A MEANS OF PRVENTING SUNSTROKE.

Feb. 22nd.

The annual meeting of the Planters' Association is becoming every year more and more dreadful owing to the length of the report. *Forty-five* minutes occupied in reading it, to an audience some of whom were talking, some few listening, many yawning, and all more or less bored*, one would think it is hard enough on the Secretary to compile this voluminous record; but to have to read it after it has been got up, seems cruelty. If it be an essential that the report be read it would be a wise thing, I think, to make it the *last* part of the programme; and then, those who really care to hear the record of the year's doings gabbled over can indulge themselves to their hearts' content. As it is at present, much valuable time is wasted, which might well be spent on other and more important matters. The report is no doubt a very praiseworthy production, and the sweep of the net is so extensive that anything that but touches the planter's interest is lauded, and made a prize of. But when you think of the many legitimate topics which rightly call for attention and comment, and that after all life is short, all zeal ought to be repressed. This may be hard on the Secretary; and if he feels aggrieved at not having his full swing, I for my part would willingly vote that Mr. Philip should have more pay, rather than that we should have more report.

As an evidence of this growing evil of over-reporting and the dangers into which it leads, take this passage under the heading of minor products:—

"Cubebs.—The true plant yielding this valuable berry has still to be introduced into Ceylon, all previous introductions having turned out factitious." Without staying to notice this funny use of the word "factitious." I would ask was there ever a finer specimen of the evil I complain of than what I quote? It matches the historic chapter on the snakes in Iceland. There were no snakes in Iceland; and there are no "cubebs" in Ceylon!

If this sort of thing goes on where are we going to end? for the principle which would allow a paragraph on "cubebs," would in the hands of a willing and voluminous scribe like Mr. Philip allow almost anything. To be sure if the report were simply printed, and one could read it or not just as one liked, it would not matter much; but as things obtain at present, if you attend the annual meeting you must hear the report, and what a tiresome time-destroying thing, that is, we all know.

It is hard to imagine the Planters' Association with any other Secretary than Mr. Philip: but of course a time will come—may it be long distant—when the position will have to be filled by some one else. When the necessity arises to appoint a new Secretary, where will the man be found bold enough to undertake the duties? If these yearly reports go on increasing in volume as they do, the very thought of them would choke off all except the rashest.

It is all very well for a man who likes it, to go on using up stationery by the ream, and filling innumerable pages of foolscap with "copy": but is posterity to be wholly ignored? Lord Brougham felt that Campbell's "Lives of the Chancellors" added a fresh sting to death: but these bloated and overgrown reports are death itself: for the post of Secretary will assuredly become extinct, when the present incumbent takes off his mantle and lays down his pen. It is with a view to prevent such an appalling catastrophe, and before things are beyond all hope, that I draw attention to the danger ahead.

The weather has all of a sudden changed, and without any warning we have been dropped as it were into the hot season. I suppose we may get used to it, but meanwhile, the sun is broiling, and the days are hot.

Tea is simply doing wonders, and there has been little or no complaint of the difficulty of finding work for coolies, as often happens at this season. To get round the flush in time is what bothers.

To see ourselves as others see us, is often a revelation. An appu the other day informed his master that the coolies were all drunk in the lines. "Drunk?" queried the planter. "How do you know they are drunk?" "I know they are drunk, you can hear the noise," was the answer. "But there might be noise without the coolies being drunk," continued the planter. "Sir," replied the appu, "when master gets drunk he keeps quiet, but when a cooly gets drunk he makes a noise, becomes quarrelsome and wants to fight."

I remember in the old days, when Colombo Fort was really a fort, hearing of two upcountry men, returning from a convivial evening being challenged by the sentry. "Who goes there?' shouted the guard, and the reply came back "Just twa drucken planters!"

It would seem, in spite of all temperance teaching, that those old worthies—rather *un*worthies—are not without their representatives today. More is the pity.

A retired Indian Staff-Surgeon was writing last month in the *Lancet* on "Malaria," and giving general advice on the best means for the Anglo-Indian to preserve his health. Now that the hot weather is on us, it may not be out of the way to quote the following:—"Good drinking water plays an important *role* in the preservation of health, for the incessant drain of fluid from the system by perspiration requires a liberal supply of water, and though the result is prickly heat, the benefit to health is ample compensation. A long drink of cool—not iced—water before and after exposure to the sun is an almost certain protection against sunstroke, *provided the water is not diluted with a little spirit.*" I have taken the liberty to italicize where it seems to me that the point comes in.

PEPPERCORN.

* Has our correspondent heard how the Yankee puts it: Speeches (or for that matter Reports) should not exceed (so many) minutes; for if "ile" is not struck in that time, the speaker or Secretary should give up *boring!*—In respect of the ponderous P. A. Report, we certainly think that after it is gone over in Committee, it should do if the *headings* were read at the General Meeting, and then if any member wishes what is said under any one head, read out in detail, this could be done.—ED. *T. A.*

MINES AND MINING IN CEYLON.

We have frequently had our attention called to the unsystematic mode of plumbago mining in Ceylon, and to the necessity for government interference, more particularly with the view of protecting the health and lives of miners, and secondarily with the view to establishing a systematic mode for the working of mines: we shall begin by describing the common modes adopted by the Cinhalese.

A native usually drives a shaft as far as he can, so long as he is able to contend with the flow of water in the mine. He then stops working, and afterwards drives galleries, and this he continues to do as long

as his lamps will burn, but the moment the lamp are extinguished by the gases collected in the gallery he ceases working in that part and continues upwards refilling the shaft he has dug with the *débris* from the mine. In other cases, instead of sinking a shaft a large open cutting is made, in which they follow the vein and afterwards run galleries as occasion may require.

They have no system for ventilating their mines, and the result is that after a blast much time has frequently to be wasted before the mine is sufficiently cleared of foul gases to allow working to be resumed.

Then as regards the timbering of mines. The great object of the native proprietor is to keep his expenses as low as possible. As to the timber he is using he knows nothing of its strength, and is quite unable to work out the strain it will stand. He doubtless knows certain timber will resist damp, and is stronger and tougher than other woods, and when procurable would probably use such woods in preference, but as the wood is generally green and full of sap it necessarily cannot resist the ravages of damp as it would do if it were properly seasoned. The result of all this is that the shafts and galleries are frequently insufficiently timbered.

The windlass used is frequently insufficiently strong, and has no rachet-wheel or pawl, so that serious accidents may occur in raising and lowering miners. The rope used is the ordinary coir rope of the country, the strength of which doubtless varies very much though of the thickness, according to where it has been made and the quality of the fibre used.

Instead of the rope a ladder is frequently used by the miners, and these are made of the roughest materials and frequently tied with jungle rope or ordinary coir yarn. There is no regulated distance between the rungs of the ladder, as at home, there the ladders are fixed at some convenient angle with substantial platforms of not more than twenty yards apart. In Ceylon there is a perpendicular ladder to the bottom of the pit, and when it is remembered how highly lubricated the wood must get from the hands and feet of the natives who have been working plumbago, the great danger they run every time they mount and descend can be well conceived.

There is no inspection of the mines, and last year a very serious accident occurred in one of the Rakwana gem pits, leading to death by drowning.

The Government has enacted an ordinance by which they reserve to themselves the right of control over the safety of the miners, but as yet we have heard of no steps being taken to formulate rules and regulations for the management of the mines such as are in use in England.

Of course it is not sufficient for the Government to make rules and regulations without seeing they are carried out, and for this it would be necessary to appoint an inspector of mines whose orders the native headmen should see carried out. A very necessary regulation is an up-cast and down-cast shaft, or in the case of small mines at least of an adit, otherwise in case of an accident in the main shaft the miners may all be buried.

As an example of the want of feeling amongst the natives, we instance the case of a man who was buried in a gallery through the falling of a large mass of earth. His companions, taking for granted he would be dead, were simply going to leave him there, but fortunately for him, a family connection of his insisted on his being dug out—alive.

Probably the Government might fear, when first introducing any new laws and regulations, they might seriously affect the plumbago industry, and consequently the revenue obtained therefrom. This perhaps, might be sufficient to cause delay in introducing them.

The fear that may be entertained as regards any interference with the trade and revenue in plumbago can only be very short-lived, as the new regulations will only weed out of those proprietary miners who have small capital and are unable to do justice to the men they employ; but it will have the good effect of inducing a systematic class of mining which can only bear good fruit. For, from what we have always heard, that the further down the mines are carried, the larger the plumbago veins and better the quality, so that were our mines worked to anything like the depth of some English mines, we feel convinced that the plumbago would not only be found in larger quantities, but the quality would be better.

We learn from a geological friend that it is his opinion that our metamorphic rocks when they were in a sedimentary form previous to the igneous action which crystalized them, carried a large amount of coal or carboniferous matter, perhaps in the form of lignite, and that the igneous action which crystalized these rocks which must have been under great pressure, converted the carboniferous matter into graphite, and to the same igneous action must be attributed the upheaval of our rocks, and to this must also be attributed the more or less vertical position of many of our graphite veins.

Should our friend be right in his surmises, it will be easy to conceive what large deposits of graphite we may find when mining is conducted more systematically and at greater depths.

There is still another matter we consider deserving attention, and that is the large number of minerals dug out of plumbago mines, and which doubtless have some value, but with which the natives have no acquaintance, and consequently these are sometimes thrown away. We instance amongst other minerals pitchblende, so well known as a valuable ore of uranium and which has been found inside plumbago. The *Daily Telegraph* last year had an article on the subject of uranium, and amongst other matters noted the market price is quoted at about £2,400 a ton.

Then there is the mineral pyrrhotite, which is found largely in plumbago mines, and from which in other countries the greater part of the nickel of commerce is extracted. However, we are unable to state with certainty if the pyrrhotite discovered in Ceylon is nickeliferous, but think in all probability it will be found so. Steatite is, we believe, a common product of plumbago mines. Magnetite, showing strong polarity, is also common in many parts of the island. Chalcopyrite, a mineral that has been found in various parts of the island is one that doubtless can be worked to advantage. These minerals containing such rare elements are columbian yttrium and zirconium, are found in our alluvial deposits, and would probably be found in the matrix were there sufficient demand for them. Mica sometimes in large plates is abundant. Gold has been found in numberless places and in large nuggets in the neighbourhood of Morawaka. Manganese is abundant, and of course Ceylon is specially noted as a gem-producing country, but on this subject we intend writing more later on, and, doubtless, there are numberless other minerals which have escaped notice, and we feel sure that the day is not far off when Ceylon will prove itself much richer in useful minerals than it has had credit for.

The fact that so little is known of the mineralogy of Ceylon is in a great measure due to the want of interest taken in it by Government, whose system has been so far with one exceptional case to leave all such matters to private enterprise.

To those who are acquainted with the Government and history of Ceylon it must strike them as very anomalous that so many new laws and regulations should be constantly enacted by Government in reference to the health and well-being of our imported labourers from India (a class who are more specially well looked after by their masters, and who would have the same care devoted to them irrespective of any Government ordinances), when this same Government neglects the health and welfare of a large proportion of the aborigines, whose lives, we think, should be equally valued with those of their brethren of India.

Should death occur in mining through carelessness on the part of the proprietor, the Government inquiry into the death would simply report it as an unavoidable accident, and Government would, of course, be satisfied with such an explanation. It will not do for Government to compare the statistics as to violent deaths in this country with those of coal mining districts. In Ceylon we never hear of explosions of gas, and those who are poisoned by the

carbonic acid which they have been compelled to breathe in the minos will have their deaths attributed to natural causes, and were inquiry made, it might be fonnd that these would be a larger factor than is generally supposed.

In recommending official interference, we do so advisedly, as we feel sure that Government will not make any regulations other than those necessary to keep the mines in a safe and healthy condition, and for a small sum the ventilation necessary can be very simply applied by using a very small air propeller worked by hand, or where two shafts have been sunk, by having a small furnace at the bottom of one of them. In such mines simple contrivances of this kind would be, we feel sure, quite sufficient to meet the approva of a Government Inspector.—*Ceylon Advertiser.*

THE TALGASWELA TEA COMPANY OF CEYLON, LD.

REPORT OF THE MANAGING DIRECTOR.

I visited this estate on May 7th 1890, and submitted to the Directors a confidential report, having previously not made a personal inspection since the land was cleared. In January, 5th and 6th, 1891, I made my second visit and have to report to the shareholders as follows:—

ACREAGE.—The estate consists of 716 acres cultivated, of which 510 acres were planted with tea in May to July 1888, and are now 2½ years old and 206 acres were planted in 1889 and are now 1½ years old. There are large ravines and swamps about the clearings which were planted with tea, but in which it can never be expected to grow, the subsoil being stiff and damp, whilst there is not sufficient fall to admit of efficient drainage. These swamps are now being planted with arecas, and their area will be surveyed, but roughly speaking they are about 35 acres in extent, and reduce the tea clearings to 485 acres, and 196 acres respectively.

SITUATION.—This estate is situated between the Gindura and Bentota rivers, the present outlet is by the former from which the factory is distant about 2 miles. About 15 miles of water carriage brings the produce to Baddegama, which is 6 miles from Hikkaduwa on the Galle road where the Railway will soon be available. An outlet by the Bentota river to Bentota could be made available, this river being five miles distant from the estate.

Rainfall in 1888 was 178·20; in 1889 241·13, falling on 158 days, in 1890 190·93 falling on 153 days. The past year has been a bad one for rainfall at Talgaswela as at many other parts of the country, the S.-W. monsoon months were abnormally dry, and the yield of tea suffered in consequence.

The lay of land is mostly very good for tea, being of a gently undulating character, with a few steep faces only here and there. All the opened land was originally virgin forest.

The Soil is on the whole fairly good, most parts of the estate shewing a really good tea soil, ironstone gravel is very abundant, and experience in the low-country has shewn that this soil is suitable for tea.

Roads and Drains are well cut, and in good order, and all the clearings shew signs of careful work, and have evidently been well opened. I consider that the clearing works reflect credit on the Manager.

The 2½ years old tea is planted in 5 clearings of about 100 acres each, separated by belts of forests No. 1 is a very fine field of tea, a large portion of in is Manipuri indigenous, which is covering the ground well. No. 2 is also a good field. No. 3 is the poorest of the old clearings, as it was chiefly planted at stake, and the jat is inferior to the rest of the estate. It has been pruned low, however, and has improved greatly in appearance during the last six months. No. 4 is a good field. No. 5 is fairly good but there are a few bad patches in it.

The 1½ years old tea is divided into 2 clearings of about 100 acres each, numbered 6 and 7. No. 6 is almost entirely Manipuri indigenous, and is remarkably regular and vigorous. It was planted with transplanters, which have proved a marked success. In No. 7 I regret to say that about 40 acres were again planted at stake, and the original planting was an almost entire failure. About 60 acres of it planted with stumps from an old nursery is most successful. The first supplying during 1890 was very unsuccessful, owing to the partial failure of the S. W. Monsoon. Recent supplyings were more successful, but this work will have to be carefully gone over again this year.

Nurseries are being made in each clearing for 18 maunds seed from Kelvin and Seaforth, and the supplying will all be done with transplanters.

Buildings consist of a well built manager's bungalow, an assistant's bungalow, and various lines, built of cheap materials but sufficient for present purposes as the labour is not resident on the estate.

The Factory is a well built permanent building of brick and timber with an iron roof, 60 ft. long and 40 ft. wide with two withering lofts above the ground floor, one end is temporarily boarded up so that the building can be extended if desired. The machinery at present consists of an "economic" roller, and a double desiccator, but a "rapid" roller, tea sifter and a roll breaker will have to be erected at once. The total cost of this building, dam &c. has been R16,017·66. The work has been well done, but I do not consider that economy has been studied as it should have been, nor was it necessary to erect tats last year for about 6,000 lb. leaf when only a few hundred pounds daily were expected. No proper estimates were made in advance for the various works connected with the factory, and higher expenditure than was ever anticipated has been the result.

WATER SUPPLY.—This has proved most disappointing. The streams in field 3 which we were led to expect could not have been diverted into the lake, and which were relied on by the engineer, Mr. Lamont, in his report of October 1888, cannot be rendered available without flooding a large acreage of valuable tea, and prohibitive cost; and the attempt to divert them into the lake has been a failure and has been finally abandoned. During October the head of water in the lake fell from the normal amount, 5 ft. 3 in., to 9 inches, with the result that the area of the lake was reduced by ⅓rd through sloping of the banks, and the Superintendent was unable to roll the 300 to 400 lb. of leaf that was then coming in as thoroughly as he would have wished, the available power being insufficient for the "economic" roller alone. This was due to an abnormally dry season, the rainfall to October 21st being 100 inches less in 1890 than in 1889, but such circumstances may occur again, and it would not be wise to trust to the chance of a wet season to carry us through the new year. I am therefore of opinion that the immediate erection of an engine is necessary, to supplement the water power. The cost of the repairs to dam, sluice, water wheel &c. amount to 2,478, and to this has to be added about R500 for belts, shafting &c. to connect the water wheel with the main driving shaft, or say R3,000 in all. I do not consider that the water power rendered available is in any way proportionate to the money spent, and am of opinion that it would have been more advisable to have erected an engine at once.

The Present site of the FACTORY is a most inconvenient one for the working of the estate. It is outside the tea fields, and transport of green leaf to it, is expensive. The chief fuel supply is also at a distance from it. A most convenient central situation for the factory could have been chosen near the outlet towards Bentota, giving a shorter transport to the Railway, convenient for the transport of green leaf to the factory, and close to the largest fuel reserves. In view of the considerable expense of rendering the water available, and its small and unreliable power now that it is available, I am strongly of opinion that a mistake was made in choosing the present site at all. On the date of my visit the head of water in the lake was 2 feet 6 inches, and the amount flowing in only supplied the loss by evaporation during the day. In the opinion of the Manager this water will last for 10 days, with 500 lb. leaf per day to manufacture, and unless rain fills up the lake mean-

while, hand power will have to be resorted so. It is for such an nnreliable source of power as this that R3,000 has been expended, and the factory beeu placed in a most unsuitable position and one entailing large extra expense in leaf transport, whilst the manager's bungalow being built near the factory, is in a most inconvenient position for the working of tho estate.

At present thero is no alternative but to erect the engine and continue working in the existing factory, but I am of opinion that at a future dato, when the estate is giving a large return and the money can be rendered available, it will be found necessary to erect a large central factory near the Bentota river outlet to which the engine will be moved, the present wheel and factory being kept as a reserve in oaso of breakdown of machinery.

EXPENDITURE during 1890 has been very low and has shown that expectations formed as to cheapness of labour were well founded. The check roll averages for the month vary from 20 cents to 17 cents p r cooly. Plucking including a most expensive transport of leaf and baskets, is cents 2·42 per lb. green leaf for the year; "weeding" has been R4·20 per acre for the year. Theso figures I think speak for themselves and show that there is every justification for believing that in cheapness of production Talgaswela estate will be unrivalled when in full bearing. The amount of leaf plucked has been 76,944 lb. of which 8,879 lb. were sold to a neighbouring estate, and the balance resulted in 16,977 lb. made tea.

ESTIMATES for the new year have been framed and show an expenditure of R38,339·63. To this has to be added the cost of a "rapid" roller, a sifter and roll breaker, shafting, and a 14 horse power engine, which will probably not fall short of R10,000.

The yield I estimate at 90,000 lb. made tea, whilst there is every indication of a very heavy yield in 1892, before which the bushes cannot reasonable be expected to bear much.

Arecanuts have been planted through many of the ravines, and this work is being continued.

Labour has been abundant.

Hoalth of labourers has been very bad during the year, fever having been vory prevalent.

MINING Operations have been carried on by Mr. W. M. Young who has found indications of plumbago. The company have received as arranged 1/10th of the amount of the minerals obtained. The factory has been painted with materials found on the ostate, and the paint seems very good and durable.

The general appearance of the estate is most satisfactory; the bushes are vigorous and shew signs of heavy flushes shortly. The plucking has been most carefully done, showing that Sinhalese village labour, with careful supervision, can be made to do most satisfactory work. I consider that the opening work, and the treatment of the bushes up to date shew signs of hard consciencious work, and I think the estate generally is a credit to Mr. Broadhurst, the Manager, and those under him, and to him I think the shareholders owe a debt of gratitude for good work done nnder circumstances of great discouragement.

T. C. OWEN, Managing Director and Chairman.

Colombo, Jan. 6th, 1891.

Balance Sheet made up for tho year ending 31st December 1890.

Dr. CAPITAL AND LIABILITIES.	R	c.	R	c.
I.—To Capital:—				
2,000 Shares at R100 fully paid			200,000	00
II.—To Debts due by the Company:—				
Baker & Hall for advances	2,087	71		
Rice per Superintendent's report	295	10		
Auditor's foe ...	100	00		
			2,482	81
			R202,482	81

Cr. PROPERTY AND ASSETS.				
II.—By Property Immovable:—				
Land: Cost of Land and Cultivation to 31st Dec. '89	R157,771	59		
" Cost of Cultivation this yr.	13,052	23		
Add Usage of Estate Tools &c.	412	49		
	R171,236	31		
Buildings: Cost to Dec. 31, '89	12,598	81		
Further expended this year	3,374	92		
	R15,973	73		
			187,210	04
By Property Movable:—Machinery	4,128	95		
Furniture	1,486	68		
Stock: Tools, Carts, Boats, &c.	2 284	06		
Less Usage of Tools, &c.	412	49		
	R1871	57		
			7,487	23
IV.—By Debts due to tho Company:—				
Lessee of Riseland Estate for tea leaf sold			684	80
V.—By Cash:—Balance for Supt.'s report			1,325	17
VI.—By Profit and Loss Account:—Balance			5,775	57
			R202,482	81

Profit and Loss Account made up for the year ending 31st December 1890.

Dr. Dec. 31st, 1889.			R	c.
To Balance brought forward ...			5,800	76
Dec. 31st, 1890.				
To Proportion of cost of Cultivation of Estate on that portion yielding leaf ...			5,500	00
To Office Expenses ...			881	43
To Auditor's fee ...			100	00
			R12,282	19

Cr. Doc. 31st, 1890.			R	c.
By Sale of 13,137 lb. made Tea	R5,542·47			
By Sale of Tea leaf	709·91			
			6,252	38
By Timber sold ...			41	00
By Profit on Rice ...			186	72
By Transfer fees ...			13	50
By Interest from Bank ...			13	20
By Balance ...			5,775	57
			R12,282	19

(Signed) JOHN GUTHRIE, Auditor; BAKER & HALL, Agents and Secretaries; THEO. C. OWEN, Chairman; G. CHAPMAN WALKER, G. W. SUHREN, F. C. LOOS, T. WATSON HALL, WALTER AGAR and SHELTON AGAR, Directors.

Colombo, January 1891.

COTTON-PICKING by machinery is one of the recent innovations that have come to stay. A bale of cotton is on exhibition at Memphis, Tenn, which was picked by machinery. The bail weighs 475 pounds and was picked in two hours during a rainstorm—equal to the work of fifteen men. The cotton is much cleaner than when gathered in the old way, and will bring nearly half a cent a pound more. —*Planters' Monthly.*

GRAIN DIAMONDS, or rough brilliants, have been discovered in specimens of rock sands forwarded to M. Charles Velain, of Paris, by M. Charles Rabot, from Russian Lapland. The diamond-bearing sand was taken from the valley of Pasvig, and is the *débris* of granite. M. Velain, in a memoir to the Académie des Sciences, states that the gems, which are vory tiny, may have come from the demolition of pegmatite in the district. This is the first time that diamonds have been found in European soil. —*Globe*, Feb. 6th.

THE GIGANTIC EARTHWORMS OF CEYLON.—The *Quarterly Journal of Microscopical Science* for January contains a paper on *Megascolex cæruleus*, Templeton, from Ceylon; together with a theory of the course of the blood in earthworms, by Dr. A. G. Bourne (plates vi. to ix.) During a short visit in 1889 to Ceylon the author obtained thirty-eight species of earthworms; only seven of these have been found in India, and about twenty-nine Indian species have not yet been found in Ceylon. The author summarizes his theory of the circulation as follows: tho vascu'ar system consists of a portion in the cephalized region, and of other portions metamerically repeated in all succeeding segments. The cephalized portion differs only from that occurring in any other segment in having undergone a synthosis, and also in the presence of contractile hearts. Throughout the body, blood is forced from the contractile vessels into the peripheral networks; thence it is conveyed by a system of intestino-tegumentary vessels to intestinal capillaries, and from these it returns to the contractile vessels.—*Nature*,

THE PUBLIC AND PRIVATE SELLING OF TEA.

We had brought to our notice a short time back the opinion held by Mr. J. Roberts of Messrs. S Rucker & Co. as to the probable effects of the system under which a not inconsiderable proportion of the produce of our tea estates is sold. We are not personally concerned as to whether that opinion can be justified to the extent which Mr. Roberts evidently thinks that it can be; but the views entertained by so good an authority should certainly receive every consideration. But we were not prepared to learn as we have lately done, to how great an extent the system of selling tea through the agency of private friends at home has spread. We have only recently been told—upon good authority—that the produce of one tea estate in Ceylon, which yields annually some 55,000 lb. of made tea, had been sold through such an agency to the large figure of 45,000 lb., and that confident hopes were entertained by its proprietors that the balance which has hitherto had to be parted with in the open market will, during the present year, find customers through the same private channels.

Our informant in this matter tells us that for the quantity thus disposed of privately, the proprietor of this particular estate, netted for the entire quantity fully threepence per pound more than he would have done had he sent his crop to market through the ordinary channels. If we may accept this statement as being fully reliable, there can be no doubt that the system of distribution adopted must present very enticing advantages and, despite the threat held out by Mr. Roberts that in such cases of its adoption as may become known brokers in Mincing Lane would practically boycott the teas of their offending proprietors, there can be little reason to think these threats can be productive of much effect. Every one of our planters would, if they cou'd, resort to any justifiable means for obtaining the highest returns possible for his teas. But we should be inclined to think that the circle of those who could achieve the success above recorded, must be a very narrow one indeed. As was remarked in London to our correspondent, very many of our estate proprietors are bound by the conditions under which they have obtained financial help, to ship all the tea they can grow to the parties who have so assisted them. This restriction must certainly prevent a very large number of Ceylon tea planters from even attempting to enter on the course of parting with their teas through any private or friendly agency.

Of course we can realize that, as has been pointed out by Mr. Roberts, the brokers in Mincing Lane, the men who make their livelihood by public dealing in tea, must regard with strong disfavour a system which operates to diminish the bulk with which they have to deal. If the fact be as stated that an additional profit can be secured to the grower of threepence (or even twopence) per pound on all teas so privately disposed of, we may be sure that to that extent the brokers and other middlemen will be deprived of profit. It must be natural that the trade in London should not complacently view what it will doubtless consider to be an encroachment upon their just rights. Free trade in the abstract has a host of supporters; but when the application of its principle injuriously affects personal p ckets, these principles are in such cases not quite so thoroughly appreciated. It would be no surprise, therefore, to us to learn that every legitimate means would be used to prevent their application in this particular case of the private distribution of tea. While admitting that they cannot help the exercise of private right to dispose of crops to the best advantage of the grower, the brokers, we can well understand, might in self-defence say:—"Well if you *will* go behind our backs and employ what is practically an unpaid agency, to the exclusion of ourselves from sharing in your profits, when you *are* forced to come to us we will soon shew you that we will have *all* your favours or none at all. We will not consent to be made a simple convenience of."

So far as we are personally aware there has not as yet occurred a single case of this nature. We have not heard of the product of any Ceylon tea estate having been thus "boycotted" in the Mincing Lane Sale Rooms. Nevertheless it would not be surprising if such instances did eventually come under observation, and those who are practising this system of being their own distributers will have to reckon how far the advantage gained might be counterbalanced by a practical exclusion of their teas from public competition. For, it is possible, that when teas are sold privately in the way pointed out with an established price, any attempt at advantage through a sudden rise in the public price of tea might have to be sacrificed.

THE YATADERIA TEA CO. OF CEYLON LTD.

To the Editor of the "Ceylon Observer."

Colombo, Feb. 26th.

Dear Sir,—I send you herewith report proceedings at the Annual Meeting of the shareholders of this Company held yesterday together with the Report of the Directors.—I am, dear sir, yours faithfully, B. G. L. BREMNER, Secretary.

General Meeting.

The third annual general meeting of the Yataderia Tea Company of Ceylon, Limited, was held at the Offices of the Company, 13, Queen Street, Fort, Colombo on February 25th, pursuant to notice.

Mr. H. V. Masefield in the chair and the following shareholders were present:—Messrs D. Fairweather, John H. Starey (Managing Director), J. R. Fairweather, E. S. Anderson, G. W. Carlyon, and B. G. L. Bremner (Secretary), and by Attorney Mr. W. Church.

The Secretary read the notice convening the meeting.

The minutes of the last annual general meeting were duly confirmed.

The report of the directors having been taken as read Mr. H. V. Masefield moved its adoption. The Managing Director in seconding the motion offered the following remarks upon the accounts and business. He had to point out a slight misprint in parenthesis in the profit and loss account: the amount written off for depreciation should be R11,051 instead of R10,826. The actual profit for the year was R34,602·18 being rather over 18 per cent, but in no case would the amount written off for depreciation have been available for dividend in view of the resolution of the two previous general meetings to keep capital account down to R350 per cultivated acre. The cost on Board might be considered satisfactory. The item for interest was not likely to recur. The question of paying an interim dividend last October had been carefully considered by the Board, but as exchange was rising and tea was weak on the market, and as the money must have been borrowed it was decided to defer such a division. The cost of the Factory had been R19,434, which seems large, but it was constructed under exceptional difficulties and is a thoroughly satisfactory building. In expectation of large crops it had been deemed expedient to build another withor-

ing house and to supplement the machinery with an engine and boiler and another Dryer. Part of this machinery was already on the estate and being erected, R5,000 part cost being included in last year's accounts.

A new withering shed in course of erection was estimated to cost about R10,000. Only 6 acres had been added to the cultivation last year but 40 acres are to be cleared and planted this season. We had purchased about 53 acres at the land sale yesterday, certain lots applied for having been withdrawn. 14 new shareholders had joined the Company. No shares had changed hands below R100 (par) and recent sales had been at R150 per share. The value of the shares which had risen to 50 per cent premium before any dividend had been paid proved the wisdom of the policy hitherto followed by keeping down the capital account, for the shareholders had gained in improved value more than could possibly have been paid as dividend while maintaining a strong position in the balance sheet instead of a weak one.

Certain questions having been replied to, the report was then adopted.

Mr. ERIC S. ANDERSON proposed that a dividend of R12 per share for the year ended 31st December 1890, being at the rate of 12 per cent per annum be declared and made payable on 28th February. This was seconded by Mr. J. R. FAIRWEATHER and carried.

Mr. D. FAIRWEATHER moved and Mr. E. S. ANDERSON seconded the re-election of Mr. J. H. Starey as Director which was carried.

Mr. E. S. ANDERSON proposed and Mr. G. W. CARLYON seconded:—"That the amount allotted for Directors' remuneration, Secretary's salary and office rent be increased from R1,600 to R2,500 subject to revision should dividend fall below 10 per cent."

The Managing Director having explained how the office work and business of the Company and the calls upon the Directors' time had greatly increased; in some particulars to treble the former volume, the motion was carried.

Mr. G. W. CARLYON proposed and Mr. C. M. GWATKIN seconded:—"That Mr. John Guthrie be re-elected Auditor at a fee of R100 per annum."

Mr. CARLYON proposed and Mr. E. S. ANDERSON seconded a cordial vote of thanks to the Directors and office-bearers which was acknowledged by the Chairman who added that while the vote was very gratifying it was particularly deserved by Mr. Fairweather, the Superintendent of estates.

"The Directors have the pleasure to submit the Balance Sheet and Profit and Loss Account for the year ending 31st December 1890, duly audited.

"The balance at credit of Profit and Loss Account at 31st December 1889, having been written off to immovable property, as resolved, there is no balance brought forward. The net profit for 1890, after writing off for depreciation, as shown by the accounts, is R24,551·18, and the Directors propose that a dividend of 12 per cent, absorbing R22,800 be declared and made payable on the 28th of February and that the remainder of R1,751·18 be carried forward.

"It will be seen that the property representing capital stands in the balance sheet at approximately R350 per acre cultivated in terms of the policy resolved upon in general meeting; cost of a steam engine and boiler and rapid roller not ready for use is included. An additional withering house is being built, and another drier is in order, to meet the requirements of the increasing crops; while the superintendent's permanent bungalow has yet to be built. Hence it will be understood that in 1891, as hitherto, all the earnings of the company will not be available for dividend, though they accrue to the proprietors in the value of their shares.

"The total tea crop was 246,653 lb. or 54,653 lb. more than estimated in last report. The plucking area was 480 acres, of which 100 acres were plucked only for 8 months. The yield is shown below.

"The total quantity of tea for disposal was 248,887 lb. which included 2,234 lb. tea made from purchased leaf, 98,211 lb. were shipped to London, and 150,676 lb sold locally. The cost of tea, including all charges, depreciation, and interest, was 30·9 cents per pound. The net value realised from sales was 40·7 cents per pound, the market having ruled lower than in the previous year; while the large yield was necessarily not of the highest quality and value.

"The Company's property consisted at 31st of December 1890, of 529 acres of Tea, viz:—

Acres				per acre. lb.
172	Tea planted in	1885	yield in 1890	723
208	do	'87	do do	483
100	do	'88	do do	217
43	do	'89	(not in bearing)	
6	do	'90	do	
354	acres Forest			
883	acres total.			

"In consequence of disappointment at the land sales, only 6 acres were planted in 1890; about 40 acres are being opened this year. Certain small additions applied for are advertized for Government sale on the 24th instant.

"The estimated crop for 1891 is 300,000 lb.

"Mr. J. H. Starey retires from the Board by rotation, in terms of the articles of Association, but being eligible, offers himself for re-election.

"The shareholders will be asked to elect an auditor for the current year.—By order of the Directors,

"B. G. L. BREMNER, Secretary."

Colombo, 14th Feb.

Balance Sheet at 31st December, 1890.

Dr. LIABILITIES.		R.
I.—To Capital—		
1,900 Shares of R100 each, fully paid...		190,000 00
II.—To Debts of the Company—		
Sundry Creditor Balances ...	R2,452 18	
Due to Superintendent per Estate Report, December ...	R8,944 28	
Due to Auditor	R 52 50	
		11,448 96
VII.—To Profit and Loss Account— Balance as per Account		24,551 18
		R226,000 14

Cr. ASSETS.				R. c.
III—By Property (Immovable)—held by the Company—				
(a)—Land as per last Report ...	R161,259 69			
Add Land purchased ...	575 17			
		R161,834 86		
Deduct Profit to 31st December, 1889, transferred ...		8,981 09		
			R152,853 77	
New Tea Clearing 1890, (6 acres) ...			891 14	
Buildings—				
As per last Report ...	R 15,207 50			
Add Balance of New Factory Cost ...	7,120 75			
		R22,328 25		
Less written off (say one-fifth cost) ...		4,973 00		
			R17,355 25	
				11,100 16
(b)—By Property (Movable) held by the Company—				
Machinery as per last Report ..	R 15,507 20			
Add New Machinery ...	2,677 78			
		R 18,184 98		
Less written off (say one-third cost) R6,078 and sold R400...		6,478 00		
			R11,706 98	
New Machinery (not erected)			5,000 45	
				16,707 43
IV—By Debts to the Company—considered good—				
Coast Advances			R7,232 67	
Estimated Value of Tea not sold (since realized)			23,202 27	
				30,434 94
By Expenditure on Account Crop 1891— ...				1,995 51
V By Cash at Bankers—				5,762 10
				R226,000 14

Profit and Loss Account for the year ending 31st December 1890.

Dr.	R	c.
To Profits to 31st December 1889, tranferred to Cost of Land as per Balance Sheet	8,981	09
To Cost of Growing, Making, Transport, &c., Tea Crop, 1890 (including R11,051 depreciation)	73,024	28
To Directors' Fees, Secretary's Salary, and Office Rent ...	1,600	00
To Interest ...	2,018	16
To Auditor's Fee ...	52	50
To Statiouery, Postages, aud Sundries ...	81	87
To Balauce	24,551	18
	R101,327	99
Cr.	R	c
By Balance of Account at 31st December 1889	8,489	93
By Value of Tea on account 1889 realised in excess of the sum estimated ...	491	16
	R8981	09
By Transfer Fees ...	60	00
By Net Sale Proceeds of 248,887 lb. Tea (including value of Tea not sold in December as per Balance Sheet) ...	101,267	99
	R101,327	9

TEA AND COFFEE IN NUWARA ELIYA DURING THE "FORTIES."

With reference to the tea planted at Nuwara Eliya under the care of the Rev. Mr. Gepp (uncle of Mr. Gepp, Colombo), when living in Sir Anthony Oliphant's family in the early "forties," it is interesting to know that some of the seed or plants of the same or a subsequent supply were given to the late Mr. Cornell who put them in on his Essex property. Mr. A. J. Kellow writes:—"I have now got the local history of the tea plants I lately referred to. Mrs. Bullock tells me that Mr. Cornell planted a few at Essex Cottage (now Naseby) in 1847 and they grew to be very large trees. They were put in where the old bungalow stood and were the same that I wrote to the *Observer* about in 1873. Were you aware that the late Capt. Fisher tried coffee in Nuwara Eliya? The patch is still to be seen, but I do not know if any of the coffee trees are in existence. Mr. Nock and I purpose going up some day to see."

TEA IN THE UNITED STATES seems at length to have taken a start upwards. From a value of $14,179,000 in 11 months of 1886, there was a fall to $10,658,000 in 11 months of 1889. For the 11 months of 1890 there was a rise to $13,400,000. The imports of coffee have gone up from a value of $39,922,000 in 11 months of 1886, to the enormous figure of $78,266,000 in the 11 months of 1890, or 6-fold the value of tea.

THE RABBIT PEST IN AMERICA.—It is not only in Australia that rabbits have increased so as to be formidable enemies of farmers. A paragraph quoted in the *Indian Agriculturist* runs thus:—

In many localities in the Western States of America rabbits have become a serious pest. For a time the price paid for them had induced hunters to kill many of them but notwithstanding this they have increased and the larger numbers offered the city dealers have brought prices to the point that will prevent an increase in the number killed. In some places it required four rabbits to bring 5 cents last winter, and the hunters quit in disgust. It is probable that before long several States will find it necessary to take measures for the destruction of rabbits.

SETTLEMENT AND EXTENSION OF NATIVE CULTIVATION IN CEYLON: BIG TANKS A NECESST Y.

We direct attention to the following mature opinions on the best means of promoting new settlements and the extension of native cultivation They are from a resident as competent as any man in the country—and far more so than speakers and writers who have never spent a month continuously in a purely native district—to advise authoritatively on the subject. What is said about big tanks deserves careful consideration, more particularly when we remember that it took twenty years to demonstrate the full success of the Batticaloa tank works begun by Sir Henry Ward and Mr. J. W. W, Birch.—We quote as follows:—

"I have thought the matter well over; and my conclusion is that (with exceptions here and there) we are settling up the island quite fast enough, and that the only impetus required is to give the land (waste) on very easy terms, whether to the poor man or the capitalist, if he will accept it in unsettled parts, where at present there is no demand. I do not believe in dealing out money to make settlements, though I would give it to a 'Zemindar' as they would call a large landlord in India—especially a European, if he would undertake to clear and settle a number of families in any place. Of course they would first come as coolies, and the most industrious would in time become tenants. But disappointment would come I think if money was given direct into the settler's own hands.

"Of course where paddy cultivation is to be encouraged—and it is and will long be *the* branch of agriculture the natives best take to—irrigation must be provided, and must keep pace with the cultivation *which it has not done in the past*, coconuts, cotton, &c. follow.

"Wherever the population in the island is dense, there is always not far off a 'hinterland' into which it has been for years spreading, extending and occupying. Open this up with good roads and you will help and attract settlers.

"Matara is now flowing over into the Giruwa Pattu; and before many years the country under the Walawe works will be occupied. Civilization it is said spreads from centres, and we must work for the extension of the cultivated area on the same principle in Ceylon. But you must have a bold policy, not hesitating to launch out because there is a doubt if 'it will pay,' and not frittering the revenue over village tanks, which are a snare and a delusion as a rule, and *pro rata* much more expensive than the big works, as was shown in your columns some years ago.

"I see a great deal of nonsense has been recently talked and written about Kalawewa having failed. Of course it will not fill when the monsoon fails, but in the first place such failure is *not the rule*. Next my experience shows, if the rain does not come at one time, it does at another part of the year, as it has done this year. and having a big reservoir ready, we are able to *bottle* up a lot and keep it until required, and once you get one of these big tanks full, it is wonderful how it can be eked out. Suppose, as is frequently the case, the rains are short or late, there is little or no cultivation, and much of what did come at length would be allowed to run off. But with a big tank, it is *all saved*, and with this behind them, cultivators go on merrily. The tanks and works in Batticaloa and Matara were decried just as Kalawewa is now; but they have lived it down and so will Kalawowa."

SHARPE'S PATENT AUTOMATIC TEA DRYING MACHINE.

This is "another Richmond," and the inventor, who is at present amongst us, only asks a fair field and no favour. Mr. Sharpe leaves for the tea districts of India very shortly: meanwhile, he has given Ceylon the first opportunity of seeing what his automatic drier can do.

He has engagements to erect other and larger machines in Assam, and elsewhere, and is full of hope that the merits of his machine will in time win for it a good place in the race. While fully satisfied that the drier is second to none, he does not claim for it that it is yet a perfect machine, but he hopes, that after some little time in use, he will learn wherein it may be improved, and is anxious for practical hints. There is one thing however on which he takes his stand and that is that his drier will be made to turn out the quantity of tea it professes to do—a one maund machine will deliver 80 lb. an hour, and not 60 or 70 lb. If this is done it will be a boon, for how seldom do we find manufacturers' estimates to agree with those of practical men. A description of this new drier cannot be better given than in the words of the inventor. He says:—

The machine consists of a cylindrical casing, in the interior of which a number of horizontal perforated trays, fixed on a vertical spindle, are caused to revolve by a suitable system of pulleys, belts and geared wheels. The trays are divided into a number of sectors or flaps, each of which is hinged on the frame of the tray on one of its radial edges, the other edge remaining loose, whilst the sectors are maintained in a horizontal position by flat circular supporting rings of somewhat smaller diameter than, and suitably arranged within, the casing. At a certain point a portion of each of these flat rings is cut away, so that the loose edge of each of the sectors or flaps on reaching that point falls, and the leaf on the sector is deposited on the tray below. The leaf, spread wet on the uppermost tray through an opening in the top of the case, is carried round through one revolution of each tray and then dropped on to the tray below until the bottom tray is reached, the leaf being evenly distributed over the surface of the trays by means of adjustable regulators. The fully dried tea falls from the bottom tray into a spout or shoot which conveys it into a proper receptacle placed to receive it. The fine tea or "dholgoorie" falls to the bottom of the machine, where it is received by a non-perforated revolving tray which delivers it automatically into a separate receptacle.

The heated air from the furnace is drawn up through the perforated trays and the superincumbent tea leaf, and is driven out of the casing by means of powerful exhaust fans fixed on the top of the machine, but no light leaf is carried away with the current of air, as is so often the case when exhaust fans are used.

By means of a pair of cone pulleys the speed of revolution of the trays may be varied within all practical limits, so that the duration of exposure of the leaf to the heated air may be regulated with great nicety.

A number of openings are made in the casing, each provided with a close-fitting door, so that the process of drying may be examined at any stage. These openings also give easy access to the interior of the machine for repairs. The lubrication of the bearings is so arranged that no oil or grease reaches the interior of the machine.

The furnace consists of a fire-grate of large area enclosed in a fire-brick flue, from which the heat is conveyed by suitable ports to a brick chamber, in which are arranged a number of cast iron tubes held in position by cast iron tube plates at either end. Baffle plates are so fixed as to ensure thorough circulation of the heat amongst the tubes. A wrought iron chimney, fitted with a damper, secures the necessary draught and carries away the smoke. Openings with doors are provided for cleaning the tubes and flues, and of examining the interior of the furnace.

The machine is attached to the tube plate at one end of the air-heating tubes, the opposite ends being open. The air is drawn through the tubes by the before mentioned exhaust fans, becoming heated on its passage. Special means are provided for making a perfect joint between the tubes and tube plates, so that there is no risk of deleterious fumes or gases from the furnace gaining access to the interior of the drier.

A thermometer is fixed to the machine, by attention to which the furnace attendant may easily maintain an uniform temperature. Should the heat, however, become excessive, it may instantly be reduced by admission of cold air through valves provided for the purpose.

On Wednesday, Mr. F. D. Philips of Hangranoya on whose estate this tea drier has been put up, had a public trial, which was seen by a number of planters from different districts. The inventor was somewhat at a disadvantage, as there had been much delay in getting a pulley, and it was only the day before the public exhibition that the machine could be run at all. The tea was fired at a very much higher temperature than we are accustomed to, but at the first trial the maund was not managed by the hour. The tea seemed to run a considerable risk of over-firing. During the second trial, a change was made in the cone pulleys, which brought the tea out very much quicker, but it was hardly fired enough. The quantity however was very much increased, and it was clear that an intermediate pulley would effect all that was wanted both as to quantity and condition. If Mr. Sharpe had had more time, this would have been seen to before the public were invited to criticise.

The feeding too was wanting alteration: it was too primitive; but this is to be attended to, in fact an automatic feeder will be supplied. The machine is very strongly built, and it *was* warm. I don't know that I ever was in a tea house with so high a temperature: a wooden casing with asbestos packing will soon put that to right, and save fuel.

By-and-bye this new machine will have a fairer trial than it had on Wednesday, and it is only when it is in good working order that a reliable report of its doings can be given. Meanwhile it is pretty clear that the principle of the machine is a good one, and it is only minor matters which want a little adjusting. Mr. Sharpe was very anxious for practical suggestions, and it seemed to me that he got this. Perhaps he got more, for the planter is sadly wanting in reverence, and when they gather together in a critical spirit there is a good deal of amusing effervescence.

Mr. Phillips hospitably entertained the company at breakfast and tiffin: at the latter meal, success to the drier and the health of the inventor was enthusiastically drunk. Mr. Phillips' health too was also proposed. Altogether the gathering was an enjoyable one.

COTTON SPINNING IN CEYLON.

Bombay millowners will learn with interest of the early experiences of the pioneers of mill enterprize in Ceylon. A year or two since a Company was formed for establishing a spinning and weaving mill at Colombo, the first we believe in the colony. Some of the lessons taught by Bombay experience have been carefully taken to heart by the Ceylon Company. The quarter-anna per pound rate of remuneration for the agents has not been introduced; if it had been, it was pointed out at the meeting of the company last month, the agent would have "walked away with the whole of the profit balance." In some other respects, however they do not manage things better in Colombo than we do in Bombay. As only half of the capital of eight lakhs has been issued the company is in need of money to pay for its machinery and other purposes, and as the shares are at a discount of nineteen per cent the directors think it better to raise money for immediate requirements either by loan or in debenture stock. If, as one of the promoters said at the meeting the other day, the company can make more than enough to cover bank interest it is better for the existing shareholders not to issue the balance of their capital; but in that case the chairman's reference to the company having been crippled for want of money was much too pessimistic. It seems as though the Ceylon mill were no more free than other mills have been from the inconvenience attendant upon having started with too little capital. The company has difficulties probably not insuperable, in other directions. It has not yet solved the problem of cotton supply, and it has had to solve its labour problems in a somewhat expensive way by importing skilled hands from Bombay and Madras. The labour difficulty is one which the directors do not underestimate. The Cingalese labourer, in addition to being as yet untrained, is very irregular in his atten-

dance at work—a fact which would have to be borne in mind if at the instigation of the Holt Halletts of the future a Factory Act were to be imposed upon the as yet undeveloped textile industry of Ceylon. Apart from these difficulties, however, the company is able to give a good account of its operation and prospects. The manager extols the Ceylon climate as perfect for cotton spinning and weaving. It is never too dry, and the excessive moisture of the rainy season is easily overcome by artificial means. He has some of Dobson and Barlow's best plant to work with, and boasts that the quality of his yarn and cloth is superior to that of the products of the Indian mills, and very nearly equal to English. He would be a singular manager if he said anything less than this. However, the experiment will at all events be interesting enough to be worth watching. Cotton spinning in Ceylon must necessarily be carried on under difficulties, and these have not been reduced by starting the enterprise with something less than half the requisite capital. But the company seems hopeful enough, and if hope could assure success this ought to prove a prosperous concern.—*Bombay Gazette.*

EAST AFRICA;—THE BRITISH, PORTUGUESE AND GERMANS—AND THE PLANTING SETTLEMENTS.

We have had an interesting conversation today with Mr. A. Carnegie Ross, British Vice-Consul at Quilimane in Portuguese East Africa. Mr. Ross is married to the second daughter of the late Mr. R. Boyd Tytler and our readers will remember the graphic description of a Christmas experience at Quilimane by Mrs. Ross which we published a short time ago in our *Literary Register*. The connection of Vice-Consul Ross with Ceylon is therefore a close and interesting one and it is no wonder that when the time came for a holiday and the opportunity of a steamer offering, Mr. Ross should take passage in the S. S. "Clan Mackay" for Ceylon; and after spending a thoroughly enjoyable holiday with his relatives, Mr. and Mrs. Vollar and the Messrs. Tytler here, he is now voyaging to London by the B. I. S. S. "Goorkha" which left here this afternoon. With all the stir about East and South African affairs at home just now, Mr. Ross's presence and experience will be very acceptable.

Mr. Carnegie Ross—who is tall, slim and wiry, a keen hard-headed Aberdonian of the intellectual type,—has been in East Africa for six years. He came out as Agent for the African Lakes Company and later on combined this Agency with the British Vice-Consulship at Quilimane, the capital of the Portuguese Settlements. His office there has, as may be imagined, not been a bed of roses for the past year or so; but though he has had very amusing, as well as perhaps annoying experiences, he has managed to maintain not only peace, but even friendship with the leading Portuguese officials, and he is so well-known among them as well as their half-caste and native employees to be a man of his word, that no interference with him officially or personally has ever been attempted. As administrators, colonists or settlers, or even as merchants and traders, the Portuguese are beneath contempt. They have never done, and never will do, anything with their African territory: and they might as well try to mop back the Atlantic as try to prevent the spread of British and German influence. Mr. Ross expects that with the advent of Mr. H. B. Johnston, C.B., as British Commissioner for the territory, the Zambesi will be thrown open for general traffic for all its navigable length and any barrier attempted by the Portuguese will be promptly though peacefully removed. Mr. Ross speaks very highly of Mr. Johnston's capabilities, as also of Mr. Joseph Thomson, another well-known explorer and geologist, now at the head of an expedition to the West of the settled territory, among his staff being Mr. J. A. Grant, a son of Colonel Grant (of Speke and Grant African fame); and also of Mr. Cecil Rhodes and the South African Expedition and settlers. Mr. Ross has often made the trip up the Zambesi 400 miles to the Blantyre Mission and the Shiré Highlands, the headquarters of the East African Lakes Company. This is chiefly a Plantation Company, and its leader Mr. Buchanan (although without any experience as a planter) guided by our Ceylon Planting Manuals and the *Tropical Agriculturist* which he gets regularly, has opened and planted a considerable extent with coffee which is flourishing though there is some talk of "borer" and other troubles. Mr. Ross shipped 200 cwt. of the coffee in the "Clan Mackay" at Quilimane, and seed he has given Mr. Vollar has already been planted in Dumbara to see how it will turn out. Labour is described as very cheap, a few silver coins a month, or a piece of calico ensuring willing labour. The Shiré Highlands up to 3,000 feet altitude, but some 18° from the equator, seem intended for a coffee country from the account given of them. Cinchona has also been tried on a moderate scale. One Indian planter has established himself near Blantyre (marrying a lady of the Mission) and has now a promising coffee garden. Of course, the cost and difficulties of transport are the great drawbacks. Mr. Ross, with his knowledge of the country and people, has made the journey in three weeks; but ordinarily six weeks are required between the Blantyre Settlement and the Coast. The only Ceylon man who has turned up is Mr. Henry Brown (formerly Inspector of Police in Colombo and coffee planter in Matale). He has gone up the Zambesi in a native boat to get to the planting settlement—this being the cheaper though much longer way of going. By the solitary steamer which runs on the Zambesi for 400 miles at intervals, the passage is £20 sterling. Mr. J. R. W. Pigott, formerly of Dikoya and Matale, is in the employment of the Imperial British East African Company, working much farther north. His station is Mombassa and the Company's work is chiefly administrative so far, no planting having been done. Indeed there is enough to do to keep the Arabs (slave dealers) in order in that district, while farther south near the Zambesi, no Arabs have yet found an entrance and the natives are tractable and easily managed if only fairly dealt by. East as well as South Africa is bound to be opened up and the highlands to be colonised at a rapid rate in the next few years. One drawback at present is that the British India Company have ceased to send their steamers farther south than Zanzibar, while the Donald Currie line seldom come to Quilimane. A coasting service for the whole of the East Coast would be an advantage, and there ought to be abundance of traffic both in passengers and goods if connected with the Cape service and with European lines say at Aden.

We wish Mr. Carnegie Ross a pleasant trip home and a profitable stay in the old country, and afterwards a return in due season with Mrs. Ross to his adopted home, with speedy promotion soon to follow in view of the rapid development of East Africa both in plantation and mining settlements. We are sure to hear of Mr. Ross's name in responsible positions as time rolls on. His principle of righteous dealing with the natives has evidently been in contrast with some of the doings of Stanley and his followers, and this has served to make his name well-known and appreciated along the Zambesi and neighbouring territories. It is

quite evident that Lord Salisbury does not mean to give up one inch of the territory recently exploited by the South African Expedition. Five hundred carefully selected men of this Expedition since disbanded, have now taken up allotments chiefly for mining purposes and nothing can ever alter the British character of the grand territorial area so occupied and settled. The exports of gold from this quarter will soon show how rich is the country in auriferous wealth and the usual rush of population from Australia and the mother-country may be expected to follow.

PREPARATION OF CACAO IN CEYLON.

[*From the "Trinidad Agricultural Record" for Jan. 1891.*]

Royal Botanic Gardens, Peradeniya,
24th October 1890.

The Hon'ble the Colonial Secretary, Colombo.

Sir,—In returning to you His Excellency Sir W. Robinson's letters forwarded to me with your letter No. 33 of 20th October, I have the honour to express my pleasure that the information I was able to afford proved so much to the point as regards the inquiry upon which he was engaged. I beg that you will convey my thanks to His Excellency for the copy of his article, and in accordance with his request that I would make a few additional remarks, I beg leave to offer the following observations suggested by its perusal:—

1. Though we have now pretty well settled the point (long in doubt) that the "old red Cacao so long cultivated in Ceylon is that known in the West Indies as Criollo or Caràcas," it should be borne in mind that it is now by no means the case that all the Cacao sent from Ceylon to the London Market is of that variety. Of late years a good deal of Forastero (and that of numerous sorts) has been grown: and the opinion of planters is by no means universally in favour of the Caràcas variety. For in the market the two sorts are often very evenly priced. Thus, lots of the two kinds grown on the same estate and kept carefully separate and sold on the same day in March last in London, fetched respectively per cwt:—Caràcas, average 106/7¾; Forastero, average 107/.

I am not aware on what evidence Mr. Morris's statement that Ceylon is indebted for Criollo Cacao to the Dutch is based. It may be correct, but the earliest record I have met with of the plant in the Colony is 1819, and I believe it to have been then quite recently introduced. This would be some twenty years after the British occupation. But there is no record of whence it was obtained, nor is there any certainty that it was of the Criollo variety, though this is probable. What is certain is that the great bulk of the Caràcas Cacao in Ceylon is descended from a consignment of seedlings obtained in 1834-5 by Governor Sir W. Horton from Trinidad.

The general difference of the two sorts as grown now in Ceylon could not be better described than in the words quoted in Sir W. Robinson's paper (p.p. 3, 4) from the *Agricultura Venezolano.*

3. His Excellency rightly dwells on the importance of careful artificial drying in wet and sunless weather, but there is another point in which Ceylon practice differs from that followed in the West Indies to which he has scarcely alluded. That is the washing of the seeds. None of the mucilage or pulp is ever allowed to dry on the bean; all is carefully washed away by copious and repeated ablutions.* It is this especially that gives the Ceylon product the clean "bright" look that is appreciated in the market. I should, however, remark that the attention of the Trinidad cultivators has been already strongly called to this in an article by Mr. Preston in the *Trinidad Chronicle* so long back as 1883. HENRY TRIMEN.

* The Editor of the *Trinidad Agricultural Record* holds that there is consequently a loss of 20 per cent in weight and that therefore 64/ per cwt. for Trinidad cocoa is equal to 81/ for Ceylon.—ED, *T. A.*

It is very important for our readers to bear in mind, that *Criollo and Forestero* do not respectively stand for the types of *Ceylon and Trinidad Cacao.* Ceylon has both the varieties no doubt *pure* and they may be of equal value—with us both types have degenerated and are characterised by a large proportion of *very* flat beans. That is our difficulty.—ED.

NATIVE AGRICULTURE IN INDIA.

You may train up a child in accordance with the most beautiful theories in the world, and the result will be disappointing if you do not feed him at the same time. Here in India we have an immense number of people living on the verge of starvation. We cannot feed them, and those who are grown up must continue to find their way to Nirvana with a stomach seldom or never full and very often empty; but if we can bring ourselves to abjure the words of antiquated masters, we may be able to do something for the children of the rising generation by teaching them to find more food for themselves. The discovery of a new art, the adoption of an improved process, the invention of a new implement, each and all are equivalent in an agricultural community to the finding of a great granary, the existence of which was hitherto unexpected, and there is no good reason to suppose that the arts, processes and inventions suitable for the tillage of Indian soil have already been perfected. The native cultivator is no doubt, when the hopelessness of the struggle to better his position does not drive him to despair, wonderfully skilful up to a point; but it is the point where science only begins, and to say that the discoveries of physical and mechanical science have nothing to teach us in agriculture is to shut our eyes to the experience of Europe during the last hundred years. No doubt the native cultivator thinks he has got as far as he can: Squire Western also would have laughed at the notion of a steam plough: but this is no reason why those who know better should agree to think so, or despair of persuading the native to change his mind.

Past experience, however, with its record of abortive experimental farms stored with model implements never leading to copies, shows that to attempt this from the top is to attempt an almost impossible task. We must begin at the bottom: we must take the child, while yet years of routine on the paternal homestead have not induced the conviction that his father knew as much as it was possible to know; we must teach him first of all to look on agriculture as an occupation in which improvement is always possible; and we must impart just such a rudimentary instruction as will give him a glimpse of the direction in which this improvement may lie, and inspire him to take that road. When we have done this our experimental farms, our agricultural exhibitions, our scholarships to send one or two in a hundred and fifty millions to a technical English school, will catch on, if we may use an Americanism, in a way they have never done before. Sir Edward Buck stated that proposals for carrying the recommendations of Dr. Voelcker into effect would shortly be made; but whatever the precise nature of these recommendations and proposals, the foundation of all must be laid in the ordinary school. If this is done, the boy who can afford to wait at school and go on to college, will carry with him from the outset the knowledge that success in agriculture is a worthy aim, which demands education as well as clerking, or schoolmastering, or scribbling, or pettifogging: the boy who cannot, will at least carry back to the fields the spirit of inquiry, the parent of progress in agriculture as in every other sphere of human activity and effort.—*Pioneer,*

HOP TEA.

A few months ago we noted that a factory had come into existence at Madestone, in Kent, where the preparation of "hop tea" was being crrried on. This product has now been placed on the market by the Hop Tea Company, of Eastcheap, London. It is sold at the rate of 2s. and 2s. 6d. per lb. The blend is made of Indian and Ceylon teas, to which is added by a special process the infusion of hops. It is claimed that some of the worst properties of the tannin are obliterated by the hoppy flavour, and a certain sedative element introduced. It cannot be denied that in the majority of Indian and Ceylon teas there is a rough, strong, taste, which, indeed, has made it one of its chief recommendations to the poorer classes. Anything which in part removes this harshness improves the tea, whilst the suspicion of hops introduced is agreeable, and likely to find favour with many. China tea, it will be understood, does not so readily lend itself to the manipulation, nor, indeed, does it stand so much in need of being softened down. The idea seems to have been a happy inspiration to remove the astringency of the tea and introduce the tonic property of the hop. Medical opinions give it that many persons who have hitherto been debarred from indulgence in tea, owing to its astringent properties, may with greater impunity embark on a trial of the hop-flavoured article.—*L. & C. Express.*

Coffee.—A small amount of Kona coffee has been imported from the Hawaiian islands, where it is grown, into San Franciso, but so far receipts have been light. An appropriation of $10,000 was made by the last legislature of Hawaii to be devoted to the encouragement of coffee raising, and the import duty on foreign coffee was raised to 6 cents per pound, an increase of 3 cents. Although coffee is grown in several of the islands comprising the Hawaii group, the Kona district on the island of Hawaii has been found the best producing section on account of most favorable climatic conditions, and it is from this section that Kona coffee comes. The bean somewhat resembles the Costa Rica coffee, but the aroma, odor and flavor are entirely different from either that or any other sort of coffee. It is said that in the islands this coffee is used almost entirely, and strangers, tourists and other visitors who taste it consider that it makes a most delicious beverage.—*American Grocer*, Nov. 12.

Mr. Horne, the Director of the Public Forests and Gardens of the Island of Mauritius, has furnished an elaborate report on the industries which it is desirable to foster in the present depressed state of the sugar trade. Mr. Horne does not doubt but that in the future, as in the past, the cultivation of the sugar-cane must be the principal occupation of the agriculturists of the island, but he points out that many other resources are open to them, and recommends, moreover, the appointment of an agricultural chemist to advise in matters connected with Sugar-cane growing and its management. Mr. Horne suggests, in addition, the extended cultivation of Coconut Palms, Cacao or Chocolate, Coffee, Tea, Dates, Oilnuts, Elais, Betelnuts, and other Palms, various cereals, starches, Indigo, Anatto, oil-seeds of various kinds, Bananas, Pineapples and other fruits, Ginger, spices, fibre plants, cotton, silk, indiarubber, Tobacco, dyewoods and a variety of other plants and their products—a list which will give some idea of the resources that are open to the cultivator in the tropics if other circumstances be propitious. Cinchona does not prosper in the island.—*Gardeners' Chronicle.*

MINING AND GEMMING IN CEYLON.

In a recent letter our London correspondent referred to the want of success which had attended the gemming operations of the past year, or past few months, in Rakwana, as telling against the credit of this Colony—and especially of local gemming and mining projects—in the City of London. The writer was too polite to say it openly, but he evidently implied that the non-success of the enterprise begun under the auspices of a Limited Company was the more remarkable in view of all that had been written in our columns in support of the industry and the many arguments in favour of investment which we had used. The inference in fact was that experience had shown the fallaciousness of our information and writings and the result threw discredit on any proposal to apply English capital to the development of gemming and mining enterprise in Ceylon. Now we beg most strenuously to object to this line of inference and argument and to protest that, up to this date, there is nothing in the operations undertaken nor the experience gained, which affects the main position we have from the first taken up, and held in reference to this branch of local industry. Our position, so far from being undermined by the work of the past year or six months, remains in fact untouched and we hold to it as strongly in the face of English capitalists as ever we did. The whole tenor of our writings has been to the effect that the Gem-digging industry of Ceylon has given employment to hundreds and thousands of natives, almost from time immemorial—that it is undeniable large numbers of sapphires, rubies and catseyes—not to speak of less valuable stones—are continuously found and sold by the gemmers to native dealers who export and sell them in India or in Europe, without any notice of by far the larger proportion of such exports being recorded in our Customs accounts. The term "precious stones" has been synonymous with the name of Lanka for all the centuries back to, and even before the Christian era, and there is no evidence that our gemming country has been by any means exhausted. On the contrary there is strong evidence to show that considerable areas of gemmiferous land remain untouched to this day. What we pleaded for then was not simply the introduction of English capital to buy up such land and to work at it after native fashion—which is all, the Gemming Companies at work (is a small way) have done; but above all the introduction of machinery and of the latest appliances so as to give a fair test to selected fields for the first time in history under the modes of working recognised as successful in the Diamond Fields of South Africa. Now this is exactly what up to date has not been done. Two Gemming Companies with limited capital have been at work—but it has been at work very much after the native fashion, with native contrivances more or less adapted, but still coming far short of the latest European appliances. The consequence has been that no proper scientific tests have been applied, and it has become notorious for native employees to make a bolt, leaving a balance of wages due to them without claiming it. Again, we have heard that all the parcels of stones and gem débris sent down from the only Rakwana Company's pit, on being shown to an expert in Colombo, has resulted in the constant enquiry—"Where have the good large stones gone to?—this is just the stuff in which they are always found; but there are no stones here save those of little value." Latterly, we understand the Company at work in the field under London auspices,

has started making a new machine to supply the need most felt in and at the gem pits; but it is not yet completed and until it is in full operation, its work cannot be judged. But even then, we question whether this machine constructed on the spot will answer its purpose so well as the complete but expensive machines constructed in England for the South African Diamond Fields. It is such machinery that we should like to see applied and tested in the Gemfields of this Colony. No test worth speaking of has yet been applied. And yet all this time, splendidly fine large stones have been brought to Colombo, exhibited and sold, or sent away privately.

We maintain, therefore, that so far from discredit being thrown on Ceylon by what has taken place in our Gem pits during the past year, we are very much in the same position as when we first called on English capitalists to establish a Syndicate or Company and set to work with proper machinery. We have not written of positive, assured success. That is a matter we left business men and capitalists to judge for themselves from the facts placed before them. All we urged was that Ceylon undoubtedly had further stores of gems, that there is a large profitable digging and export trade and that with the use of the latest and best machinery, there was every reason to believe European Companies could compete and obtain a good return on their investment.

ESTIMATED SUPPLY OF ALL TEA TO 30TH JUNE 1891, AND PROBABLE STOCK ON THAT DATE.

	INDIAN	CEYLON	CHINA	JAVA
Present Stock	39,000,000	8,000,000	44,000,000	702,000
To arrive, say	21,000,000	22,000,000	8,000,000	1,750,000
Total	60,000,000	30,000,000	52,000,000	2,452,000
Delivery for 5 months, say	45,000,000	19,000,000	33,000,000	1,500,000
Stock—30th June 1891 ...	15,000,000	11,000,000	19,000,000	952,000

STOCK.

	Estimated 1891	Actual 1890	Actual 1889
Indian	15,000,000	19,317,000	21,324,000
Ceylon	11,000,000	9,670,000	8,175,000
China	19,000,000	34,274,000	31,905,000
Java	952,000	1,059,000	1,130,000
Total	45,952,000	64,320,000	62,534,000

STENNING, INSKIPP & Co.,
9, Great Tower Street.

6th February 1891.

THE CONDITION OF ST. HELENA.—Mr. Antrobus, of the Colonial Office, who has lately been acting as Governor of St. Helena, concludes a recent report on that colony by saying that many of the civil servants have to discharge responsible duties with inadequate pay, and all the inhabitants are suffering more or less from the general depression. "It is melancholy to contemplate the present condition of an island which was once so flourishing and still has so many points to recommend it. There are still the wonderfully healthy climate neither too hot nor too cold, the beautiful scenery, the mixture of tropical and temperate vegetation, the rare indigenous plants, the clearly and marked geological structure, and the historical associations derived from the rule of the East India Company, the imprisonment and death of the great Napoleon, and the visits of Halley and Darwin and other distinguished men of science. But the ruins of well-built country houses, and the deserted cottages, which are to be seen in every direction, as well as the returns of the rapidly diminishing revenue, afford evidence of the change which has taken place in all that constitutes material prosperity; and I regret that there is at present no sign of any improvement. —London *Times*.

MINING AND GEMMING INDUSTRIES IN CEYLON.

The attention of Mr. Barrington Brown during his presence in the island, seems to have been confined to the province of Sabaragamuwa. No doubt it includes within its bounds, nearly all the recognised and well-established gemming districts, and possibly quite enough to occupy the time of the geological and mineralogical expert during a few months' stay. But it is undeniable that districts in other provinces also deserve the expert's careful examination. In the Galle and Matara divisions of the Southern Province; in the province of Uva; and in the Nuwara Eliya, Pussellawa and Maskeliya districts of the Central Province and again along the course of the Mahaoya to the North-Western Province, "gems" or "gold" are by no means unknown finds. As regards plumbago, again, the Kurunegala and Kegalla districts call for very careful attention, quite as much as the Ratnapura, Kalutara and adjacent divisions.

But even if we confine our attention altogether to Sabaragamuwa—and notably to the Ratnapura and Rakwana districts—we believe we shall find that Mr. Barrington Brown has been able to give the London Syndicate employing him, such information as amply justified his mission and most fully supported the position we have taken up for many years back in regard to our Gemming Enterprise. Of course the expert's attention was mainly directed to certain allotments of land either leased, purchased or under offer to his Syndicate and it is with reference to the value of these, and to the results of various testing operations that his report must be mainly directed. Nevertheless, he was able to enter on some general remarks descriptive of the position of the gemming country examined by him and of the geology of this part of Sabaragamuwa. Gneiss, of course, forms the chief rock encountered. It is of a bedded character and contains layers of graphic granite and hornblendic gneiss often seen gradually passing into the gneiss at the planes of contact; while in some few instances there is granular limestone. The expert alluded to the fact that as yet no precious stones have been discovered in the matrix which, in his opinion, will be found to consist of gneiss, graphic granite and granular limestone. The frequency with which garnet crystals of small size occur in the gneiss and granite—a circumstance often remarked upcountry —is alluded to. We believe the special mission of Sir Samuel Baker, the celebrated traveller, on his last visit to Ceylon, was to discover the matrix of some of our precious stones and with this purpose, it was stated at the time, with how much accuracy we cannot say, that Sir Samuel and a well-known enterprising public officer, explored hammer in hand, a good many rocky valleys high up in the Highlands of Uva, Nuwara Eliya and Sabaragamuwa, but apparently without success. Possibly Mr. Barrington Brown would be able to show them that they had not gone properly to work to find the matrix, if indeed it still exists to any extent. For, we know that by the decomposition and disintegration of the mountain rocks, the gems contained therein in crystalline form having been freed and are now to be found in gravelly deposits on hill sides bordering mountain streams—as in so many parts of Rakwana—or in alluvial layers of gravel covered and deposited in the valleys. In the former case, the natives have done a great deal of systematic work in mining and gemming, sinking "shafts" or entering "drives" in the hillsides, while in the valleys, the process is one of dredging with hoes under the river

beds, or of sinking of pits alongside. Meantime, we have the fact before us that by such simple, not to say primitive processes—almost entirely hand labour—the Sinhalese gemmers in Rakwana and Ratnapura have, from time immemorial, obtained precious stones, chiefly sapphires, catseyes and rubies while still, undoubtedly, there continue to be found many valuable stones of these descriptions.—We may have further information to give in our next.

LININGS FOR TEA BOXES.

The explanation afforded by our London Correspondent in his letter by yesterday's mail will relieve the minds of Messrs. Anderson and Maitland Kirwan of any feeling that the remarks we passed in our article headed 'Lead Linings for Tea Boxes' were of application to the patents these gentlemen severally represent.

As regards Mr. Maitland Kirwan's paper, it was of course, altogether excluded from the category of linings with which our remarks dealt. Reference was intended by that article solely to those forms of linings into the composition of which lead entered. Mr. Maitland Kirwan's material has no such character. It is what seems to be known as a "butter *paper*," and it is of this lining of which Messrs. Wilson, Smithett & Co. wrote in such complimentary terms in their Produce Circular some time back. But it must be borne in mind that an important element of the question in the relative value of linings of all descriptions is the one of cost and certainly we were not prepared for the revelation as to comparison between the paper and lead now afforded us. We had written previously under the belief that the "paper" would be the cheaper lining of the two. We are told that the rate at which 4-ounce lead can be used is about 1s 3d per chest, while Mr. Maitland Kirwan's paper is quoted—according to our London correspondent—at 1s 4½d per 100 lb. chest. For boxes holding a less quantity our correspondent could obtain no quotation. But when we refer back to the correspondence which arose in our columns in January last, we find that the difference in cost was even then fully apparent. It was stated by planters, without contradiction, that using 5-ounce lead which is now generally preferred, the cost per chest was equal to from 72 to 83 cents on the estate against 1s 4½d for Mr. Maitland Kirwan's paper *in London*, or probably a figure not far short of a rupee on the estate.

The same element—that of cost—would have excluded from consideration the lead paper known as "Clark's Patent" which Mr. T. C. Anderson has advocated. For this we have from London no quoted price; but as the 4-ounce lead with which this paper is coated is equivalent in substance to that commonly used for lead linings pure and simple, we must presume that the cost of adding that amount of lead to paper must involve a price very materially in excess of the use of a similar weight of lead when applied alone. That the combination employed under "Clark's Patent" may be most useful, and that this fact may well justify the extra cost its employment may involve, we do not deny; but this does not enter into the scope of our present contention. It will, of course, be acknowledged that this question of relative cost is one of primary importance to our planters. What we want to obtain is a lining which, while equally efficacious in preserving tea as is a simple lead lining, shall be superior to it in economical result. This, according to our present information is scarcely obtained by either Clark's lead paper or Mr. Maitland Kirwan's "butter" paper. Both o them, no doubt, are exceedingly efficient and reliable, but they are both more costly than the material in ordinary present use.

As for the tin-foil paper, which we are told the remarks formerly made were more specially intended to apply, there seems little cause to doubt that it does not afford a reliable lining for tea boxes even though its cost may be below that of our present staple material. It would be poor economy to save a few pence on every chest of tea packed while having no assurance that its contents would reach the London market uninjured. As yet therefore—price for price being taken into account—it must, we fear, be admitted that we are without a satisfactory substitute for lead. Lead has been proved by long experience to be a very efficient material for packing tea in chests. We are reminded, however, that Messrs. Wilson, Smithett & Co. would gladly see something substituted for it. For in the first place, even the best of sheet lead will only bear a certain amount of handling. The packets, it is asserted, which are retailed in lead, deteriorate if they are subjected to a long course of rough handling. Much "pinching"—to use the term which seems to indicate the course of such rough handling—will, if long continued, crack the lead, and the contents of such packets will deteriorate greatly. But Messrs. Wilson, Smithett & Co. point out a second reason why some alternative to lead would be welcomed. This is the fact that, should the wood of the chest be not properly seasoned, and consequently exude any sap, the result is to produce "acetate of lead," which not only destroys the lining but most seriously affects the tea enclosed. It is to such a cause that the "cheesy" smell and flavour of a large quantity of Ceylon and Indian teas returned upon the Brokers' hands, has been attributed. The "butter" paper of Mr. Maitland Kirwan, if used, might obviate all chance of this particular cause of deterioration. Would it not then be possible for this material to be reduced in price? Messrs. Wilson, Smithett & Co. have borne evidence to the protection it has afforded to teas sent home in it, and the objections raised to lead now referred to, do not attend its use. If a longer experience of this "paper" were to justify Messrs. Wilson and Smithett's conclusions, we have little doubt that a reduction in its cost would ensure for it a wide adoption by our planters. Meantime does not the course of this discussion in our columns and the many points which are still necessarily left open questions, show the need, in the planting interest, of that "P. A. Sub-Committee" to enquire into and test new inventions and economical processes, which we suggested some time ago and which suggestion has been supported in our columns by not a few planters. If Mr. Giles Walker distinguished his year of office, by the establishment of such a Sub-Committee, we think he would do a good thing in the interests of the planting community.

ANTIQUE DIAMOND DRILLS.—Mr. Flinders Petrie has originated the theory that the ancient Egyptians were familiar with the diamond drilling device. In his "Pyramids and Temples of Gizeh" illustrations are given of samples of work which apparently show the use of jewel points in drilling and sawing. Various samples of this work are in his possession. He cites six examples in the Bulak Museum and at Gizeh. In a temple at Gizeh there is found in one of the lintels of a door a drill hole with the core still sticking in it. A base of a tube drill hole is also found between the feet of a statue of Chefren now preserved in the Bulak Museum. —*Indian Engineer.*

CINCHONA IN THE DUTCH MARKET.

Amsterdam, February 6th.

The Amsterdam auctions on February 26th will consist of 2,941 bales, 156 cases (about 239 tons) divided as follows:—Java bark: From Government plantations 323 bales, 37 cases, about 28·5 tons; from private plantations 2,618 bales, 116 cases, about 210·5 tons. African cinchona bark: 3 cases, about 4·29 cwt. Druggists' bark: Succirubra quills, 132 cases; broken quills and chips 68 bales; root 23 bales; C. Schuhkrafft quills 6 cases; Lancifolia quills 5 cases; broken quills and chips 11 bales. Manufacturing bark: Ledgeriana quills 10 cases; broken quills and chips 2,165 bales; root 408 bales; Hybrids broken quills and chips, 200 bales; root 56 bales; Officinalis broken quills 10 bales. Total 2,941 bales, 153 cases.—*Chemist and Druggist.*

NOTES ON PRODUCE.

Coffee and Chicory.—A Liverpool firm have been accustomed to sell the so-called "French coffee" in pound canisters, price one shilling; and, as they took the precaution to affix a label warning the purchaser that he was buying a mixture of chicory and coffee, they probably considered themselves free from either legal or moral offence. As their legal representative virtually put it: "Some people prefer chicory; we sell the mixture; they know what they are buying, and there is an end of the matter." The Liverpool magistrates, however, reason differently, and insist that even under these circumstances "fully one-third, or probably much more," chicory is excessive. Hence they have imposed a fine, but the Liverpool firm have determined to appeal.—*H. and C. Mail.*

TEA IMPORTS, DUTIES AND PRICES IN AMERICA.

Tea importers and dealers are not a little interested in the bill before the House of Representatives to re-establish the former discriminating duty on tea shipped from ports west of the Cape of Good Hope. Prior to 1883 the following provision stood in the tariff law: "There shall be levied, collected and paid on all goods, wares and merchandise of the growth or produce of the countries east of the Cape of Good Hope, except wool, raw cotton and raw silk, as reeled from the cocoon, or not further advanced than tram, thrown or organzie, when imported from places west of the Cape of Good Hope, a duty of 10 per cent. ad valorem in addition to the duties imposed on any such article when imported directly from the place or places of their growth or production." This discrimination in favour of direct imports came down from the early days of the Union, having been established originally for the purpose of encouraging the carrying trade with the East Indies and China. The opposition to it has been based in part at least upon the belief, which the statistics confirm, that it was in reality special legislation against imports from London. At the same time rival commercial interests have come to be involved in the matter.

The imports of tea into the United States in 1889 amounted to 79,575,984 pounds, of which 40,751,789 pounds came from China and 33,303,437 pounds from Japan, 260 927 pounds from the British East Indies and 203,825 pounds from Hong Kong. This leaves but 5,056,006 pounds from ports other than the places of production, and of this quantity England furnished 4,673,864 pounds. The remaining 352,142 pounds is the only evidence which can be furnished that the law would have a general meaning and not a specific one. Under free entry the increase of indirect imports has been very small, but such imports being forced upon the market at critical times have had considerable influence, it is claimed, in breaking values.

The disturbing influences in the tea market have been many, and it is therefore difficult to specify any principal cause as having affected declines or advances in values. The recent advance in silver has naturally disturbed prices in the East, silver being the sole circulating medium in China. The financial stringency in this country and England has likewise compelled many holders of tea to liquidate, though it is to be said that the fact that failures among tea merchants have been so few is a forcible illustration of the strength of the market. These financial troubles have caused a weakening in prices and checked the advance started through the rise in silver.

The stock of tea in this country is at present very heavy, and prices are in consequence lower here than in England. Hence London merchants are now buying tea in New York. The promoters of the new legislative agitation hope by means of it to buoy up prices and prevent a further decline. But many dealers have been free to predict that no such legislation will be passed by the present Congress. It is claimed by the advocates of the measure that under free entry London merchants are able to place here large quantities of tea whenever the market shows a tendency to advance. London merchants derive an advantage over our importers through the difference in cost of transportation. Freight rates are lower between China and London than between China and the United States. The former duty, of course, benefited to some extent steamship lines running between tea centres in China and Japan and the ports along our Pacific coast. Canada formerly bought the larger part of her supply from the United States, but since 1883 the tendency to buy of London merchants has increased, while the trade with the United States has fallen off. Our imports from London, which comprise about 5 per cent. of the total annual receipts, are mostly inferior teas. To prevent a further weakening in values by forcing large quantities of tea upon the American market shippers are now holding 70,000 half-chests of Formosa tea in Amoy.

The annual imports of tea between 1880 and 1889, inclusive, were as follows:—

	$		$
1880 ...	19,782,631	1885 ...	14,047,583
1881 ...	21,004,813	1886 ...	16,020,383
1882 ...	19,392,102	1887 ...	16,771,802
1883 ...	17,302,849	1888 ...	13,360,685
1884 ...	13,636,053	1889 ...	12,654,640 *

Secretary Rusk thus speaks in his annual report of the investigations of his department in regard to the adulteration of beverages: "These investigations show that the adulteration of such articles is not very extensive, and, except in the case of tea, is easily distinguishable. The most frequent one is the introduction of substances to give additional weight, such substances as will attach themselves readily to the leaves, and yet not be easily distinguished by the eye. These substances are mostly of a harmless character, although some of them have been found to be deleterious."

Importers and dealers declare that no foreign substances are added, and the use of the term "adulteration" is misleading. When the leaves of the tea plant become mature no more nutriment is furnished them by the plant except what is just sufficient to maintain life, the sap being supplied to the younger leaves and buds. The older the leaf the less valuable it is, as it becomes hard and woody, and thus loses its nutritious properties. These leaves are frequently worked in with more valuable products, but they are not adulterants under the common meaning of that term. The chemical solutions to which the leaves are subjected, it is claimed, are to give them a uniform color and not to add to their weight. An expert can easily detect the presence of the old leaves. The yield is so abundant that the necessity of adulterating tea is thought to be very small. The production is constant, and not, as in the case of vegetables and cereals, subject to the seasons.—*Bradstreet's.* [True of Ceylon, but not of India and China, which have a winters.—Ed. *T. A.*]

* The figure for 1890 will be over 14 millions of dollars.—Ed. *T. A.*

LINING OF TEA CHESTS: LEAD *VS.* PAPER, &c.

Every effort has been made by me this week to assure myself respecting the fullness of the grounds upon which the criticisms passed by me in a former letter of mine on the substitutes proposed for the lead lining of tea chests were based, and for the result to which—as set out in your article of comment on the subject—you, with perfect justice, held me to be responsible. I sought in the first place an interview with two old Ceylon planters now at home, both of them men of great local experience in Ceylon and both very largely engaged in dealing with your teas in London. I can best communicate to you their views by giving you as nearly as possible the words of the elder and more experienced of my two interviewors, both of whom—were it authorized to me to mention their names—you would acknowledge to be among the highest possible authorities on such a subject. The senior of these remarked to me:—"I have read all that you and the *Oserver* wrote on this subject of lining tea chests, and I may express my fullest concurrence in anything that has been written by you both. Stick to your guns: don't you be driven from the position taken up by you. The particular lining you saw—and which we have all seen—penetrated by innumerable small holes is what is known as a tinfoil paper. None of us will ever use it again, despite the fact that its first cost is much below the cost of 4 ounce lead. I see Mr. Maitland Kirwan complains of the remarks made by the *Observer*. He certainly has no right to do so, for his lining is not a lead paper at all, and your remarks were confined to linings of that character. What Mr. Maitland Kirwan proposes is the 'butter' paper formerly shown you. We have nothing whatever to say against the use of this material save that its cost is higher than that of pure lead, which I use at about 1s 3d the chest, and this fact tells naturally against it, as it does not give better results than lead. Then as to Mr. Anderson's lead paper, that known as Clark's patent, the *Observer* should surely have recollected letters written to it by some planter who has used it pointing out that the cost of it was very greatly in excess of simple lead. This must naturally follow from the fact that Clark's patent adds to the cost of the 4-ounce lead that of backing it with paper. It is no doubt capital stuff, but the cost excludes it from the category of linings respecting which you wrote, as these included only those from the use of which an absolute economy as compared with that of lead was to be anticipated. What we want is a *cheap* substitute for lead. The last answers every needful purpose, and we are not likely to adopt any alternative material in lieu of it which will involve extra cost. In my opinion Messrs. Anderson and Maitland Kirwan, when writing in complaint of tho *Observer* article, should not have left the higher price of their materials without mention. The fact that they did so did not enable general readers to fully understand the case."

Immediately after terminating the interview of which the results have above been given, I went and saw both Mr. Wilson and Mr. Smithett on the subject. Those gentlemen told me they had read all you had published relative to it. They kindly looked up their own circular in which they had praised Mr. Maitland Kirwan's lining, and they said that, although their experience of it had fully justified what they had written, they knew nothing as to the cost of it. The teas consigned to them and packed in this butter paper had arrived in admirable condition, and they should be very pleased if fuller experience should justify the supersession by it of lead. "For," Mr. Smithett remarked, "although we do not believe that the contact of lead with tea is in any appreciable degree injurious, there is no doubt that if unseasoned wood has been used for making the boxes a lead lining is likely to be a very dangerous one. When we lately complained of the 'cheesy' smell and flavour of a quantity of Ceylon teas received by us, we had them submitted to analysis, and it was found that they were strongly impregnated with acetate of lead. This was the result to the action of the acid of the wood on the lining, and it had eaten away the latter and had fouled the tea to such an extent that after sale we had a very large quantity of the chests returned to us, and a very heavy loss had to be borne when finally obtaining a purchaser for it. What we want, therefore, is to see lead superseded altogether. As long as it is liable to action by acid from the wood the danger mentioned will always be present."

After leaving Messrs. Wilson and Smithett I proceeded to call on Mr. Maitland Kirwan. Unfortunately that gentleman was out, but to my request in his office for a quotation of the price of the "butter" paper linings it was given me as 1s $4\frac{1}{2}$d. for a 100 lb. chest. On my asking the price for half-chests it was replied to me that they had no quotation for the lesser sizes. This information was confirmatory of what had been mentioned to me in the interview first recorded. You will see that the question resolves itself finally into this, viz. that there may be efficient substitutes for lead, but that none of them meet what my letter stated to be desired *i. e.* a substitute for it which should be less costly. When my letter to you was written neither Clark's patent nor Mr. Maitland Kirwan's paper were in my mind, and only the second had ever been under my own observation.

UNITED PLANTERS' COMPANY OF CEYLON LIMITED: £250,000 CAPITAL.

There has been a "mighty big thing" in connexion with Ceylon started this week, and this has been done so quietly that even Mr. Leake, on my mentioning it to him this week, told me he had not heard even a whisper about it before my telling him of it. The following referring to this new enterprise is extracted from the *Investors' Guardian* of Saturday last:—

United Planters' Company of Ceylon, Limited.

This company was registered on the 3rd instant with a capital of £250,000, in £10 shares, to acquire properties in Ceylon, and to carry on the business of tea and coffee-planters generally. The subscribers are:—

	Shares.
*H. Brooks, St. Peter's-chambers, Cornhill, merchant	1
Hy. Brooks, St. Peter's-chambers, Cornhill, mechant	1
*H. T. Brooks, Redlands, Upper Long Ditton, Surrey, merchant	1
*J. M. Boustead, Westfield-lodge, Surbiton, merchant	1
A. O. Shroft, 29, Groombridge-road, South Hackney, clerk	1
I. D. Tarr, 7, Liston-road, Clapham, S. W.	1
P. Pears, 18, Leigham-lane, Tulse-hill, S. W., clerk	1

The number of directors is not to be less than 3, nor more than 7; the first being the subscribers denoted by an asterisk; qualification, £500 in stock or shares; remuneration to be determined by general meeting. Solicitors, Messrs. Parker, Garrott and Parker, St. Michael's Rectory, Cornhill, E. C.

Calling the other day at the office of the solicitors to the Company, it was told me that no

prospectus whatever had been printed, that the association was in fact quite of a private character, and that details could not be communicated to me. It was not yet decided whether any public subscription would be sought. If it was eventually decided to do this, it would only be for the sake of obtaining a quotation on the Stock Exchange. But although my inquiries in this quarter had so little of success, it reached me from another that the venture was mainly in the hands of Messrs. Brooks & Bousfield, and the properties with which the Company will deal were mentioned to me; but I was requested not to publish either the names of these or of their proprietors, as to do so, it was thought, might be harmful and might give offence. Most likely the names published in association with the registration of the Company will afford you the clue which it is forbidden to me to give you.—*London Cor.*

TEA INFUSION.

(*From a Correspondent.*)

I spent some minutes testing the boiling of water. In these busy times no one could afford to wait long enough for the Japanese *third* stage referred to by Sir Edwin Arnold. Still for one's own edification, enlightenment, and it may be gratification, I would suggest the testing of this Japanese style of making tea with honorable "old hot water." There may be something in it—who knows? It is a fact that the "G. O. M." does not care to drink tea *unless it is prepared for him by Mrs. W. E. G.*, and yet the old man is very partial to tea. Can it be that Mrs. Gladstone has got some secret, or does she adopt the Jap's plan? If so she should be asked to reveal it *pro bono publico*. I have no doubt she would if she were only asked. Then why not ask her in Ceylon's name, sending her 100 copies of the tea Leaflets? *We all* know that we prefer tea made by some few people to all the tea we are offered by others. So there is *an art* in the process, and Mrs. G. I have no doubt would readily grant us every assistance. It is worth trying for.

The Tea Leaflet published at your office, I fancy, will have helped to check the baneful practices of taking a second brew and allowing the tea to draw more than 5 minutes. If so it will have done some good and helped on consumption in the U. K. and elsewhere, although the number of consumers may not have very considerably increased. But in the long run deliciously made tea MUST increase the number of consumers very considerably throughout the world. Attention all round seems now being given to tea—see page 28 top para. in the *World*, 28th Jan. 1891. "Over the Tea Cups" is Dr. Holmes's new work, and it ought to be good coming from the author of the "Autocrat of the Breakfast Table"; but I suppose it will have very little to say about tea *itself*?

Considering that Sir Edwin Arnold took the English belt as a tea drinker while he was in Japan lately by drinking about 80 *Japanese* cups of tea daily, I think the Ceylon Tea Fund made a mistake in not presenting him with a small box of Ceylon's choicest leaf when he passed through Colombo a week or two ago. But Ceylon tea is rushing ahead so steadily in the world's favor just now that it exemplifies the old saying "good wine requires no bush."

You should obtain from Calcutta one or two electroplated *Bengal Tea Sulkies*. They cost but very little and beat the egg-shaped tea leaf dippers *hollow*. By the aid of these sulkies everyone can make tea to her or his liking and without trouble. The lower portion is of fine gauze wire and far better than china ware.

All you want then is one of Messrs. Walker's American kettles big enough for tea making purposes, of the *finest* quality of thin sheet iron,—the water boils *rapidly*,—oval-shaped lid at *back* and handle in *front* there is no danger of scalding one's hands by the steam issuing from the lid.

PLANTING PRODUCTS:
COFFEE—CACAO—CINCHONA.

(*From the Annual Report of the Badulla Planters' Association, held 14th Feb. 1891.*)

Coffee.—Your Committee congratulate you upon the improved appearance of coffee in the districts. Seasons have been more favourable for this cultivation of late, crops are good and prices for the old staple are all that can be desired.

Tea.—Tea now fast becoming our leading product is making most satisfactory progress in all the districts comprising your Association: at the present time more than 10,000 acres are under this cultivation and a large area is being planted up yearly. The exports of tea from Badulla, Madulsima, Hewa Eliya and Monaragala districts for 1891 are estimated at 2,000,000 lb. This is a good yield considering that so large a proportion of the acreage is only recently planted and is not yet in bearing. Tea cultivation in the Badulla district promises to be exceedingly remunerative in the future, and your Committee congratulate you upon this.

Cinchona.—This product, your Committee regret to say remains in the dull and depressed condition reported last year. No improvement in prices has taken place. The exports from the Badulla and Madulsima districts for 1891 will be about 2,000,000 lb., a lower total than for some years past. Statistics for cinchona bark are more favourable, but the depressed market, your Committee believe, is owing in a great measure to the fear of increased supplies from Java. No great fluctuations in prices have occurred during the past year, the unit ranging from 1½d to 1⅞d. Your Committee are, however, hopeful that with a steady falling off in exports from Ceylon some improvement in prices will take place during 1891.

Cacao.—Your Committee are pleased to report the continued successful cultivation of cacao both in Monaragala and in other parts of the district. The past season has been very favourable, and there has been very little helopeltis: in fact where shade has been used from the first there is none to be seen. As the trees get older the blossoms set more favourably and crop increases. Prospects for the coming year are very good and with the price at 115s per cwt. there is no doubt that cacao is a product second to none. The acreage under this cultivation is from five to six hundred acres.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Feb. 12th.

CINCHONA.—At Tuesday's auctions a very moderate quantity of bark was offered, the catalogues comprising only:—

	Packages		Packages	
Ceylon cinchona	887	of which	825	were sold
East Indian cinchona..	1,440	do	1,183	do
Java cinchona	39	do	32	do
South American ciuchona	582	do	39	do
Total	2,928	do	2,079	do

The assortment of bark was rather poor, especially that of Ceylon cinchona, but Succirubras from India were well represented, and included one parcel of not less than 20 tons weight from the Wentworth plantation. It was generally expected that prices would rule lower, quinine having been greatly depressed during the week, and it was said that several holders of Indian and Ceylon bark had given instructions to sell at any price. The prices realised were somewhat irregular, but decidedly easier all round, and the unit cannot be placed at a higher average than 1¼d per lb.

The following are the quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick factory	157,493
Agents for the Mannheim and Amsterdam works	142,294
Messrs. Howards & Sons	43,015
Agents for the French, American, &c., works	30,682
Agents for the Auerbach factory	27,484
Agents for the Frankfort o/M. and Stuttgart works	22,905
Mr. Thomas Whiffen	2,440
Sundry druggists and spectators	39,780
Total quantity sold ...	466,093
Bought in or withdrawn	148,673
Total quantity sold ...	614,766

QUININE has attracted a considerable amount of attention this week, and the total transactions reported since last Friday amount to about 320,000 oz., of which 130,000 oz. changed hands today. On Monday the drop in price reached its lowest depth, in a small sale of German bulk quinine on the spot, at 10d per oz., a price which beats the record. It is true that the authenticity of this sale is doubted in many quarters, but there is no question that at one moment the drug was freely offering at 10¼d per oz. Several buyers then entered the market, which thereupon took a turn for the better, and kept on improving until today, when 10¾d per oz was freely paid for delivery up to May. The price of 11d per oz is now again generally asked. Howard's brand has been reduced to 1s 3½d per oz for bulk, and 1s 5½d for vials.

CINNAMON.—A sale of 100 bales is reported to have been made recently at 6⅛d per lb., c.i.f. London terms, for February-April shipment, usual assortment.

NOTES ON POPULAR SCIENCE.

By DR. J. E. TAYLOR, F. L. S., F. G. S. &c., EDITOR OF "SCIENCE GOSSIP."

I notice in the last number of *The Australasian* to hand that Mr. John M'Lellan, of Dimboola, has ingeniously turned the tables on the Locusts by planting patches of larkspur among his crops. These voracious insects devour "every green thing," but they could not digest larkspur leaves, so they died. The larkspur is a member of the most poisonous and otherwise objectionable order of plants in the world, the ranunculaceæ or buttercup family. The seeds of the larkspur were formerly ground to powder and used as a vermin killer. So intense is the poison that it is and must be used homœopathically. I mention this because the planting of larkspur indiscriminately may do more harm than the locusts. There is one plant among the vast number composing the natural order leguminosæ, which can lay claim to being a fodder plant and a poisonous plant at the same time. Let some young farmer plant patches of lupins instead of larkspurs. I venture to say they will be equally fatal to locusts, and they have the advantage of being a good sheep fodder, capable of growing on the lightest and hungriest of soils, where few or no other plants could grow.

It is as well to note a fact recently discovered, that artificial stone cements abounding in magnesia have a tendency to expand slowly after the concrete has set in which they have been used. This is a matter that builders and architects should see to, otheriwse their completed work will do them anything but credit.—*Australasian.*

"AN INDIAN CINCHONA PLANTATION" forms the subject of four sketches (taken from photographs) in the *Chemist and Druggist* of 31st Jan,, with descriptive letterpress. The plantation is one on the Kannan Dovan hills in Travancore, the first sketch giving a general view of the country; while the second shows a clearing in the forest, with buildings; the third women picking tea growing among the cinchona; and the fourth the drying-house and tea factory.

ACTION OF ALUM ON MICROBES IN PORTABLE WATER.—In the *Chemical News* for October, page 177, there is an interesting reference to the use of alum for the removal of organic matter in suspension and in solution in drinking water. It is well known tha when alum is added to ordinary water it is decomposed, its sulphuric acid combining with the lime and its alumina being thrown down in combination with the organic substances which are present. Along with this percipitate and entangled with it the microbes are also mostly precipitated.

The *Chemical News* states that since this method has been adopted by the French troops in Tonquin they have enjoyed a nearly complete exemption from dysentery. This method was employed in preference to boiling the suspected water, the facilities for doing which were not always at hand.—*Engineering and Building Record.*

MAURITIUS.

(From the *Merchants and Planters Gazette.*)

PORT LOUIS, FEB. 10TH.

THE WEATHER AND THE CROPS.—We have been threatened by two cyclones within the space of twelve days. They have however fortunately both passed at a sufficiently long distance from the island, and have resulted only in refreshing rain of which the coming crops were in much need after the long drought. The fall in the barometer was considerable during the nights of the 5th and 6th instant, but we escaped, notwithstanding some hours of anxiety. We have unfortunately to expect these terrible visitors until the end of next month.

VANILLA.—Transactions have been very limited since the last four weeks. A few small lots of good quality were sold at R15 per kilo. Vanillons at R8 to R9, according to length and quality. We entirely confirm our last valuations as regards the outturn of the crop which will not exceed 14,000 kilos.

ALOE FIBRE.—The market is dull. We have to record the sale of a few small lots fine quality at R225 to R240 per ton. Holders prefer to ship for their account rather than to sell off at the above prices. The following quotations are nominal:—

1st quality	... ...	R250 per ton
2nd "	... ...	R175 "

MINING AND GEMMING IN CEYLON.—We learn that the Syndicate which employed Mr. Barrington Brown and whose local agent is Mr. E. G. Harding, has sent out a mining superintendent in Mr. Bettison who has had large and varied experience, but was never in Ceylon before. Unfortunately, the machinery which was to accompany him in the S. S. "Rewa" was shut out at the last moment owing to dock difficulties, but this will follow in due course. Mr. Bettison starts off tomorrow in company with Mr. Chas. Byrde and perhaps Mr. Harding, to inspect plumbago mines, inland from Bentota in the Pasdun Korale. Of course, his operations will be merely preliminary to see how and where improved pumping and other machinery can be applied to plumbago mines.

ROYAL BOTANIC GARDENS.—We have to acknowledge the receipt from Government of the Report for 1890 of Dr. H. Trimen, F.R.S., Director. Dr. Trimen is usually first in the field and as his Report is one of the most interesting and useful, it is well to have it early. Pending adequate notice and very copious extracts respecting the five Gardens as well as Economic Products, we content ourselves today with three small quotations. First as to the drought in the Anuradhapura Garden:—

It is indeed remarkable how comparatively well some trees stand the drought which would have been expected to fail to do so. Thus the breadfruit ripened last year, and a good plantains of the *kolikuttu* variety were abundant.

Next, as regards growth at the Badulla Garden:—

Some of the young trees of *Cedrela odorata* are already 2 feet in girth at the base and 16½ in. at a yard from the ground. Our chief trouble now is the vast abundiance of white ants, and these are specially destructive in the nurseries.

And finally a paragraph bearing on the discussion referred to by Mr. Barber in his letter today:—

No doubt crossing goes on freely in cacao plantations even between the two main races, and it is well-known here that seed from a single tree gives a very varied progeny; but a very curious remark has been recently made to me by a large grower, who has great opportunities for observation, that the "Forastero" varieties, which he chiefly cultivates, appear to be gradually changing their characters and becoming more like the "Old Ceylon Red," the seeds losing their dark colour on section and becoming pale or nearly white. It will be very interesting to observe whether these observations are confirmed by longer experience.

CASTOR AND COCONUT CAKE AS MANURE.

Discussing the communication that appeared some time back in your columns, as to the relative value of Castor and Coconut cakes as fertilising agents, I see it asserted that the latter is possessed of some constituents that render it as valuable as castor cake. If such be the case, surely an Agriculturist of Mr. Hughes' standing would not have overlooked them, and he would not have recorded, what must be regarded as his deliberate opinion, that taking the white castor cake he analysed as a standard of comparison with 100 as its equivalent, Coconut poonac scores only 53.* Unfortunately, the sample cannot be regarded as a fair one, for the stuff was imported and was also damp. Of course, nitrogen is not the only food plants require, but isn't it the chief food of plants? According to my way of thinking, coconut poonac must be less than half the price of castor cake to make it preferable to the latter as a fertiliser, and to permit of the application of twice the quantity of castor cake per acre.

I saw an extract not long ago in one of the local papers that for fruit-bearing trees there was no treatment that answered better than mulching. I am sorry I cannot lay my hand on the extract to find out whose opinion that was. I thought it would have found a place in the *Tropical Agriculturist* for the current month, but it has not. The value of mulching in agriculture is undoubted, although when in the palmy days of the coffee enterprise some estates were mulched with mana grass, planters were found to condemn the system. Their objection was that the operation drew the roots—the rootlets rather—to the surface, and that the later state of the trees become worse than the first. The same objection was urged by those who have the management of the Horrekelle Estate to the use of fibre dust as a mulching. Though these objections have some force, yet they are not of sufficient weight to counterbalance the advantages of mulching. These are manifold. 1. It prevents the caking of the soil. 2. Keeps it open and porous and permits of its being aerated and cool. 4. Prevents too rapid evaporation, and affords moisture to the roots. Though these are not the only advantages of mulching, yet they are of sufficient importance to remove doubts as to its value. It is well known that roots can take up plant food only by absorption. If there be no moisture in the soil, trees must as a necessity starve. All the food in the soil is not present in a soluble form, indeed only an infinitesimal portion of it is in such a state. The preparation of foods goes on continually by the aid of certain agencies, not the least of which are water and carbonic acid and oxygen. Now, if by the aid of mulching moisture is conserved in the soil, and it is kept open and allows the free passage through it of the oxygen and carbonic acid of the air, not to speak of the large quantities of the latter which will be generated by the decomposition of the mulch, I think it follows that mulching is of great advantage in Agriculture. The decay of the mulch, and in fact of all vegetable matter, forms humus. This is an absorbent, and in its dry state takes up ammonia from the atmosphere and gives it to the soil during rains.

In coconut cultivation we have ready at hand material for mulching round the roots of the trees. Before mulching I think it best for the soil to be broken up round the stem as deep as possible, from about four feet from it to the distance of about 8 or 10 feet. The application of manure before the operation will be a decided advantage. After this the branches as they fall and the weeds as they grow can be applied over the broken ground and the soil never disturbed again. Subsequent manurings can take place one year between the rows of trees, and next in the rows. By this means the shock to the tree by the bereaking of the roots will be minimised.

* Would that proportion stand in reference to all kinds of fruit trees? If the analysis was not made with regard to Coconuts, it would be an advantage to ascertain the percentage of the constituents in Castor and Poonac which the palm chiefly affects.—Ed. "Ex."

Speaking of the breaking of roots reminds me that Mr. John Ferguson, in his lengthy notes of a trip through the Eastern Province, speaks of the desolate appearance of the coconut plantations there owing to the long continued drought. In one instance he mentions that the effects of the drought had been aggravated by breaking the roots of the trees with an elephant plough. Ponder over that ye prophets who recommend ploughings "annual and oftener" of coconut, and ye their disciples. Mind, I do not say "never break up the soil of your coconut plantation," but as experience and observation both point to the operation being attended by severe shock to the trees, "break", I say, as few roots as you possibly can at a time." The same writer observes that, unlike fruit trees in England, coconut trees seem to resent root pruning. Ploughings, "annual and oftener," represent a very severe form of root pruning and of a quite unscientific description. Besides, it must not be forgotten that there is a vast climatic difference between Europe and the Tropics. There, heavy root and branch pruning must be resorted to check growth, and to give a sufficient shock to the tree to induce it to bear fruit. Here, nature does that in the drought we have, and there is never much necessity to supplement her operations. I very much think that one of the reasons for leaf disease taking such a firm hold of our coffee, was the enfeebled condition of the bushes owing to heavy branch and root prunings—manuring having involved the latter operation.

The warning, if not rebuke, of the veteran Editor of the morning sheet to those whose zeal outruns their discretion in recommending the cultivation of myriad products, is well timed. It comes with singular force from him who, when in the vigour of manhood, was closely identified with our great planting industry and took a prominent personal part in the trial cultivation of many minor products. Because a product does well when cultivated over a small area and receives special and unremitting attention, it by no means follows that it will do equally well over large areas. Indian corn with us is essentially a garden cultivation, and does well on the garden plots that surround the cooly lines of up-country plantations, as also on the garden plots of the neighbouring villagers. One knows how well these plots are manured naturally and artificially, and how well cultivated they are. Agriculture, except perhaps in the North of the Island, has not with us reached such a stage as to cause us to expect the same careful treatment of the soil over even moderately large areas as in garden cultivation. In times gone by, and perhaps even now, large quantities of Indian corn were grown in the now historic Walapane villages, and found a ready sale on Estates for feeding horses and poultry. The surplus found its way on the heads of villagers to Nuwara Eliya, a distance of about 15 or 20 miles, and over a road infested with dangerous rogue buffaloes and elephants. The markets were the same for all garden produce, including plantains. This, mind you, by villagers who in recent years have been credited with preferring starvation and death to honest labour.

Like the sea-serpent and the monster gooseberry, certain products are discussed here periodically with all the force and freshness of novel ideas. One of these is the Sunflower. At one time its malaria-absorbing properties are trumpeted forth, and the possibilities of reclaiming malaria-laden regions are discussed. At another, the wonderful properties of its seed-fattening poultry and making them lay. At another, the oil-yielding property of its seed, making it an ornamental, useful and valuable economic product. At the present time, when fuel is jocosely said to be a burning question, the value of the stalks for fuel and its extensive cultivation for this purpose is spoken of. Was there not published in the *Examiner* the results of a rather extensive cultivation of this product by the enterprising Mr. de Soysa at Hanguranketa, a few years back? I cannot find this in the *Tropical Agriculturist*. Sunflower as fuel was discussed years ago. Its use as such, and its being equal to coal as a heat-producing agency, were discovered, like all other great discoveries, in America.—B.—Local "Examiner."

FRUIT GROWING IN INDIA.

A short time ago we drew attention in these columns to the importance, generally, of encouraging the cultivation of fruit trees in this country as an industry, and on the present occasion we propose to deal with it more specifically by entering in greater detail into how it should be done, and the varieties most suitable for a commencement. In the forefront of all Indian fruit trees we will place the Mango; not only on account of its being most generally grown all over the country, but also because it is the one fruit tree in which the Natives of India really take an interest. Those who have not had opportunities of tasting good mangoes, have a notion that this fruit is like so much tow and turpentine. A more erroneous idea never was entertained; it would be as accurate to conclude that the characteristics of the crab apple are those that distinguish all the varieties of the apple in England. Even the fibrous uncultivated mango very often has a most exquisite flavour, but the only way to enjoy it is to do as the Native does and suck it! There are mangoes of all shapes, sizes, colours and varieties and they flourish all over India. Some years ago a scheme was submitted to the Government of the N.-W. Provinces for the establishment of a Mango Society, with the object of studying and tabulating the varieties of this fine fruit; of making coloured drawings of them; of forming an extensive orchard where all the known choice descriptions might be collected, propagated and distributed; and for learning by experiments the best ways of cultivating and improving them from seed. The proposal unfortunately did not meet with the approval of Government, and fell into abeyance. Attempts were then made amongst Native gentlemen to promote the idea, but met with no support. The following instance illustrates the light in which some minds regard philanthropy. A certain collector of choice varieties possessed a rare specimen, for a few grafts of which he was asked for planting in a public garden. His reply was that he could not think of parting with cuttings of his unique specimen as it would at once be propagated and diffused and so become common. His one idea was to jealously guard what he had, instead of permitting his fellow men to participate in its production.

In the "Flora of British India" about 20 distinct species of *mangifera* are described, and it is stated that there are about 30 in all. There is, therefore, a fine field for Horticultural Societies in India for their further development. Bengal, Bombay, Madras and the N.-W. Provinces can produce quite 50 different varieties, all well worth sending to Europe, in place of the wretched specimens from the West Indies now to be found in the London shops. In Madras we have the celebrated Salem and Bangalore Mangoes; in Bombay the "Alphonso," the "Pairee" and the "Fernandina" are grown; whilst in Benares the "Singra," and in Fattegarh the "Takari," are of delicious flavour. In India mangoes are always plucked when still unripe, and allowed to mature in straw. This habit might easily be taken advantage of for export, and large quantities could be transported to Europe in specially prepared cool chambers. Since Australia can successfully send fresh fruits to England, there is no reason why Bombay, which is but half the distance, should not do the same; and the trade once started would certainly prove remunerative enough to cause a large extension of operations to America and Australia. There is, moreover, room for an extensive trade between Northern India and Bombay. A comparison of prices, shows that whilst in the latter place good mangoes at the commencement of the season sell at R16 per dozen and at the height of the season at R8 or 9 per 100, the choicest mangoes of the N.-W. Provinces may be bought at R4 per hundred. The rail journey occupies under 40 hours, and these facts only require to be known to create a trade. It is always difficult to initiate anything in India without Government support, but if Government would but see fit to move in the matter, say, by inaugurating a show to be held in Bombay, there is little doubt but that the idea would rapidly develop. Natives will not be backward in taking up new methods of cultivation if such have been proved to them, by means of experiments carried out in Government gardens, to be profitable. At present their ways of cultivation are crude and barbarous. For instance, the leaves that fall in the autumn and winter from trees in orchards are universally swept away and used as fuel. Now in these leaves there are all the ingredients for the nourishment of the tree, whilst they also prevent the moisture from evaporating too rapidly from the ground. Their own fallen leaves go on nourishing the trees for centuries, and an experiment in Lucknow showed how an almost arid bit of ground was turned into all but a tropical garden almost entirely by the use of surface leafage and irrigation. The leaves were first brought from outside and afterwards the trees themselves provided this surface manure, which kept on increasing every year. Another point in which natives are very careless, is irrigation. They almost invariably give the ground too much of it; probably going on the principle that as they pay no more for a lot they may as well have it. Without proper drainage the soil gets waterlogged and the trees become miserable and perish in a few years.

What we have written regarding the prospects of increased cultivation of the mango applies with equal force to many other hardy and universally grown fruits, such as the plantain, the guava, the orange, the red and white grape and the loquat. These trees will grow on all soils; though for the orange a *kunkur* or gravelly one is preferable. A great benefit to orange growing is shade, and no tree is better suited for this purpose than the "bair." Grapes are best grown in localities where the rainfall is scanty, or where the monsoon is late, and the best variety is a thick skinned one which resists the bursting action of the rains. Guavas may be cultivated to a state of great perfection, and in Etawah a species is grown that is almost entirely free from seeds and of charming flavour. A fruit garden should be laid out somewhat as follows:—A high wall should surround it to keep out jackals and protect the trees from storms. Inside it a row of "Jack" trees should be planted and inside them a row of mulberry trees, and inside them again a row of guava trees. This triple row all round the fruit garden forms an admirable screen for breaking the force of hot winds and storms. If the ground be extensive it should again be divided into squares, and rows by avenues of fruit trees, such as mangoes and li-chis, which are not injured by hot winds. The squares, thus protected, should be planted with plums, apples, lemons, pummeloes, plantains, oranges, etc. All kinds should not be jumbled into one plot, but a separate plot should be devoted to each kind so as to suit the canal irrigation to the wants of that particular kind of tree. There would then, too, be ample space amongst the trees for pine-apple plants, which prefer a certain amount of shade. On these lines a fruit garden should be a great success. Government might be induced to start a public garden on this plan, instead of maintaining the costly establishment it now does for horticultural gardens, mainly for the supply of vegetables and flowers for sale to European residents. —*Madras Times.*

PROLIFIC MANGO TREES.—An article on the cultivation of mangoes in Florida states:—The trees produce on the average from fifteen hundred to two thousand mangoes each, which sell in Southern markets from one to three dollars per hundred.—*Planters' Monthly.*

PERAK TEA.—We learn that a further consignment of Perak tea has come forward by S. S. "Achilles," which arrived in London on the 2nd inst. It consists of a very choice quality, which has been grown on account of the Perak Government. Mr. Koch, the Government inspector, will arrive here shortly and arrange as to its disposal. The inspector maintains that tea of the very finest description can be grown in Perak, as the soil is of such good and rich quality.—*L. and C. Express*, Feb. 13th.

THE STRAWBERRY GUAVA.

A. K. SMILEY, BEFORE THE REDLANDS HORTICULTURAL SOCIETY.

The guava belongs to the genus *Psidium*, a name derived from the word *Psidion*, a pomegranate, and belongs to the order *Myrtaceæ* or Myrtle family. There are at least six different species of guava—most of them belonging to the tropical regions. The guava jelly of commerce is principally obtained from *Psidium Guaiva*—a low-growing tropical tree found in the West Indies, and also raised in the southern part of Florida. There are a number of varieties of it, such as the pear guava, with white yellow pulp, and the apple guava with red pulp. This guava has become a necessity to southern Florida, and is to that region what the peach is to more northern climes. The pear and apple guavas prove hardy in this climate, but the reports are somewhat conflicting. Parties at Pasadena, in Los Angeles county, and Ballena, in San Diego county, report it to be hardy.

There is another species of the guava well suited to our climate—a beautiful, thoroughly hardy, easily raised evergreen shrub, fine for lawn or garden, called the strawberry guava, or in scientific terms, *Psidium Cattleyana*. Some authorities say that Brazil is its native clime. The fruit is globular, about one inch in diameter, borne in clusters of fine claret color, and flavored like a strawberry, hence its common name. The skin has much the consistence of that of the fig, but thinner. The interior is a soft fleshy pulp, purplish red next to the skin, paler towards the middle and white in the centre. It is juicy and in consistence is much like a Strawberry, to which it bears some resemblance in flavor. The foliage is of a rich dark-green color, thick and shining, resembling the Camelia. This shrub is one of most persistent fruit-producing plants in the whole list. One can frequently find on one plant, flower, half ripened and fully ripened fruit.

The Dictionary of Gardening says that the strawberry guava grows from ten to twenty feet in height. It bears fruit when very young. It can be treated as an ornamental shrub, or planted in rows from four to eight feet apart and raised as currants are.—*California Fruit Grower.*

SEASON REPORTS ON GRAIN CROPS IN CEYLON.

From the Abstract of Season Reports, February 1891, published in the *Gazette* of March 6th, we learn that in the Western Province the paddy crop was good or fair, except in the Hapitigam Korale, where it was poor, owing to want of water last September. The dry grain crop was also generally fairly good. In the Central Province, the Matale district was the worst off: for of the paddy crop the report was "poor, worst in Matale North," and of the dry grain crop "very poor." In Walapane too the dry grain crop was reported "poor." In Dumbara the paddy crop was also stated to be mostly a poor one. In the Northern Province the prospects of paddy and dry grain were on the whole good, except in Mannar, where half the paddy crop had failed; and in Vavuniya, where, except in two divisions which had rain, most of the crops must fail. In the Jaffna district tobacco was also extensively cultivated and was looking very promising, also benefited by rain. In the Southern Province the prospects were generally good, except in the Four Gravets and Talpe Pattu of Galle, and the Wellaboda Pattu of Matara, where the drought had affected the paddy; and the Girnwa Pattus, where all the crops were generally bad, owing to want of rain. In the Eastern Province the crops were good or fair. In the Batticaloa district, we are told, "Indian corn and chena products are plentiful and cheap except in Sinhalese villages on borders of Uva, where Indian corn was injured by the drought last year, and fine grain crops destroyed by locusts in January. Coconut crops promise well." In the North-Western Province crops were mostly very light, being affected by the drought. In the Chilaw district the dry grain crops were good; and we read: "Tobacco crop prospects northern division good." In the North-Central Province the maha paddy crop was nil, owing to failure of north-east monsoon rain for the third time; but the dry grain crop was generally fair. We also read: "Village tanks dry except a few in north-east and two in the south. Tank chenas all lost. Drinking water very scarce; some villages have none. Some partial showers fell during the month, which saved about half the growing kurakkan crop, which was dying. Anxiety about deficient food supply relieved. Prospects of yala crop depend on rains in April, May. Heavy rains fell in Tamankaduwa, which will allow of meda crop being cultivated." In the Province of Uva the paddy crops were good; the dry grain crop fairly good; the Indian corn crops everywhere good; and the kurakkan crops just harvested fairly good. In the Province of Sabaragamuwa the crops were good or fair.

THE RAPID OR SLOW ACTION OF MANURES.

We commend to the attention of our planters the remarks recently made by Mr. John Hughes, the well-known Agricultural Chemist, to our London Correspondent, and reported by the latter in his letter by last mail, (see page 660) on the subject of deferred action in the case of certain fertilizing agents.

The special case which has produced these remarks is one on which at the time it was first brought under notice we offered some observations. It may be as well just briefly to recall to the memory of our readers some of the more prominent points connected with that case. Mr. Hughes—whose opinion upon such subjects all will acknowledge to be of the highest value—had, while travelling throughout Italy and Spain, remarked the extremely unpleasant odour pervading many of the olive gardens visited by him in those countries. His inquiry as to the cause of this led to his acquiring the information that the odour was due to the quantity of rotting rags that had been applied with the object of manuring the olive trees. Mr. Hughes saw these, partly buried and in all stages of putrefication, in the gardens he visited, and his olfactory organs made him well realize the fact of the uncleanly habits of the peasants, whose cast-off garments were thus made to do a final and very useful duty. His knowledge of the constituents best adapted for fertilizing special forms of culture made him fully understand the value of this special application; but to that knowledge he added the important further knowledge that much of the value to be attached to the peculiar form of manuring must be due to the very gradual way in which the constituents were yielded up by the slowly decaying rags. It was this second property which induced Mr. Hughes to suggest the application of a manure having a kindred basis, on the widely celebrated Mariawatte estate. We have waited some time to learn what results have followed this application, and have only now done so. We hear that the manure was applied on a patch adjacent to another which had received a dressing of cattle manure, and that the observed result of a single year showed that the latter had had a far more striking effect upon the tea bushes than the former had had.

To those less acquainted with the science of manuring tea—for it is a science of the highest class—than is Mr. Hughes, this fact would have told against the "rotten rag" fertilizer. That

gentleman saw in it, however, a confirmation of his anticipations as to the peculiar value of this new stimulant. It proved to him that the new fertilizer was acting as had been expected by him, that is to say it was acting but slowly, but that while not stimulating to any sudden development, it was parting with its constituents after the manner which he believes to be best suited to the requirements and conditions of our climate. Mr. Hughes has drawn for us a contrast between the needs of home agricultural operations and those of a comparatively equable climate like that of Ceylon. In England, as he points out, the summer, the season for agricultural operations, is limited to a few months. The manures sought for by the British farmers must therefore be rapid in their action, they must yield their constituents to the soil as quickly as possible so that their effect may be achieved in the few brief months available. Here in Ceylon we are possessed of a climate which enables agricultural operations to proceed throughout the entire twelve months. "The more haste the less speed" is a well-known, trite, and often accurate saying, and in the case of manuring in Ceylon it would seem to be of special application. Undue forcing, as we well know, is injurious in many ways to the enduring strength both of animal and vegetable life. Slow development ensures a longer vitality in almost every instance to both forms of life. Mr. Hughes believes that the application of forcing manures to many forms of cultivation is distinctly detrimental, and this has been found to be the case on many of the sewage farms established throughout England with the object of disposal of town drainage. In cases of the kind where super-saturation has occurred, the plants grown, although large in quantity, have become coarse and incapable to a great extent of reproduction. Whether some such underlying principle as this may, as the result of the use of strongly forcing manure, have been in part accountable for a weakening of our coffee trees which have succumbed to leaf-disease we do not feel competent to decide. We know, however, that the point has been asserted by several among those who have endeavoured to account for our past troubles over this matter. Arguing by analogy, we can conceive it to be possible that the free application of highly forcing manures—and especially of those having a mineral basis—may in some degree have operated to weaken the coffee trees when at maturity, and the chance that this may have been so must make it much to be desired that the ultimate course of effect of the slower acting stimulant applied on the Mariawatte estate should be carefully watched and recorded. Animal excrement applied in England has a peculiar value because it parts so readily with its fertilizing constituents and enables the brief summer to be fully availed of. So with bones made soluble as superphosphate. No such characteristic is necessary or desirable in our own case, and we hope that important knowledge may yet be gained and useful conclusions arrived at from the Mariawatte experiment. It seems to be generally recognized that in the case of our new staple as in the case of coffee, we cannot do better than apply castor cake and ground bones in due proportion. If some fish manure is available so much the better. The bones contain some ammonia besides the phosphate of lime, and the castor cake contains all the potash wanted by a soil supplied by that ingredient from the decomposition of felspar and mica. The effect of such an application is expected to last for three years: at least that of the bones and cake, if the ammonia in the fish should be taken up more rapidly.

ARTIFICIAL DRYING OF "COCOA."

(From the "*Trinidad Agricultural Record.*")

Government House, St. Anne's, 8th Jan. 1891.

Sir,—You have doubtless heard of the "man in the street," and do not attach implicit reliance to his statement: I think the same may be said of the "Ceylon man." I may have been wrong in assuming that four-fifths of the cocoa exported from Ceylon was dried artificially. If so I freely admit it. What I wished to call attention to was the statement of the Director of the Royal Botanic Gardens in Ceylon that a hot-air apparatus "*for drying beans in wet weather is regarded as an absolute necessity and is universally employed.*" Whereas we have not half a dozen in this Island and the result is a loss to us of thousands of bags of good cocoa, and the manufacture of thousands of other bags of different stuff which go to reduce the prestige and average of Trinidad cocoa generally.

I now forward to you for publication further correspondence which I have received from Ceylon on this interesting subject and which I hope will be of use to cocoa planters.

The "Ceylon man" may have the benefit of the excessive rainfall stated by me.

The intention of my brochure was perfectly clear, and the general accuracy of my statements has been admitted at Kew and in Ceylon.—Yours, &c., William Robinson.

Queen's House, Colombo, 28th November, 1890.

Sir,—In reply to Your Excellency's letter requesting further particulars with regard to the artificial drying of cocoa in Ceylon, I have the honour to annex a copy of a letter received from the Director of the Royal Botanic Gardens at Peradeniya furnishing information as regards the temperature to be maintained for the process.

2. I have also much pleasure in sending you a copy of a Report by the Director of Public Works on my request to him for a model of the Fan and a rough drawing of the arrangement of the stove and air passages.—I have, &c., A. E. Havelock, Governor.

His Excellency the Governor of Trinidad and Tobago.

Royal Botanic Garden, Peradeniya, 13th Nov. 1890.

Sir,—In reply to your letter of 3rd November, I have the honour to inform you that I have made inquiry of several leading growers of cacao as to the point referred to by Sir W. Robinson, and now forward the result for His Excellency's information.

1. No definite temperature is maintained in the house during the process of drying. The object aimed at is to get the room as hot as possible with a good strong current of air passing through. This is practically limited by the comfort of the coolies employed in it. In the small drying house described in my former letter the thermometer is marked at 110° F., and the coolies are instructed not to allow it ever to fall lower. One or two men have to be always inside turning over the cacao, and occasionally moving the trays from the hotter to the cooler end of the house. This is very necessary when there is much wet cacao in the house, as the damp gets down forward by the current and is apt to sweat rather than dry the cacao at the end next the exit of the air. One planter tells me that he has known the temperature in his house as high as 170° F., but there is a general consensus of opinion that 120°-140° is the highest that is required.

2. The main point is to keep the fans going. In the small drying house described this is effected by hand-power; but it is of course much more efficiently done by steam or water-power. Jackson's tea-drier has been found a perfect cacao drier, and the American fruit-drier has also been used here with success.—I am, &c.,

Henry Trimen, Director.

Hon. the Colonial Secretary, Colombo.

(*Copy of Report referred to.*)

Sir,—I annex copies of letters from Messrs. John Walker & Company, Messrs. W. H. Davies & Co. and Mr. H. J. Vollar of Pallekelly on the subject.

From these it would appear that no special fan or stove is in general use in Ceylon, any ordinary stove and an air propeller to cause a draft of hot air through the room being all that is necessary. * * *—ROBERT MACBRIDE, Director of Public Works.

The Hon. the Colonial Secretary, Colombo.

From *John Walker & Co. to R. D. Ormsby, Esq.* 19th Nov. 1890.

Sir,—We are sorry we have no fans or stoves in stock. What was used is a Clerihew stove with exhaust fan. We have not made any for some years. —DAVID PAGE, Manager.

From *W. H. Davies & Co. to R. D. Ormsby, Esq.* Colombo, 19th Nov. 1890.

Dear Sir,—Referring to your letter of date, if an ordinary stove is erected at one end of a room and a propeller at the other to draw the warm air through the tats on which the cocoa is spread, you will find this all that is necessary. Propellers can be had from any size 12 deg. to 60 deg. diameter. * * *—Yours, &c., W. H. DAVIES & CO.

From *Mr. H. J. Vollar to Robert Macbride, Esq.* Pallekelly, Kandy, 19th Nov. 1890.

Sir,—In reply to yours of 15th I would have no objections to any sketches being made of the fans used for drying cocoa. If it is only the fans, however, that are required, it would be unnecessary for you to send any one to sketch them, as Blackman's air propeller is found the most suitable, and one of them should, I think, be easily found in Colombo. * * * —H. J. VOLLAR.

NOTES ON PRODUCE AND FINANCE.

INDIAN AND CEYLON TEA IN RUSSIA.—We understand that the Russian merchants who, only a few months since, so strongly protested against the introduction of Indian and Ceylon tea into Russia are beginning to see the error of their ways, and that since the opening of the magazine for the sale of tea by the Ceylon representative, the prospects for the sale of Indian and Ceylon teas have decidedly improved.

A HIGHER STANDARD.—A correspondent of the *Grocer*, moved by reading an account of the high price realised at the recent sale of the parcel of fine tea, says:—"As an old grocer I cannot but think that the present feeling should prompt the trade at once to graduate their prices and aim at a higher standard of tea altogether; the time and occasion are most opportune, and should be utilised uniformly and universally. The grocer has now a chance of retrieving his long-lost dignity as a tea vendor. Grocers' associations and co-operative societies can do much to counteract the vile stuff as sold by reckless adventurers. Why should tea (the greatest socialising beverage) be made the target of unscrupulous traders?" Echo answers why? and the answer is because a large number of people in the tea trade, having no scruples in particular, and being utterly indifferent to all standards but that of the largest profit, sell whatever they can find a market for.

THE PRODUCE CLEARING HOUSE.—Although the facilities for speculative dealing in produce afforded by the Produce Clearing House are not likely to find favour with the steady-going Mincing Lane stagers of the old school, the Clearing House is evidently a well-conducted establishment. In his speech at the fourth ordinary general meeting of the Company, the Chairman said that the members felt that their system was a necessity under the new condition of trade, and, time being on their side, their future might be considered as beyond all doubt. Their engagements during the past year had amounted to £36,500,000, and in fulfilling these engagement they had not made a single bad debt, nor had they had a single dispute with any of their customers to refer to arbitration.—*H. & C. Mail*, Feb. 20.

DR. VOELCKER's full Report on his deputation to India will be published in England and sent out to the Government of India. He left however, an abstract of it with the Government before his departure, and this, together with the recommendations of the Agricultural Conference held at Simla in October last, are now before the Provincial Governments for their consideration.—*M. Mail.*

A WYNAAD PLANTER writes:—"We, the few North Wynaad planters, look forward with hope and say verily the bumper is bound to come next year, not of fever mixture but of coffee. We had a heavy shower last week, which has pushed out a fine show of spike. Coffee is R350 per candy. of 660 lb. The pepper crop has been had, very had; but the price is going up."—*Madras Mail*, March 2.

CHINA TEA TO BE BLOTTED OUT OR REVIVED.—The Foochow *Daily Echo* is terribly exercised about the gloomy prospect before China tea and winds up an editorial on the subject as follows:—

If the stern fact of thousands of Chinese who are entirely dependent upon the trade for very existence, being out of employment, and if reports be true, verging upon the brink of starvation and the yearly and serious decrease in the lekin and Export duties levied upon Tea, are powerless to appeal to the hearts, or the pockets, of the Imperial Officials; it is beyond our power to hazard a remote guess as to what *can* be done, though any body of merchants might advance an army of feasible propositions. At present, the barriers between the introduction of improved methods of growth, cultivation, and manufacture, are impenetrable. No foreigner can acquire land for the culture of the plants under improved methods, nor is there any protection for the investment of capital or introduction of machinery, under European auspices. While even the more intelligent and progressive among Chinese merchants, are themselves afraid to lend their aid toward the desirable end;—standing as they do in dread of the populace, and possibly also of their own officials.

If however, it could be conceived possible, that protection should be accorded them, and machinery such as used in the manipulation of Indian leaf, was allowed to be set up in the various Tea districts,—and provided the same degree of care and attention was bestowed upon the leaf as upon Indian gardens,—or even the plants were allowed to be grown, and the leaf manufactured under experienced supervision, (not necessarily foreign by any means but upon the lines proved by experience to produce better results); then, it is our opinion, that Ceylon and India would find a very powerful and popular rival in the Teas, which we know from experience of long years ago, can be produced in the mountainous districts around us. We submit—that while it is desirable that encouragement, and protection, should be granted to Europeans desirous to acquire land in the interior, it would be a wise measure, on the part of the Chinese Government to first assure such protection to their own people. Also, as far as is consistent with justice, they should insist upon the Tea growers taking more care of their plants, by pruning and weeding, while every encouragement should be afforded to such as desire to adapt their methods of manufacture to the requirements of the age, and produce Teas more in accord with the public taste. Not on European markets alone but in Australia, America, and Canada, the taste for Indian and Ceylon Teas is rapidly increasing, and such once deeply rooted in the public mind, will be extremely difficult to eradicate. Any measures to be taken to revive the taste for, and improve the quality of, China Congou, should be set in motion at once, and before its traditional merits are a matter of history. It is held by some that the panacea for the evil lies in the entire removal, or at any rate modification of the export duties, but we consider that the first and most important question is rather the improvement of quality, to which end strenuous efforts should be made.

THE CEYLON SPINNING AND WEAVING COMPANY, LD.

It has been a subject of considerable surprise to us that in view of the very satisfactory Report given by the Directors at the recent shareholders' meeting, the credit of this Company should be rated so low as it is in our local shares market. The explanation given to us of R100 paid-up shares being quoted at R80 or less, is that the Chetty shareholders are sometimes very impatient of any delay in getting a return on their money. They are accustomed to turn over their capital very quickly in their rice and cotton goods' ventures and do not at all like to have any portion locked up for a long interval. If this be the fact, it is evident that Chetty capitalists are scarcely the society from whom support for Limited Companies can be sought; for there must, even with the most promising, if not successful, Company, always be a preliminary interval to allow of the needful testing and earnings before dividends can be declared. We have been anxious to get the opinion of an outside authority on the Report and balance-sheet af the Company, and have been successful in inducing a gentleman of experionce in no way connected with the Company, to put his pen to paper. The following then is the opinion of an impartial and experienced observer of tho Report and work done by the Company's mills as recorded at the recent meeting of shareholders:—

"I have no practical acquaintance with cotton mills in the East; and sinco my day everything at Home has undergone a complete change. Still as you ask me for my candid opinion of the prospects of the Colombo Mills just opened only, I have no hesitation in stating that it is an exceedingly favourable one. The Report and statement of accounts appear to me to be both straightforward and satisfactory; and I have no doubt that ere many years are passed the Company's operations will be on a far more extended scale than they are at present. The climate is everything to a spinning concern. It must be about twelve years ago I pointed out this great advantage of climate possessed by Colombo over India, and I was then urged to interview the late Messrs. De Soysa, Jusey de Silva and other wealthy and influential Sinhalese and endeavour to get a mill started on the lines of those at Madras. My idea then was to locate the mill near to Cotta, where a working population at very cheap rates could, I thought, be counted upon to a certainty. But the mill now erected has secured a better locality, for it has the advantages of both canal and rail, tho former *at its very doors* and the latter nearly so. There have also been in the interval of twolve years extensive improvements in engines and boilers and spinning and weaving machinery generally. The Colombo mill has been able to avail itself of *all* these, and is therefore better off in this respect than the majority of Indian mills, the bulk of which, however, are nevertheless doing a profitable business, weighted though they are with heavy commissions, &c. The opening up of Colombo into a great port with steam communication constantly available to all parts of the world is also another great advantage, for the mill, in its operations, is not limited to simply a local demand, very often more than over-supplied, owing to keen competition by the production of Lancashire factories.

"The dyeing department ought to be a profitable ono now-a-days, thanks to the splendid colors now shipped at cheap rates from Germany and the very simple manner in which they can be used, even after only a lesson or two, by natives without European supervision. In time, no doubt, a largo business will be done in cleansing and redyeing articles of apparel generally; collecting agencies on the Perth (Scotland) principle being distributed over the lines of island railways if not even established at some of the adjacent Indian ports. To emphasize what I say on this head, look up Indian Customs House return and give the figures for values of Dyestuffs imported from Europe during past five years—the increase is astounding I believe. In Bombay the trade has developed enormously—why not in Ceylon?"

In accordance with the request of our correspondent, we append the figures for comparative imports of dyes for nine months of each of the past three years, namely,—

Dyeing and Tanning Materials.
Nine Months, 1st April to 31st December.

	1888.	1889.	1890.
	ozs.	ozs.	ozs.
Aniline and alizarine dyes	28,870,422	37,700,630	45,493,396
	cwt.	cwt.	cwt.
Cochineal ...	1,461	1,499	2,040
Cutch	4	14	8
Gambier	12,903	12,609	15,308
Madder or manjit...	4,618	1,932	3,409
Saffron	160	138	190
Other sorts ...	15,690	19,114	12,474
	VALUE.		
	R.	R.	R.
Aniline and alizarine dyes	16,12,876	24,25,256	26,54,017
Cochineal ...	1,30,831	1,28,960	1,68,091
Cutch	63	179	158
Gambier	2,87,894	3,38,821	3,60,483
Madder or manjit...	55,753	21,830	37,409
Saffron	3,29,615	3,02,267	3,81,996
Other sorts ...	1,70,841	2,31,371	1,68,686
Total ...	25,87,873	34,48,684	37,70,840

Later on, our correspondent wrote as follows:—

"Cotton Factory.—I forgot when writing to you to include as a favourable feature the tendency of silver to fall to a low point again. The lower that exchange falls the better it will be for the factory for exchange on the cost of manufacturing in Lancashire and on the freight of the goods shipped to the East must, of course, be recovered from the purchasers here. The price of the raw cotton on the spot is scarcely a factor, for a low exchange causes prices to rise equally against those who buy cotton to export and those who buy cotton to manufacture locally."

SALES OF COCONUT ESTATES.

It is satisfactory to find a veteran like Mr. Charles Byrde* going in for fresh plantation property. He has just sold out of Elston in the Kelani Valley for £4,500 and invested part of his money in coconut properties close to Ambalangoda which—bought at R20,000—ought to pay well with a railway at their gate, to carry the produce to Colombo. We wish Mr. and Mrs. Byrde all success. A contemporary records the sale as follows:—

We learn that Sinnagoda and Bellevue estates at Ambalangoda, belonging to the Eastern Produce and Estates Company Limited, have been purchased by Mr. Charles Byrde for R20,000 cash. The estates are 290 acres in extent, of which 199 acres are fully planted with coconuts, 33 acres with cinnamon, while 58 acres aro paddy fields and waste land. The estate will be $1\frac{1}{2}$ miles from the proposed railway station.

COFFEE, TEA, COCOA, &c.

Colombo Commercial Company, Limited.

Report presented to the Sixteenth Ordinary General Meeting of the Company, on Monday, the 23rd day of Feb. 1891, at 12-30 o'clock p.m.

The Dirctors are now able to place the following

* His brother, Mr. F. W. Byrde, turns out to be the purchaser,—Ed. *T. A.*

annual accounts before shareholders, viz:—

Profit and loss account for the year ending 30th September 1890. Balance Sheet made to 30th September 1890.

	£	s.	d.
It will be seen from these accounts that the result of the year's operations is a profit of...	£3,281	11	9
A balance was brought forward from last year of	128	8	9
Making a total at the credit of Profit and Loss of	£3,410	0	6

	£	s.	d.
The Directors propose to apportion this sum as follows:—			
To the payment in full of the Dividend on the 6 per cent. Preference Shares for the year ending 30th September, 1890	£1,089	0	
To the payment of a Dividend of 3 per cent on the Ordinary Shares for the same period	2,100	0	0
To be carried forward to next account	221	0	
	£3,410	0	6

The General Trading business of the Company has shown an increase during the year, and with careful management the Directors look forward to its steady development. Owing to the rise in the price of Silver, the result from the working of the Company's Estates during the past year was not so satisfactory as anticipated. Silver having now fallen in value, and the market for Ceylon Tea being favorable, the current year's working of the Estates is expected to show a marked improvement. During the past year the area under tea on the Company's Estates has been somewhat increased, and it is the intention of the Board to gradually extend this cultivation as opportunity arises and labour admits. The Coffee Market is very good, and of the small area under coffee still left on the Company's Estates a few fields are producing fair crops but the future of this product in Ceylon is very uncertain, and the Directors do not, therefore, rely on the returns to be derived from it. Mr. John Brown, Chairman of the Board, left for Ceylon in November, and will inspect the properties in which the Company is interested.

Balance Sheet, 30th Sept. 1890.

Dr.

	£	s.	d.	£	s.	d.
Capital authorised:—						
10,000 Ordinary Shares of £10 each ...	100,000	0	0			
20,'00 6°/o Preference Shares of £5 each ..	100,000	0				
	£200,000	0	0			
To capital issued—						
10,000 Ordinary Shares, £7 paid..	70,000	0	0			
3,630 Preference Shares, £5 paid.. ...	18,150	0	0	88,150	0	0
To Debentures... ...				10,100	0	0
Do Bills Payable ...				11,100	0	0
Do Loans, Ceylon ...				2,500	0	0
Do Loans, London ...				3,500	0	0
Do Sundry creditors, Ceylon				3,942	6	0
Do Sundry do London...				5,933	3	6
Do Profit & Loss Balance...				3,410	0	6
				£128 635	10	

Cr.

	£	s.	d.	£	s.	d.
By Colombo Establishment—						
Freehold Premises, Buildings, Machinery, &c...	20,000	0	0			
Do Estates	70,000	0	0			
As per last Account... ...				90,000	0	0
Do Machinery &c., as per last Account				2,408	4	1
Do Advances against Crops... ...				17,282	12	6
Do Sundry Debtors, Ceylon... ...				15,476	2	3
Do Stock of Bones, Stores &c., in Ceylon				12,176	16	10
Do Cash at Bankers and in hand, Ceylon				936	5	3
				138,280	0	11
Less Exchange				21,129	4	11
				117,150	16	0
Do Bills Receivable				1,550	0	0
Do Sundry Debtors, London.. ..				1,485	6	0
Do Produce in London and afloat				4,029	9	9
Do Office Furniture, London ...				150	0	0
Do Cash at Bankers, London..	4,255	9	9			
Do Cash in hand, London...	14	8	6			
				4,269	18	3
				£128,635	10	0

Profit and Loss Account for Year Ending 30th September, 1890.

Dr.

	£	s.	d.
To Salaries and Office Expenses, Colombo	2,309	2	3
Do Rent, Salaries, and Office Expensee, London	351	14	6
Do Director's Fees... ... ...,	400	0	0
Do Audit Fee	26	5	0
Do Income Tax	51	9	0
Do Interest on Debentures	612	0	0
Do Balance carried down—Profit ...	3,281	11	9
	£7,032	2	9
To Balance carried to Balance Sheet ...	3,410	0	6
	£3,410	0	6

Cr

	£	s.	d.	£	s.	d.
By Profit on Curing, Milling, and General Trading Account				7,032	2	9
By Balance brought down—Profit 1889-90				3,281	11	9
Do Balance from last account.. ...	2,617	8	9			
Less Dividend paid February, 1890 ...	2,489	0	0			
				128	8	9
				£3,410	0	6

A MOST CELEBRATED TEA MARK.

How are the mighty fallen, &c. What is described as an unique opportunity, and a magnificent chance for tea-dealers and grocers, is the sale of the mark T. B., in a diamond in white on a black ground. The handbill announcing the sale states that the Mark has been the leading importing Mark for over thirty years, and is the most celebrated tea Mark in the world, and, if properly advertised, it should at once take up the position of leading retail Mark. We might suggest that a firm which has been so eminent and regular in its sales of tea at the Rooms, now that there are no more chests or half-chests to be sold without reserve, might be true to their old policy, and put up the Mark for sale at the same place, "Fog or no Fog." It would be a novelty, at all events, and enterprising dealers might come and make their bids.—*L. and C. Express*, Feb. 20.

"CEYLON AND IRRIGATION."

is the heading of a further letter by Mr. Alfred Deakin (the probable future Premier of Victoria) in the Melbourne *Age* received by today's mail. This contribution is so full of local colouring and interest that we reproduce it in full. Mr. Deakin, it must be confessed, writes with more accuracy and insight than we could have expected from his short visit to the island. Of course, there are some slips in his letter, but none very glaring, unless it be the statement that the import duty on rice does not affect the scale of wages paid by the planters. That dear or taxed food has a corresponding effect on wages is acknowledged all the world over, nor is Ceylon an exception; for certainly the abolition of our Customs levy would lessen the cost of Indian rice to coolies and planters, and either the former would have to take less wages per day, or the latter would pocket the difference in the cheaper rice which they purchased and supplied to their coolies. Then again, Mr. Deakin heard nothing in Ceylon apparently of the grant-in-aid system through which the Ceylon planters pay in direct contribution half the cost of their district roads. Still more our Australian critic ignores the point of our general revenue being largely benefited through railway profits, these therefore constituting undoubtedly an indirect medium of taxation. Of course, the tea, coffee, cinchona and cacao plantations contribute the vast bulk of railway receipts through rice, machinery, manure and general goods carried up and produce down. If there were a general "land tax," which Mr. Deakin, like everybody else, would consider tho proper and scientific mode of raising the larger proportion of the general revenue in Ceylon, undoubtedly railway rates would have to be adapted until no more than working expenses and interest with sinking fund contribution for debt, were provided. But as we personally pointed out to Mr. Deakin, could there be a better or fairer way of dealing with plantations than by a tax which is strictly proportioned to the quantity of crop gathered and despatched, the requirements in rice, &c. being nearly always in proportion to the outturn of produce. Considering the time of Mr. Deakin's visit, it is not unnatural that he should come to the conclusion that "Irrigation" was the one great subject of political and administrative discussion before the Government and public of Ceylon; but had he remained a little time longer, he would have seen how mistaken was this view, seeing that no reference whatever was made to it in the annual Reports of either the Planters' Association or Chamber of Commerce of the Colony. Mr. Deakin as a democratic, practical politician, is keen enough to see the futility of discussing such a one-sided unjustifiable proposal as the abolition of one rice-tax without the other, and he appears to favour a scheme which has for its basis the recommendations of the recent Select-Committee on the subject. To this we take no objection—indeed it is the policy we have all along urged as the best adapted to the case of Ceylon at present and for twenty years to come. Certainly, it is the arrangement which is best calculated to save the native agricultural classes in the island from a change which they would have reason to regret far more than their experience of the present system of taxation so far as it affects them.

CEYLON AND IRRIGATION.

BY ALFRED DEAKIN.

Those by whom Ceylon has been considered a Crown colony of Oriental stagnation, where a despotic but indifferent Governor presides on the one hand ovor a handful of effete Europeans enervated by the climate, and upon the other hand over a great body of natives hostile to every form of change, both classes being entirely excluded from participation in the Government of the country in which they live, are cherishing an unpardonable delusion. The natives, it is true, have multiplied rather than advanced, the planters have had a keen eye to their own interest rather than to that of the colored races, and one or two of the Governors have spent their terms of office in mere routine; nevertheless, these have not been the most prominent circumstances in its recent history. The representatives of the Queen have for the most part striven hard to do their duty, and as a rule they have been supported by their white and appreciated by their brown subjects. The industrial vicissitudes which have here succeeded each other with rapidity have only developed among the planters a courage and an energy which reflect honor upon them. Through times of prosperity and times of depression the Government has pursued its way, and undauntedly coped with each crisis as it has occurred. From one motive or another the leading natives have joined to some extent in the forward movement, from which they have incidentally benefited. In spite, therefore, of a few palpable blunders and some intervals of paralysis, the island has been steadily progressive and has evolved by degree a progressive policy worthy of the examination of self-governing colonies.

The population of Ceylon has more than trebled under British rule, and its production has several times trebled. Its revenue from all sources, including railways and water supply, amounts to £1,500,000, two-thirds of which is received for services rendered, and only one-third of which is raised by taxation. Optimists claim that neither race of the inhabitants have suffered from this burden, and that if the Secretary of State for the Colonies assents to a proposal now before him for a further reduction of the grain exciso neither race will know that it is taxed at all. There appears to be some ground for this contention. Certainly the indebtedness of the colony is insignificant, since it requires to pay interest upon only £2,300,000, while its railways, upon which £4,600,000 has been spent, pay interest, have repaid a considerable portion of their original cost, and would now sell for much more than the total of tho colony's obligations. Financially, therefore, the position of Ceylon is strong and its future hopeful. As a rule its soils are less rich than those cultivated for the same products in India, but constant moisture and constant heat give its climate the effect of a forcing house and render production equable as well as large. The cost of irrigation and the rent of land to the Government are less than the average in the peninsula. In brief, while every prospect pleases as much as in the days of Bishop Heber the more humane conclusion has been arrived at that man is not viler here than elsewhere, and this has been coupled with the further conviction that his labor can be made very profitable to himself and to the empire.

At first sight it may appear remarkable that Ceylon should have required an irrigation policy at all, and still more that it should have come to occupy the most prominent place in its politics. The staple products such as those from the coconut, which with tea, coffee, cocoa and spices furnish the wealth and export of Ceylon, are none of them irrigated, and most of them are grown in regions which enjoy an ample rainfall,

The whole of the crops which the planter raises and Enrope purchases are obtained in profusion without artificial watering, and the direct interest therefore which Englishmen or an English Government can have in irrigation is absolutely *nil.*

There is but one product that receives irrigation in Ceylon, and that is rice, a feod which can be obtained from Bengal and Burmah, where the yield is much greater than in Ceylon, at a cheaper rate. It is produced and consumed by natives only, since the reqnirements of the small white population could he more than satisfied by a single shipment in a year. To buy in the cheapest market must always mean to buy imported rice. According to all principlos of political economy acknowledged in Great Britain, and also according to the selfish interests of the ruling class, which are certainly as livoly in Ceylon as in other parts of the globe, any sanction of the growing of rice in the island should be forbidden, while the expenditure of public money upon works for its encouragement should he stigmatisod as utterly indefensible.

The British Government of this tropic colony, however, appears to have set itself the task in this one connection of traversing every accepted university doctrine. It has fostored the growing of rice both by legislative aud executive action; has spont public money liberally to encourage and extend the cultivation; and has crowned its edifice of economical heresy hy the imposition of an import duty with a protective incidence upon imported rice. That nothing might be wanting which could add to the enormity of its offences and constitnte its action the unpardonable fiscal sin it has placed this protective duty and a smaller excise to hoot upon what is and always has been the chief food of its people. To seek to benefit them by taxing the one grain upon which they live, and to procure which they require to devote almost the whole of their labour and their small carnings, is surely a phenomenon that calls for comment from all sorts and conditions of critics. Yet, in the island the principles of this policy are cordially approved, hecause they are held to he justified by its circumstances and also by results. The policy has not been accepted in silence, though the challenge which it has provoked relates only to the extent of its application. The challenge fortunately puts us in possession of the reasons why the island has dared to strike out for itself a practice suited to its own conditions and people, notwithstanding its conflict with the mathematical axioms of economics, which take acconnt of none of these things.

The first justification offered is truly Oriental. Rice always has been taxed, and to replace the existing imposts by any other, no matter how equitable, would be to create endless discord and disaffection. Hamlet's principle of proferring the ills he had to possibilities of which he was uncertain lies at the very root of the conduct of public and private affairs in Asia, but doss not affect the merits of the case.

The second justification for the Government's interference is that though a large part of the revenue derived from taxation is obtained from rice, the grower at all events gets his contribution returned to him. There is an excise on rice grown on the island, which yields nearly £100,000 a year. The argument is that as the natives grow and eat the rice which is so profitable to the State, they are entitled to receive hack again a proportion of this profit in the shape of grants. Accordingly, under the law, one-fourth of the receipts from excise is set apart each year for what may be termed the ordinary outlay upon irrigation schemes. In addition to this, about another fourth is voted annually for special works, so that one half the excise is held to be repaid in this way. The proposal now before Lord Knutsford provides for a further commutation of the excise which, if approved, will reduce the net receipts of the State by yet a third fourth of the present receipts, while it is argued that the last fourth, which would be retained permanently, is only fair payment to the Crown for general purposes and all the indirect expenditure incurred in connection with the management of the irrigating works. The weak point in this calculation is that while all rice growers are taxed, only those who receive the benefit of this Government expenditure have had any return, and these are but a small proportion of the whole body, most of whom receive their water supply from schemes constructed long before the advent of Europeans. In the past no balance of this kind has been kept. From 1884 to 1887 the grain tax yielded £409,000 while the total expenditure npon irrigation works and their maintenance was £168,000.

In reply to snch a calculation it is impossible of course, to say that a large portion of the grain receipts are rent for land held from the State directly, and not a tax; but this at hest is an imperfect adjustment, and merely relates to that proportion of the excise raised in excess of the sum levied upon pirvate proprietors of land. It would be necessary to prove that it was equivalent to other Government rents in order to give this view much weight. Another contention is, that the natives get the benefit of the import duty, which is to the excise as 10 per cent is to 7½ per cent, and that, therefore, they are 2½ per cent the gainers. The free trader would probably urge that this is unjust to the consumers, who are chiefly natives. While a protectionist would reckon the margin too small to be of any permanent value and urge the abolition of the excise altogether.

The fact cannot be disguised that out of less than £500,000 of taxation rice alone pays nearly £300,000, an excise of £100,000 and an import duty of £200,000. As hurdens should be distributed in proportion to wealth this is too large a share. The planters contend that as they are the employers of native labour thoy pay their share of the rice tax in increased wages, but it is doubtful if these are appreciably affected by either the rise or fall of rice. The 6½ per cent on general imports and a small export duty to cover the expenses of medical supervision of their laborers are all their contributions to the State, in all little more than £150,000 a year, which is not an excessive amount certainly on a capital of nearly £8,000,000. Figures snch as these assuredly strengthen the case for a generous outlay upon water supply for the use of the natives.

Further justification—and perhaps it would not be too much to say the real justification—is to be found in the fact that, although the island is exceptionally rich in the coconut, bread and other fruits, as well as in vegetables and yams, which the Sinhalese use, yet rice is their chief food. It produces, at all events, in many parts of the country, the best result for the least labor. Its cultivation has been pursued from immemorial antiquity, and is better understood than any other. The British Ruler has been compelled to adapt his views to the character of his native subjects. Rice growing is an honorable pursuit among the Sinhalese, and they would probably refuse to attempt the raising of any substitute. When they obtain little rice they suffer from prarega, a malarious fever analagous to that known in Italy; when they get none they sometimes die of starvation, and thus to preserve health and life to them rice culture is rendered a necessity. When, in addition, it is remembered that the Government derives so large a revenue from this source there need be no surprise if the industry is fostered to the utmost possible extent, and that the whole weight of the Administration is cast in its favour.

Irrigation has been the chief article in the programmes of successive Governors, and their provincial officers have pushed it enthusiastically. There are six honorary titles in the gift of the Crown which are much prized among native notabilities, and by their means it is said that irrigation enterprise is rewarded and schemes are encouraged. The planters are inclined to complain that the paternal solicitude of the State is devoted too much to this one branch of industry, but taking all things into consideration it is hard to see how it could be otherwise. Other products might be encouraged, it is true, but rice is likely to remain first in the needs and tastes of the people.

The natural difficulties in the way of the cultivation of rice are naturally made much of by the

opponents of irrigation, and even its advocates are unable to ignore their seriousness. It is a thirsty erop, and the provision of a sufficient supply of water by means of storage is thereforo most expensive in proportion to the area affected. Then again the rich deltaic soils of the Ganges and the Brahmaputra, with their annual floods richly laden with silt, secure orops which are 50 fold to 80 fold of the seed sown. There is much argument as to what may be oonsidered a fair return in Oeylon, and as rice is grown almost everywhere, there are, as is natural, very different returns. In some districts it s insisted that the harvest gives only 4 or 5 fold, while the average claimed is not more than 15 to 18 fold. It is confessed, therefore, that the island is heavily handicapped in this regard, and cannot competo with the mainland. In 1888-89 India exported nearly 7,000,000 cwt., while Ceylon imported 3,330,000 cwt. Sometimes it has been questioned whether rice growing does not involve an absolute loss to the Sinhalese farmer, and very careful estimates of his working oxpenses and profits have been made. The resnlt appears to show that in certain districts which are well irrigated, such as Matara and Batticaloa, it pays well, but that in others it yields only a bare profit. The doubt has arisen whether the limit of its payable produotion has not been reached, and certainly, the fact that some 6,000,000 bushels annually have been bought from India during the past few years would seem to lead to such a conclusion. On the other hand, Mr. Elliott, the Government Agent at Batticaloa has conducted some careful experiments in rice growing by means of hired labor in two districts with which he is intimately acquainted, and gives a balance sheet which shows a profit of 40 per cent. in the one instance, and 70 per cent. in the other. If such profits are open to the average cultivator, as many believe, there is still a fine future before the Sinhalese and Tamils of the low country, and the Government policy is abundantly justified.

The Hon. Mr. Grinlinton, M. L. C., has propounded a scheme which would do much to remove the admitted irregularities in the incidence of the grain tax by adjusting it exactly to local conditions. He proposes that all rice fields yielding less than 4 fold should be exempt from the tax; that those yielding from 5 to 7 fold should pay 5 per cent. on their grain returns; from 7 to 10 fold, 7½ per cent.; and above 10 fold, 10 percent. If coupled with a liberal irrigation policy snch at lan appears to possess much to recommend it. All thre can be asked is justice. The alternative would be to iomit the taxation and stop expenditure npon irrigatsn altogether. So far no one has ventured to make uch a proposition. Were the import duty allowed to remain. it would then become distinctly protective in its incidence.

There is one tax which already falls npon both races alike, though it ignores all differeuces in wealth and power of wage earning. It is a capitation tax payable either in labor or cash, giving the option to each citizen of manual work upon some public work for a fixed period in each year, or of paying what is considered the native equivalent, 3s. a week in town or 4s. in the country. The Europeans and well-to-do natives pay this trifling sum, while the less fortnnate bulk of the colored people prefer to work. Of course the sacrifice they make in this way is relatively vastly greater than that demanded of tho whites, and this may be urged as a further point in their favor.

The magnitude of tho rice interest, and therefore of irrigation, must continue to force its circumstances upon public attention. The Government returns give 574,000 acres as now under this crop, while those of the Messrs. Fergusou aro 700,000, and their anticipation is that the total will soon reach 1,000,000 acres. The State already exempts from taxatiou for four years land that is being brought under the plough for the first time; by its system of commutation does much to reduce its demands, upon the cultivators, and by allowing them to make their contribution to irrigation schomes in labor, instead iu coin has fostered a feoling of community of intorest betwecn them and the Administratiou. Apparently therefore, thero is not a great deal to be done and this may be done without mnch difficulty, to convince the Sinhalese and their fellow natives of the absolute equity of the Government under which they live, and of the sincere desire of the whites for their prosperity and progress. To that desire is due the, at first sight, surprising fact that Ceylon is an irrigating country. The publio welfare has been held to be tho supreme law and that welfare has demanded the adoption of a bold irrigation policy.—Melbourne *Age*.

MINING AND GEMMING.

A new departure has been taken by the London Syndicate to which Mr. Barrington Brown reported, in sending out a practical mining agent, Mr. Bettison, of much and varied experience. His attention so far is confined to plumbago and he has been visiting some of the native mines, with reference to their working and the application of machinery. But we confess we rather regret to see this Syndicate going to work after what is a "one-horse" style. We had hoped to see Mr. Barrington Brown himself back at the head of an adequate staff and requisite machinery to give both our gemming and mining an adequate trial sufficient to satisfy everybody with good success or the reverse.

OUR BOTANICAL AND ECONOMIC GARDENS.

The publication of the annual Report of Dr. Trimen and his capable Assistants constitutes an interesting event of the week. We issue all the material portion as a *Supplement* and elswhere review the same. We should like to see more power given to Dr. Trimen to be able to follow up his distribution of seed—of cacao, for instance—with enquiry and inspection to see what was done with it. We require in Ceylon indeed, a far closer relationship and united form of working in respect of the several departments bearing on the promotion of native and State Agriculture:—Revenue-provincial, Forestry, Educational-Agricultural and our Botanic-Economic Gardens in which most of the science is centred. There can be no doubt that if a properly representative "Agricultural Board" existed—such as we have advocated for many years back—a great deal of frittering away of public money and loss of time would be saved, mistakes would not so often occur, and much more good would be done in benefiting the native agricultural community and in developing the resources of the country.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Feb. 19th.

ANNATTO.—The large quantity of 118 bags bright seed from Ceylou was shown today. The price asked for this article is 2½d per lb., but there were no buyers.

ARECANUTS.—A parcel of 20 bags was shown today, for which tho pricc of 30s per cwt would be accepted.

CINCHONA.—Another heavy arrival of 177 bales Sonth American Guayaquil bark was for the greater part disposed of today at a fresh reduction in prico of at least 2d per lb ou an average. Good bright quill sold at 1s; partly stout ditto, bright mossy but broken 8½d to 9d; very stout flat spilt quill 9d; broken aud rusty brown at from 6d down to 3½d per lb; 42 bales Maracaibo bark of good appearance were bought in at 9d per lb. Several parcels of flat Calisaya were also bought iu, and only 9 serons damaged sold without reserve at 7½d to 8½d per lb. For a uew parcel of 116 bales from Rosairo, bright flat orange 1s 5d per lb is asked, an offer of 1s 4d being refused. Some very ordiuary red bark, in thin broken quill of every little colour, reaised 1s 1d per lb.

Cocoa Leaves.—Some cases Ceylon leaves were shown today. These leaves were of mixed size, Huanoco character, dark in colour, but strong. Most of the leaves were damaged, and an offer of 2d per lb was the best which was made. It was refused. The New York market on February 1st was almost bare, only a few parcels of light-green leaves remaining on hand.

Essential Oil.—Of Citronella oil, 50 cases in tins sold today at ⅝d per oz.; while for oil in bottles ⅞d is asked by some holders.

COFFEE CONSUMPTION IN THE UNITED STATES IN 1890.

This fell off in 1890, being the slightest since 1887. The figures showing the movement at all ports, exclusive ot the Pacific coast, indicate a total consumption of 209,457 tons, against 216,085 tons in 1889; 216,833 tons in 1888; average for three years, 214,125 tons. Prices were higher and this probably accounts for the shrinkage.

The yearly average cost of Fair Rio was 19·64 cents, against 18·55 cents in 1889; 15·35 cents in 1888; 17·80 cents in 1887; 10·32 cents in 1886; 9 01 cents in 1885. It has been a year of reduced supply and high prices. At times a great disparity existed between grades, and prices ruled above the parity of exchange quotations.

The following table exhibits the stocks and distribution of coffee in 1890 as compared with 1889:—

	1890. Tons.	1889. Tons.
Stocks Jan. 1...	23,098	16,213
Imports in 1890.	201,273	222,970
Total supply 1890.	224,371	239,183
Less stock December 31... ...	14,914	23,098
Distribution in twelve months ..	209,457	216,085
Less exports in twelve months	...	...
Consumption in twelve months ...	209,457	216,085
" monthly average ...	17,455	18,007

The December consumption was only 14,078 tons, being lighter than for any other month during the year. The maximum consumption was in April, when it reached 19,521 tons.

Of the total imports of 201,273 tons, there were 173,111 tons received at New York; 773 tons at Boston; 11,179 tons at Baltimore; 16,210 tons at New Orleans. The imports of Brazil coffee reached 152,280 tons, being 75.6 per cent. of the total imports.

Upon receipt of the figures showing the European consumption, we will present the position of the article in greater detail.—*American Grocer.*

CANNING COCONUTS.

A new industry is springing up in Brazil consequent upon the discovery of an ingenious Portuguese. He has struck the novel idea of canning coconuts in spiced syrups, and these are said to be particularly well received in Portugal, to which country consignments have already been made.—*Australasian.*

TEA ADVERTISING.

"What you think of the latest advertisement? Do you know where this *Dalu-kola* Tea Company have their offices?" This from a London merchat to us, refers to a fly leaf circular which beautifully displayed in coloured ink, runs:—

"Childwick Hall, Beckenham Road, Penge. On Monday evoning, February 23rd, 1891, commencing at eight o'clock, C. S. Hicks, Esq. (of the Dalu-kola Tea Company), will give his celebrated Lecture, delivered at the People's Palace, and throughout the Provinces, on the beautiful Isle of Ceylon, magnificently illustrated by dissolving views, especially painted for the Lecture at considerable cost, and varied by Songs and Music. Chair will be taken by Bryce Grant, Esq. The Proceeds (after paying expenses) will be handed over to the Funds of the Penge and Anerley Philanthrophic Society. Cups of pure Ceylon Tea given away free by natives in their picturesque costumes. Admission by Ticket 2s, 1s, and 6d; children half-price if accompanying adults."

Whoever Mr. Hicks may be, Ceylon surely is indebted to him for advertising her teas?

THE RUBBER OUTLOOK IN BRAZIL.

Regarding the new companies forming in Brazil to control the rubber trade of the Amazon, Mr. Francis Grauert, who is popularly supposed to be connected with such an enterprise, said one day last week:

"At present there are two of these companies in Brazil, and both working in Amazon River centres now. One of them has a capital of five millions and the other twenty, both more than half paid up. There seems to be plenty of money in Brazil with which to organise such companies, as there have been very prosperous times in that country. Coffee has gone up from 7 cents to 15, which has drawn a great deal of money there. These two companies are however, now in competition and in order to obtain rubber sometimes pay more for it than is necessary. "Baron" Vinna is connected with the smaller of the two. With the capital that these companies have, they are in a position to freely advance money to the gatherers from the time they leave any of the large rubber centres on the Amazon into forests, provide for the heavy transportation charges, and carry the crop without any special anxiety until it is marketed.

"Regarding this year's crop, the Rio papers some time ago stated that the season had been a healthy one and rubber was being freely gathered. This state of affairs seems to have changed for we gather from our last mail advices, that rains began to fall in December, earlier than usual, and that sickness was prevailing among the gatherer on the islands, in consequence of which the collectors had began to retire. In the wet season malaria is prevalent, which produces chills and fever in a somewhat aggravated form. Our mail advices are confirmed by a cable of the 8th, which states that the weather is bad, receipts were falling off and that the second half of the crop would be short. We do not believe that present prices are high."
—*India-Rubber World.*

BRITISH NORTH BORNEO NOTES—GENERAL.

February 1st.

At a Meeting of the Lawn Tennis Club, held at the Court House on the 13th January, Mr. Henry King Sturdee the Hon. Secretary on behalf of the Bachelors presented their Handicap prize to Mrs. A. Cook the winner. In handing the cup over, Mr. Sturdee made an appropriate speech, which Mrs. Cook acknowledged thanking the Bachelors, expressing a hope she would long keep it, as a remembrance of the Sandakan Tennis Club and the Sandakan Bachelors. Mr. Cook then invited the gentlemen and ladies present to refreshments provided for the occasion and the Meeting dispersed.

Very heavy rain set in on Thursday January 15th, and with the exception of part of Friday 16th, held continuously up to January 25th. One landslip took place on the road under the new Roman Catholic Convent. Thanks to Mr. Dunnage the main roads where he has lately repaired them have stood the heavy deluge uncommonly well, and thanks to his thorough drainage the water soon runs off, so much so that a few hours sun suffices to put them in hard condition again.

By the steamer "Memnon" which arrived from Hongkong on the 9th January, Mr. J. Robertson returned from leave, looking all the better for his sojourn in a colder climate. Mrs. Robertson accompanied him. Mr. E. F. Skertchley also returned from leave by the same opportunity.

Heavy rains have we hear fallen in the Darvel Bay District. The Tabanac river was in flood for some days, but no damage has been done to the tobacco Estates.—*British North Borneo Herald.*

PAPER *VS.* LEAD LINING FOR TEA CHESTS.

We call attention to two more letters of interest in this connection further on: first from Mr. T. C. Anderson about "Clark's Patent" paper-lead-tea lining which has the reputation of being a very superior but rather expensive article, and next from Mr. Maitland Kirwan about his paper lining. In this latter we get a very important correction on the previous information which reached us from London as well as locally respecting this paper lining. In place of costing more than lead lining as was last related by our London correspondent, the price is really only about *half that of lead lining.* This makes so great a difference to tea planters that we feel sure trials of the new paper lining will be freely made and the matter fully inquired into. The pity is that a Sub-Committee of the Planters' Association is not at once prepared to take up the enquiry and needful testing. Meantime, Mr. Anderson supplies conclusive evidence as to the superior quality of "Clark's Patent" paper-lead, and if Insurance offices charged less for tea so packed, an equality in cost with ordinary tea lead might be established?

YAMS, GRAPES, MANGOES: PRODUCTS OF NORTH CEYLON.

Mr. S. K. Lawton, the very intelligent Tamil gentleman who acts as agent for the Ceylon Steamship Co., Ltd., at Jaffna, writes to us:—

"I send per the S. S. 'Lady Gordon' leaving Jaffna this day a few samples of the food products of the North for your acceptance and trial. Whether it is attributable to its dry climate or the system of careful tillage and well irrigation the food products of Jaffna have peculiar excellence. The 'King' yam has been tried elsewhere, but the yield has been too rapid and watery to be fit for the table, while the grapes and mangoes of Jaffna have been rarely excelled. I find very little of these products are being sent to other parts of the island perhaps owing to their not being sufficiently known. With regular visits of the S. S. 'Lady Gordon' to the different ports it would pay an enterprizing Jaffna man to start a supply agency for these articles. Should a regular trade be thus stimulated the hardworking Jaffna cultivator would be able to obtain a better return for his labour than he does at present by supplying a limited local demand."

It is certainly very strange that there is not a regular trade by steamer. We heard the other day that grapes are still carried in the season by the land-route via Puttalam and Chilaw; but surely not from Jaffna? Our informant, a Chilaw planter, has told us that he notices the pingo men regularly passing and they sell at 50 cents a lb. the grapes which are 75 cents to a rupee by the time they reach Colombo. Then as regards the monster king yams and fine Jaffna mangoes—earlier in season than in Colombo,—the specimens Mr. Lawton has sent us are sufficient to show how much the Colombo markets and the Jaffna cultivator might both benefit by a trade in Northern products. Surely the hint now given will not be lost.

MINING AND GEMMING IN CEYLON.

We have already expressed our regret that the London Syndicate should follow up their most excellent first movement which brought so high an authority as Mr. Barrington Brown to our shores, with a one-sided insufficient system of working. Far better, we shoul think, to delay all operations until they were in a position to send out the expert again with the staff and machinery he might deem necessary to give due effect to his anticipations, or at any rate to develope and test on the lines of his own Report. We trust, therefore, that the members of the London Syndicate may make up their minds that it is no use expecting a satisfactory trial of our gemming and mining country by going to work after an imperfect dilettante fashion. Nothing should satisfy those concerned, but the despatch of Mr. Barrington Brown, to deal carefully and systematically with the most promising of the selected lots of land, leased or purchased on behalf of the Syndicate by his advice during his stay in Ceylon. Before securing the land in many cases, tests satisfactory to the expert were applied and it is interesting to know that some portions have been leased from the famous "Gem Notary" of Ratnapura, who is credited with having amassed altogether as much as twenty lakhs of rupees, while not less than R800,000 is the amount this prince among "gemmers" states he made out of one famous alluvial mine near the town of Ratnapura! In accompanying the expert on one of his testing expeditions, a relative of the notary showed him a spot under some huge gneiss rocks from which he had washed out R20,000 worth of sapphires. If credence is to be attached to such figures,—and Mr. Barrington Brown apparently saw no reason to doubt them,—it is very evident that there is more than a *prima facie* case available for European capitalists to induce them to deal with this Ceylon Gemming Industry.

It was only natural that the expert should at every turn see openings for the application of machinery; for instance in the case of suitable portions of river beds, a steam dredger that could take up the bottom to the depth of 10 feet, could not fail to deal with a large quantity of material, with every chance of success. Then on the higher gem diggings on hillsides and along mountain streams in Rakwana, the application of hydraulic principles and contrivances after the most improved European fashion must have, again and again, struck the expert. On Butiyatenne and Golden Grove—already secured—the Syndicate would have full opportunity for developing hillside pits. The information available as to "finds" in this neighbourhood was also very encouraging:—catseyes realizing from R1,000 to R5,000 each have been not unfrequently picked out of the washings, while, as we recently recorded, larger stones of very much greater value are occasionally found. One way of testing the returns obtained by parties of gem-diggers (all Sinhalese) in the Rakwana district, is found in the periodic sales which are held. Three pits at one of these sales gave results equal to R5,100 for seven weeks' work, and later on, one of these pits, in a similar period yielded stones which sold for over R6,000. A good sapphire, it seems, is worth £6 a carat in Ceylon.

It was surely then no wonder that Mr. Barrington Brown, after spending some months in our Gemming country, closely watching the operations of native diggers and gemmers, testing for himself and collecting all available information, came to the conclusion that quantities of valuable sapphires and true catseyes had been dug up in the gem districts of Ceylon for many years. But of far greater importance is it to know that he is of opinion that after all only *a small, if not insignificant proportion of the deposits have been worked out.* The expert, in fact, is of opinion that there are extensive gem-bearing deposits in certain of our districts and that gems of great value are undoubtedly to be found in such deposits. From the Report furnished to them, the London Syndicate must be well able to judge how far the expert thinks that the lands already secured

by them, share in the valuable deposits to which he refers. For our own part, we consider there ought to be abundant encouragement to induce capitalists to send out Mr. Barrington Brown himself with adequate staff and machinery in order to direct the needful development of a gemming industry on the lands already purchased or leased.

COCONUTS AND CINNAMON.

Kadirana, March 12th.

After three weeks of dry weather there was a good shower on the 7th and a few drizzles each evening since, aggregating 0·95 of an inch. This will help the peeling a little which is just now not good, owing perhaps to a bud now appearing. Cinnamon crops in this district will be much below the estimates on all estates. Coconut pickings are good and will probably continue so till the end of June, but from then to the end of the year they will be very small. Prices are good (R35 to R37·25 per 1,000 on the spot) and should continue so should the price of oil not fall much. Fever is prevalent in the villages.

March 13th.

Fine rain last night; measured this morning 0·69 in.

INCREASING THE SUPPLY OF FISH FOR FOOD.

The ever-increasing work of the fish commissions, state and national, gives ever-increasing cause for public gratitude. This would no doubt be more generally forthcoming were it not for the prevalence of the erroneous notion that the pleasure of sportsmen is the chief object in view. On the contrary, though the angler has his grounds for satisfaction, he is but a secondary consideration in this matter. The main purpose of fish culture is to increase the supply from this economical source of nutriment. As Professor Atwater puts it, "Fish gather materials that would otherwise be inaccessible and lost and store them in the very forms that are most deficient in the produce of the soil." The chief nutrient of fish is protein, in which most vegetables, such as wheat, rye, maize, rice, potatoes, etc., are deficient. It is needless, however, to dilate on the physiological advantages of a protein supply when everybody knows the utility and economy of fish as an article of diet. * * *

Just as trout streams through all the settled parts of the country have been fished out, so the great lakes and the adjacent parts of the ocean have been fished out. The aim of the fish commissions is to renew the supply.

This suggests the most profitable feature of fish culture—the fact that fish is the only crop that doesn't have to be cultivated. To plant and to harvest is all the work. The farms of fresh-water fish, that is to say, the rivers and streams, may be spoiled for them by the offscourings of manufacturing, but that can never happen in the great lakes and the ocean. There is still room and food for as many of them as there were when John Smith could hardly get his ship along for the cod that belabored its sides. But within the memory of living men the supply of food fish has diminished so much as to become a reason for serious alarm.

* * * *

The work of the state commissions (and most of the states now have them) has been mainly directed to the stocking of rivers and ponds, to the erection of fishways around falls and dams, and to the procuring of legislation forbidding the taking of fish during the spawning season. The work in New York, which is at least not the most backward in this respect, will serve to illustrate what is going on through all the country. In the year ending September 30, 1890, the New York commission distributed fry and eggs as follows: Brook trout, 2,699,500; lake trout, 7,476,000; brown trout, 1,246,500; frost fish, 3,320,000; sea salmon, 50,000; land-locked salmon, 18,000; white fish, 3,998,000; ciscoes, 2,400,000; smelts, 200,000; maskinonge, 75,000; California trout, 155,000; pike, 4,000,000; shad, 12,238,688; grand total, 39,844,688. As one instance of hundreds that might be cited from various parts of the country showing results already accomplished, it may be mentioned that last summer, when the fishway was put in at the Mechantville dam on the Hudson, in the shoal water created by opening the gates more than 100 salmon were counted, from one to three feet long, and probably weighing from five to thirty pounds. The largest salmon caught there by angling last season weighed twenty-two pounds, and measured thirty and one-half inches. These fish came from fry put into the Hudson seven years ago from the United States hatchery at Gold Spring, L. I. * * *

The United States commission finds its more important field in the great lakes and the ocean. At Put-in-Bay, Ohio, for example, the hatchery recently completed has a capacity of 250,000,000 white-fish eggs, and it is intended to run it to its full capacity. All the eggs are procured from the pound nets in Lake Erie, and taken from the fish that are on their way to market, and would be wasted were it not for the commission. At Wood's Holl, Mass., the most important station of the commission, the work that bids fair to be most profitable is the propagation of codfish, and the officials have strong hope of making cod again as plenty in New England waters as they were three centuries ago. This hope is based on the fact that in artifical propagation there is practically no loss, while the loss under nature's care, or rather, lack of care, is tremendous. In the natural process only a small part of the eggs become fertilized, and so many of the infant cod get devoured that probably only 1,000 or 2,000 out of 1,000,000 survive. The female cod averages 1,000,000 eggs, of which probably 950,000 can be saved in the hatchery. If the commission can furnish to the water as many fish from one cod as nature can from 10,000 or 100,000, it will not take many years to make a big impression on the cod supply. It is the same with the lobster, and with other products of the fisheries. Indeed, there is ground for expectation that ultimately fish may become our greatest and cheapest source of food.—*Bradstreet's.*

Quinine at its Lowest?—Where is the fall in price of Cinchona Bark and Quinine to stop? From the monthly report of Messrs. C. M. & C. Woodhouse, dated February 19th, by this mail we learn that

Very few transactions were reported in Quinine, which was quoted nominally at about 1s per oz. for German during the first 10 days of this month, however, some forced sales drove the price down to 10d per oz. (*the lowest price on record*); this decline attracted buyers, and a large business was done, chiefly at 10½d to 11d; latterly, again the tone has become quiet, and there are sellers at 11d. As will be seen below, the shipments of Bark from Java during December were very heavy, being estimated at about 1,250,000 lb.

Quinine at 10d and 11d per ounce! and yet we venture to say, the great majority of retail buyers, in the country districts of the United Kingdom at least, continue to pay 1d per grain or at the rate of 40s per ounce!

WATTLES: TIMBER AND FUEL TREES AND INDISCRIMINATE PLANTING.

(From the Hills.)

THE WEARY BEWILDERING WATTLES.

If, as Professor Maiden of the Sydney Technological Museum indicates, the fine, thin-leaved and small-blossomed specimen he has so courteously sent of the Sydney *Black Wattle* correctly represents the normal *Acacia decurrens*, then, I quite agree with Dr. Trimen that it has not yet been grown in Ceylon. I have grown and seen many of the Australian "wattles," but anything with such minute leaflets as Dr. Maiden's specimen of what he regards as the true *A. decurrens* has never come under my notice. On the other hand we have on Abbotsford some magnificent trees, the foliage and blossoms of which exactly agree with Dr. Maiden's specimen of the "Green Wattle," *A. decurrens*, var. *mollissima*, the prince of all the wattles for yield of tannin. Our Abbotsford trees also agree with Mr. Kellow's and the fine specimen at Hakgala. But I hope to do what Mr. Kellow suggests, take the Australian specimens and some of our own to compare with his. To a non-botanical eye the *mollissima* variety of *A. decurrens* would seem to be the type, luxuriant in leaf and blossom as it is robust of stem. Although it is not tannin but timber and firewood that we want here in Ceylon, we cannot help feeling that Baron von Mueller's *mollissima* is the variety of *decurrens* which we should grow at altitudes about 4,500 feet, for I have heard that at lower altitudes the Australian wattle shave not been a success in Ceylon. What will the Baron say to the variety about whose merits he has written in such enthusiastic terms being botanically abolished? It is beyond measure puzzling to find the Victorian botanist, whose fame is world-wide, after giving a general description of *A. decurrens*, Willdenow, *the* tan wattle, as a small or middle-sized tree, which, besides timber, "supplies excellent firewood," adding, "the typical *A. decurrens*

WITH LARGER LEAFLETS,

occurs particularly in New South Wales, rises seldom above 30 feet; it has, according to the Hon. Dr. J. Cox, a bark of less tannic strength than the tree distinguished as *A. mollissima*." So that the Victorian *A. decurrens*, probably *A. mollissima*, which we have got in Ceylon, cannot be Dr. Maiden's typical species. If by "larger leaflets," longer branchlets and spines are meant, the statement is quite correct, but with our popular conception of leaflets, those of the var. *mollissima*, certainly convey the idea of being larger because so much denser. Von Mueller also describes the seed of *mollissima* as "somewhat smaller, comparatively shorter, rounder and not so flat as those of *A. dealbata*, while the funicular appendage does not extend so far along the seeds, nor is the pod quite so broad; from those of *A. pycnantha* they differ in being shorter, thus more ovate than elliptical." In our warm moist Ceylon climate *A. decurrens*, like other Australian trees, grows more rapidly and to greater size than it generally does in its native habitat, Von Mueller gives a separate place to *A. mollissima*, and states that "most of the notes under *A. decurrens* refer more particularly to *A. mollissima*." The reason, therefore, why the *A. decurrens* grown in Ceylon is var. *mollissima*, is probably that all the seed was obtained from Melbourne. Maiden says of the normal *A. decurrens*, what is probably true of the variety we are growing in Ceylon, that even in a green state it furnishes an excellent fuel. One of the merits of *A. decurrens*, so far as my observation goes, is, that it does not send up suckers so freely from its spreading roots as other kinds do, especially that which has formed so dense a grove at the Nuwara Eliya church, and *A. dealbata*. The specimen of this latter species, the silver wattle, sent by Dr. Maiden, is doubtless, as Dr. Trimen stated, identical with the kind grown in Nuwara Eliya which so seldom flowers. It is the least beautiful of all the wattles growing on the Plain. I wish, however, that, besides seed pods, the specimen sent by Professor Maiden showed the inflorescence also, for I am now puzzled what to call the acacia, beautiful alike in stem and leaf and blossom, so flourishing near the church and elsewhere in Nuwara Eliya, and which was popularly known as

"THE GOLDEN WATTLE,"

until the exclusive title of *A. pycnantha* to that name was asserted. The truth is that many, perhaps fifty out of the three hundred or so, of acacias in Australia, bear yellow blossoms and are popularly known as "golden wattles," the flowers being used as a substitute for the "may" or white-thorn blossoms of Britain. What troubles me is the fact that the denizens of Ootacamand, on the Nilgiris, who are waging war against the over-prevalent *A. dealbata*, write of it as "the yellow wattle," a name surely more descriptive of the acacia we have mentioned as forming the grove at the church in our sanatorium, than of the silver wattle which so rarely flowers? *A. dealbata* is described by Baron von Mueller as sometimes attaining a height of 150 feet, and besides being useful as timber, serving principally as

SELECT FUEL OF GREAT HEATING QUALITY.

This would render it very valuable to tea planters, but the inhabitants of Ootacamund complain that when the trees first grown, so long ago as 1840, were cut down, the ground got filled with interlaced roots, from which there have sprung innumerable suckers, so dense in growth as to constitute an insanitary nuisance. On the occasion of a former crusade against the all prevalent and encroaching wattle the Madras *Mail* wrote of the myriads of suckers which come up with renewed vigour and amazing rapidity as fast as they are cut down, and form *an inexhaustible fuel reserve*. Col. Beddome, however, stated that although this wattle grows very readily from the stool (after being coppiced), it comes up in a dense mass of small twig like stems, so that it can only be depended on for *very small firewood*. Dwellers in Nuwara Eliya, before further extending the cultivation of *A. dealbata* and the beautiful golden-blossomed species, which sends up suckers even more readily, may well take warning by the experience of Ootacamund, where the Municipality is invoking the aid of Government to get rid of what all agree has become

AN INTOLERABLE EVIL,

while secondary and indescribably dense stems are not to be compared, so they assert, as firewood with blue-gum, original stem and coppiced. We can testify from our own experience that blue-gum coppices most readily, at almost any age, the secondary stems being even more luxuriant and healthy looking than the original trees. There is one thing to be said, however, as to the encroaching tendency of *A. dealbata* suckers,—that the soil of Nuwara Eliya is considerably poorer,—we speak of the grassy Plain—than that of Ootacamund. Dwellers in the Ceylon sanatorium are not likely, in imitation of those in the Nilgiri health resort, to pass from a perfect *furore* for planting groves of firewood trees, to a wild demand

that a clean sweep or next to that should be made of the woods which they now declare are impeding the circulation of fresh air and stifling them. Considerable space in the *South of India Observer* of Feb. 14th is occupied with the evils produced by the

INDISCRIMINATE PLANTING OF TREES

in Ootacamund. Major-General Jennings had recommended :—

(1) The restriction of all further planting of trees within Municipal limits.

(2) The gradual reduction of the existing number of trees to within a certain fixed number per acre.

(3) The extirpation of the yellow flower Acacia (*A. Dealbata.*)

(4) The gradual removal of the causes of all undergrowth.

These recommendations were unanimously agreed to by the Municipal Council, at a meeting at which

A paper by Mr. George Oakes giving a description of the Melanoxylon, the Acacia Dealbata and the Eucalyptus, and a brief account of the introduction of these trees into Ootacamund was read, and the Sub-Committee report.—

"The ground within Municipal limits is overgrown with trees to an extent detrimental to health, and incompatible with proper sanitation.

"Large areas of land are shut out from the purifying influences of the sun and wind by trees and the undergrowth from them, which give cover to decaying vegetation, and noxious matter."

"The Melanoxylon and Dealbata which are to be found growing in every direction, possess the property of extending their roots to a considerable distance, and of throwing up suckers therefrom, which in places have become dense thickets. The ground is penetrated in every direction by the roots of these trees and thickets springing up from them may be seen in course of formation on all sides."

"The examination of the ground under the surface reveals a closely interlaced network of roots. The extent to which these roots have grown, can only be realized by inspection. They are ever spreading and increasing, and there are now few spots in Ootacamund to which they have not extended."

"The Committee are of opinion that an evil of serious magnitude has resulted from the planting of the Dealbata and Melanoxylon trees within Municipal limits, and from the excess to which the planting of other trees has been carried ; and that unless special measures are adopted, and powers beyond those contained in the Municipal Act conferred on the Municipality to enable it to deal with the evil, it can neither be checked or remedied."

The Sub-Committee suggested:—

(1) "That a restriction should be placed on the further planting of trees within Municipal limits.

(2) That the existing number of trees should be gradually reduced to within a certain fixed number per acre.

(3) That the growth of the Acacia Dealbata within Municipal limits should be prohibited.

(4) That a Committee of five members nominated by Government, viz., the Collector of the District, or the Chairman of the Municipal Council, as may be deemed expedient, and of which the Medical officer of the station and Forest Officer residing at Ootacamund shall be *ex-officio* members, shall be appointed to report to, and advise the Municipal Council, on matters connected with the planting of trees within Municipal limits, and with the working of such bye-laws as may be passed on this subject.

(5) That an Inspector, to be appointed by the Chairman of the Municipal Council shall be sanctioned for such time as may be necessary to carry out the provisions of such bye-laws as may be passed.

Mr. Peet, who we suppose is the Government Commissioner or Collector, wrote a commonsense Minute on the subject, but even he demands the extirpation of *A. dealbata*, which, to our bewilderment he calls, from its flowers, no doubt, "the yellow wattle," while with us "the silver wattle" seems the more appropriate term, judging from its foliage and not by its flowers, which are, with us, so seldom seen. Mr. Peet wrote :—

"I would remark that I took the opportunity of going round with Mr. Geo. Oakes and yourself (the Chairman of the Municipal Council) to see some of the growth near the station to which attention has been drawn by the Municipal Council, and it is very clear that some remedial measures are called for, particularly with regard to the thickets of Yellow Wattle (*Acacia Dealbata*). The suggestions of the Municipal Council however go rather further than Government is likely to sanction in my opinion.

"I think that suggestion 1 might be feasible and would be advantageous, and that Government might possibly be inclined to limit future planting within Municipal limits.

"Suggestion 2 however does not strike me as practicable. Reading it with the proposed bye-law 2, which proposes that the number of trees per acre should be limited to 50, it seems to me that Government would never sanction such an interference with private property, and that there would be a very large bill for compensation. Looking at the question from a Forest point of view, I find that the following reserves are within Municipal limits, viz.:—

A good part of Aramby, nearly half Snowdon, half of Dodabetta, more than one-third of Craigmore, all Elk Hill, half of Lovedale, the whole of Manjimkora, Bathai and Feru Hill, half of Cairn Hill and parts of Mathana Sholah and Fairlawns.

"Parts of the reserves mentioned are planted with exotic trees, but the greater portion is under indigenous forest growth. Most of these reserves lie at a distance from the more inhabited parts of the Settlement, but as being within Municipal limits would still come under the purview of this far reaching suggestion.

"There is another consideration namely, that trees grown in the open as a rule, branch extensively, and fifty trees put down per acre would with some species have as much effect in retarding air as 200 or more which run up as poles.

"There are numerous other difficulties which suggest themselves, not the least of which would result from a power of inquisition being given to the Municipal Council. Again there would be irritation at the power of sanctioning (under Bye-law vii.) an excess of trees in certain places, when another claimant might consider himself equally entitled to favorable consideration, and it must not be forgotten that it would be necessary in very many cases to grant such exemptions, since one of the great reasons for planting originally was to break the force of the wind which would otherwise sweep through the station.

"Dr. Cleghorn records the opinion of three doctors on the subject of tree planting on the Nilgiris, when the experiment was in its infancy, One states : 'I consider the subject to be one of great importance, both in a sanitary and economic view.' He then goes on to state that his opinion was that the larger proportion of disease at Wellington than at the neighbouring station of Coonoor is due, in a great measure to this circumstance, viz : the want of wood ; as in all other respects, height, temperature, exposure, &c., there is scarcely any appreciable difference between the two places.

"I think that by planting trees judiciously great benefit would be derived, not only from the shelter they would afford, but from the good effects produced by a moderate quantity of vegetation in purifying the atmosphere !

This reminds us that when the soldiery in exposed barracks in Jamaica were suffering severely and many dying from fever, Sir Wm. Fergusson, the eminent physician, cured the evil by means of

A SHELTER BELT OF QUICK GROWING TREES.

Mr. Peet's Minute proceeds thus:—

"The opinion of the other two doctors coincides in the main with the above. There is therefore something to be said on both sides as to the planting of trees

in high situations particularly, and the power sought by the Municipal Council in Suggestion II. and Bye-law II does not seem to me what Government is likely to grant.

"Bye-law III. would stand or fall with Bye-law II. Bye-law IV. would be useful in many cases: but might be a dangerous instrument of annoyance. Is it not already sufficiently provided for under the present powers of the Municipality in case there is danger to be apprehended from the growth objected to?

"I think it would be useful in many cases to save people in spite of themselves, for nothing strikes one with such astonishment as the callous way in which people build or live in houses, under trees which a moderate cyclone would bring down to the entire destruction of the buildings

"Bye-law V. would be most useful if practicable. If the Municipal Council is prepared to compensate owners for eradicating yellow wattle there is not one word to urge against what would be a most useful provision. If however the Council is not prepared to give compensation I think that an order to eradicate the pest would be rather despotic. That it is a pest I agree most cordially, but I do not see that there would be much chance of getting powers from Government to do more than keep the thickets cut down at intervals.

"It might be possible to get Government to rule that no trees of yellow wattle should be planted, and even that all *trees* (as distinguished from wattle thickets) should be cut down, in order to minimize the danger of an extension of the roots. I do not think that black wattle *Acacia melanoxylon*, comes under the same category, except under very exceptional circumstances. Bye-law VI. would be useful in many cases, though even that might cause irritation."

So far Mr. Peet. To quote again:—

Mr. George Oakes in his minute remarks :—"That in 1883 the Special Sanitary officer, Surgeon-Major Nanney adopted vigorous measures for the eradication of the *Acacia Dealbata* or yellow flowering wattle, which were fairly successful, but as he was unable to legally insist on land holders clearing their land, several large areas were left to spread. The *Acacia Dealbata* appears to have been introduced some 50 years back, when owing to the scarcity of trees in the station, it was largely planted by holders of property as avenues, and to mark the boundaries of their holdings. The trees originally planted having been cut, and the roots left in the ground has led to the present dense growth of brushwood, which is as unwholesome as unsightly. As regards the value of the tree for fuel and timber, it ranks amongst the lowest of the imported Australian trees, a straight well growing tree being the exception. On these hills it seems liable to canker, which attacks the tree just at the junction of the stem and the roots, and is the cause of their suddenly falling. From the roots left in the ground thousands of suckers spring up, and continually spread. It is noticeable that these suckers seldom grow up into trees, but seem to expend their force in extending their roots, which form as dense a net-work under ground as the suckers do above. There are very dense growths of this tree at Bishopsdown, Greenway, Koodah Cottage, and at the back of the Club; but hardly any property in this station is entirely free.

"Immediate and energetic steps should be taken to eradicate the pest: stem, root and branch.

"The *Acacia Melanoxylon* grows a dense handsome tree, and is useful for fuel and timber if the trees are mature and the wood after being sawn up allowed to season. The great drawback to growing the tree, in the station, is the extent to which it throws out roots—frequently 25 to 30 yards from the trees, from which other young trees spring up which again extend their roots, it is therefore one of the worst trees to plant near buildings.

"The *Eucalyptus Globulus* was introduced subsequently to the Acacias, and is now of the three species mentioned, the only one planted to any extent. Within the last fifteen years the very extensive planting of this tree in the station in many cases 3 feet by 3 feet and within six feet of dwelling houses has had a detrimental effect on the health of the inhabitants.

"The tree in itself is most harmless and the essential oil distilled from its leaves, a most valuable addition to the Pharmacopœia; but the dense plantations of it preventing the sun from reaching the ground and the free circulation of air are inimical to the health of those residing in the vicinity. Apart from the above reasons it is noticed that any springs or wells in the vicinity are quickly dried up!

"The roots of the Eucalyptus though large and spreading and dangerous when planted too near buildings have not the habit of throwing up suckers and spreading as do the acacias. The wood is the best fuel we have and timber sawn from trees thirty years old is suitable for beams and rafters of roofs; but is of no use if subjected to damp.

"If planted in moderation by those of the residents who wish to have a few trees for shelter or fuel the Eucalyptus is the best they could plant, but they should on no account be planted closer than 20 by 30 which will give 48 trees to the acre."

I think it will occur to readers that where the object is to bind loose soil, such as road and especially railway embankments, *A. dealbata* will be of great value; while, finally, although tree planting ought to be carried on with discrimination in Nuwara Eliya, it will be very long indeed before dwellers in our Sanatorium will imitate the Ootacamundites in their complaints against too much shade and shelter from the planting of exotic trees. The bareness, rather, of many parts of the grassy Plain needs redeeming by judicious arboriculture.

HAILSTORMS IN MASKELIYIA.

March 13th.

The hailstorm on the 28th February must have been very local, or some notice would have been taken of it. I send by post some tea and cinchona leaves perforated that will give you an idea of what the force and quantity of hail that came down was. It made the dogs and fowls hop. In the back verandah half-an-inch of hail stones were on the mats, and some of the largest I have ever seen almost as large as a pigeon's egg. The noise on the shingled roof was a caution. * A few estates down the valley from here neither hail nor rain fell though it poured ("buckets") up the valley. You perceive it went clean through old and hard tea leaves. A carpenter showed me a paper umbrella that the hailstones had gone through, and I must say it looked like it. The perforated holes were from the outside and the appearance of being holed as he described.

COFFEE FROM ABOUT KORAT, SIAM.

It seems likely that a new industry will be added to the wealth of Siam, and that the cultivation and sale of coffee will become an important trade in Bankok.

The more we hear about Korat, from those who have visited that part of the country, the more we are convinced that this large area offers favourable conditions of elevation, soil and climate to open out plantations for the cultivation of the Arabica coffee berry. The culture now seems, says the *Bankok Times*, to have been superseded in Ceylon by tea, for we no longer hear any mention of coffee from the famous old plantations that for so long a time commanded the coffee marts of Europe. Thus the world's supply is diminished by the amount of the falling off from that source. Then year by year the taste for coffee has extended until it is no longer looked upon as an article of great

* The leaves—large ones too—are completely riddled with holes as if shot through. We are fortunate in Ceylon in having a visitation of this kind, so much less often than tea planters in North India.—ED, *T. A.*

luxury, but is now classed among the necessities of life. Hence notwithstanding that consumption increases, production has not kept pace with it. The supply now is therefore not equal to the demand, nor can it be expected to overtake the consuming powers of the world's population even under a vastly increased production for the next two decades of time. The outlook therefore is very favourable for the planter as regards a market.

In casting about for new lands possessing all the eligible advantages of aspect and situation, with the essential conditions of temperature and humidity, we can confidently invite his attention to the newly opened up table lands approaching Korat. We are told that, on these table lands the surface formation is of a rich friable loam, with a deep sub-soil, that cracks and opens with the sun in the dry weather; and that it varies in colour from dark brown or chocolate to a reddish yellow according to locality, the former indicating the presence of humus and the latter oxide of iron. Indication of the presence of the mineral ingredients is highly favourable in soils for the cultivation of the coffee berry, as showing a soil less burdened with insect life, and the vegetation less liable to attack from insects. It is also asserted that the railway will pass over country of this character. having an elevation of 1,200 to 1,300 feet for a distance of over fifty miles.

Here the direct communication, which the railway will secure, places all the obstacles of accessibility which generally impede plantation enterprise by Europeans in eastern countries, out of the question; and at once makes easy the way for selecting a suitable strip where operations may be commenced at once. Two conditions which face the planters at the outset are difficulties of access and the preliminary surface examination of a jungle covered country. The railway here sweeps away all obstacles involved in the former and aids in facilitating the latter by placing the planter at any spot along the whole line, obviating all delays in procuring supplies and the conveyance of plant and material, cooly labour, &c. And in respect to cooly labour for any kind of agricultural operations in Siam no great trouble need be feared, and for the cultivation we are now considering there is every probablity that all the labour required can be procured in the country abundantly. Indeed, the cultivation of coffee Arabica would work in so well in this country as to give employment to a large amount of labour which is not now in demand for more than half the year. The coffee plant being raised in nurseries and transplanted out when attaining to nearly six months old, would naturally be sown just after harvest and be ready to plant out in April with the commencement of the early rains. Meanwhile the land would be cleared and prepared ready to receive the young trees before the breaking up of the land for paddy in May. Hitherto coffee has only been cultivated in a small way by native cultivators but sufficiently extensive and over a succeeding number of years, to satisfactorily prove its capabilities both in respect to soil and climate; it seems, therefore, that were the cultivation entered upon by the skilful planters who proceed systematically, enlarging their fields year by year, coffee growing would be found to provide an additional source of labour without greatly increasing the demand, whereby its price would not be rendered any more costly to general employer, and at the same time Siam might hope, in time, to be included among the coffee-producing countries of the world.—*British Manufacturer.*

RHEA IN CHINA.

A paper on 'The Cultivation and Preparation of Rhea in China' by Mr. Hosie, H. B. M.'s Consul at Wenchau, was forwarded by the Director of the Department of Land Records and Agriculture, Bengal, with an enclosure from the Government of India. The opinion of the Society was asked whether the renewal of efforts on the part of Government, to introduce the Rhea industry, is required or likely to produce practical results; the reply sent is given below. Mr Hosie's paper on the extraction and preparation of Rhea fibre applies more especially to Western China, and to the Province of Chêkiang, and deals but slightly with the Central Provinces where the bulk of China grass is grown.

The cultivation of Rhea is referred to in works written before the Christian era, and from these early records downwards there are numerous references to the subject. Mr. Hosie gives an original translation of an article in the *The Nung-Chêng ch-üan shee* or complete treatise on Agriculture, published in 1640, not having M. Stanislas Julien's translation to refer to (M. Julien's translation was re-printed in the Society's Journal in 1850). The treatise gives what may be called the standard system and Mr. Hosie's object is to show how the practise differs from this in the Province with which he deals. His notes treat of (i) Soil and climate; (ii) Cultivation of the plant; (iii) Harvesting the crop; (iv) Extraction of the fibre; (v) General: and very full Meteorological Tables are attached by way of appendix. In section (iv) of his notes Mr. Hosie makes the following interesting statements:—"I can confidently assert that a Chinaman can extract fibre from the peel, at the rate of 12½ ounces an hour. There is no cleaning required: the fibre is cleaned in the process of extraction. I give the results of my experiments. A bundle of peel collected from one hundred stems in fifteen minutes, weighed 3½ lb.; after being steeped in the tub of water for some time, it was taken out and found to weigh 4½ lb. The workman at once commenced upon it and in thirty minutes extracted the fibre, which, in its wet state, weighed 1¼ lb. It was then hung over bamboos in the open air and left to dry for six hours, when it weighed 6¼ ounces. A similar bundle of peel produced exactly the same result. Working ten hours a day, therefore, one man can produce 125 ounces, or nearly eight pounds of fibre ready for the market, in a day. As a matter of fact, the workman told me that he could extract eight catties or 10⅔ pounds a day; but I prefer to give eight pounds as a maximum.

Mr. Hosie then enters into some calculations as to the probable outturn per acre. He estimates, from repeated measurements and calculations, that a crop of 80,000 stems can be reckoned per acre giving, on the data shewn above 312½ lb. of dry fibre. As three crops are cut annually, Mr. Hosie considers that the outturn may be held at under 937½ lb.; the third crop being inferior in produce to the two others.

Mr. Hosie's paper will appear in the Journal, Part I, Vol IX.

The following is an extract from the Society's letter to the Director of Agriculture, Bengal, in reference to Government taking further steps to introduce the Rhea industry:—

The Director,

Department of Land Records and Agriculture.

Sir,—I have the honour, by direction of my Committee, to refer to your office memorandum No. 2153 (Agricultural), Proceedings in Original Revenue Department, Bengal, No. $\frac{3}{2}\frac{210}{63}$ (Mis. F.), dated 8th September 1890, with enclosure, regarding the Rhea plant in China.

2. In my letter, dated the 27th November, I had the honor to state that the Society would have pleasure in publishing Mr. Hosie's interesting report in the next issue of the Journal, and asked that some time might be allowed for the Society to make inquiries before replying to the last paragraph of the Government of India's letter, which formed one of the enclosures, *viz.*, whether a renewal of the efforts on the part of Government to introduce the Rhea industry is required, or likely to give practical results.

3. I am directed to say that the Council of this Society are of opinion that little benefit is likely to result from a renewal of Government efforts in the direction indicated. The Council consider that it is already so widely known that the cultivation of Rhea offers no difficulties, that it is needless to take further steps to prove this; and as regards the offer of Prizes for machines, which can prepare the fibre cheaply and efficaciously the form which Government encouragement has

taken heretofore), the Council are of opinion that should a really useful and practical machine be invented, that the inventor would find it more to his advantage to patent the machine and place it before the public, rather than to claim the Government award, which, unless made an unusually large one, would not be commensurate with the advantages the inventor would then be called upon to resign.

4. From the inquiries made by one of their number during a recent visit to England, the Council have reason to believe that the demand for Rhea fibre for superior purposes is still very limited, and the manufacturers prefer to buy the fibre in its roughest state, rather than clean, their profit being derived from cleaning and working this up into thread, between the price of which and clean fibre there is but a small margin.

5. As regards further inquiries into the systems followed in various parts of China, the Council desire me to say that Mr. Hosie's report seems to afford all the information which can be desired, and would indicate that, though the systems may differ locally from the standard, there is not enough encouragement in what is now known of that, to warrant their recommending any large expenditure in acquiring further information.—*From Proceedings of the Agricultural and Horticultural Society of India.*

THE COCOA BEETLE.

His Excellency Sir W. H. Hutchinson has, it is said' appointed a Commission to enquire into the circumstances of the ravages of the Cocoa Beetle, "probably one or more kinds of longicorn Beetles undetermined," the same as we have here. The Grenada *Chronicle* says that "acres and acres of trees chiefly of young growth have already fallen victims to it and many more are threatened." The plan they have found effectual is the same that we commonly use, and consists in employing numbers of young boys and girls who dig out the larvæ from under the bark. The *Chronicle* adds:—

"Unless it is employed generally, however, by every planter and manager it will not be of much avail, for as fast as one destroys the grub on his property the full grown insect produced and nurtured in the fields of his less careful neighbours, will attack his trees and keep up a supply of grubs. United effort on the part of the planting body of our island is therefore absolutely necessary, if a foe that threatens to be desperate is to be suppressed ere it assumes uncontrollable power."

The difficulties with the Cocoa Beetle therefore in Greneda are similar to our own with regard to the Parasol Ant. One thing is certain with regard to this pest, and that is very consoling; the Beetles almost invariably confine their attention to trees 3 or 4 years old. In the last number of *Timehri* Mr. Elivan Prag reports on the destructive qualities of some minute Scolytid Beetle which have been known only to attack Cocoa plants within the last year, but which, he says have been the cause of death to the plants over a very considerable area of plantations. Mr. C. Waterhouse of the British Museum of Natural History determines them as *Xyleborus perforans.*—*Trinidad Agricultural Record.*

UVA NORTH-WEST, Feb. 28th.—This has been a most abnormal season—a very mild, warm N.-E. monsoon. Jan. fine; but first 18 days of Feb. rain every day, 9 inches. old, misty weather since; dry, thin wind, cold. Thermometer seldom went below 60° and as seldom exceeded 70°. A deal of the coffee crop is early but a very ugly sample. Early pruned tea has flushed fairly well, but unpruned shut up. It has been a good season for new clearings, and few supplies should be required. Sinhalese &c. doing their best to get hold of some of our coffee, but our own coolies being the chief thieves they are hard to catch at it; they watch Durai and the watchman! Glad to see some find grevillea shade stops green bug; but it is not so in my experience. Coffee wants to die out.

ARTIFICIAL FERTILISATION OF CINCHONA FLOWERS.—A Mr. J. Bosch has recently suggested a process for the artificial fertilisation of cinchona flowers, which is attracting a great deal of attention in Java, so much so that the Dutch Indian Government have appointed a commission to investigate the process, and report as to the results.—*Chemist and Druggist.*

SOUTHERN INDIAN INDUSTRIES.—The Mysore Government has granted a concession to Mr. W. F. Peter Hay, of Hunsur, of the exclusive right to manufacture sandal oil within the Mysore State for a period of ten years from the date of commencing distillation, subject to certain conditions. A royalty of 3·25 pie per oz. weight of oil manufactured and issued is to be paid to Government once in three months. The concession is conditional upon work being stated within one year.—*Indian Engineer,* Feb. 28th.

"AMHERSTIA NOBILIS."—This splendid leguminous tree is reported to have been seen in flower within the past few days, in the Museum grounds—a very unusual experience in Colombo. It flowers in Peradeniya, but scarcely matures any seed. We quote from the *Treasury of Botany* as follows:—

Amherstia. A genus of the Pea family (*Leguminosæ*), named in honour of the Countess Amherst. *A. nobilis* is the only species. It grows near Martaban, in the Malayan peninsula, and attains a height of about forty feet. When in flower, it is said to be 'one of the most superb objects imaginable, unrivalled in India or in any other part of the world.' The leaves are equally pinnate, large, and, when young, of a pale purple colour. 'The flowers are large, scentless, and of a bright vermilion colour, diversified with three yellow spots, and disposed in gigantic ovate pendulous bunches.' The tree is cultivated in some of the larger English gardens; but requiring so much space is seldom met with in collections. The Burmese name of the plant is *Thoca,* and handfuls of the flowers are offered before the images of Buddha.

SALT FOR AGRICULTURAL PURPOSES.—We have a great deal of sympathy with the object which a correspondent has in view in the letter (see "B.") addressed to us on this subject The efforts made a good many years ago, by the Planters' Association to get the Ceylon Government to agree to allow salt be used, free of duty, as a manure, were very persistent and forcible. Nor did the Government of the day refuse attention: on the contrary a whole series of experiments were made with the view of seeing how salt could be so mixed and adulterated as to make unfit for human food, while still useful for agricultural purposes. But success in their experiments was not attained. We always felt, however, that the standard fixed was a too stringent one. Practically, we cannot conceive that any estate coolies or other of the lowest of the people would have tried for a moment to utilise for food, some of the manure mixtures then tested. But the Government refused to run the risk and so with superabundant stores of salt available, none can be used as manure, however beneficial it may be demonstrated by "B." and others to be. For this reason, even more than on account of the tax on food, we should like to see the Government monopoly of salt removed. We do not believe any hardship is involved by the tax on the people so far as the condiment is concerned; on the contrary in remote districts we feel sure the poorest of the natives have salt made available to them at far cheaper rates than if, without tax, the distribution were left to private enterprise. But it is certainly very hard that such a tax should prevent salt now lying idle, being utilised in agriculture where its application is desirable.

Correspondence.

To the Editor.

LINING FOR TEA CHESTS: MR. MAITLAND KIRWAN'S PAPER: VERY LOW PRICES.

London, E. C., Feb. 19th.

Dear Sir,—I notice from certain correspondence in your *Overland* edition that some misconception has arisen as regards the price of my new tea paper, and I fear I myself may have been to blame for this mistake in not showing sufficiently clearly the price of the paper alone apart from the chest. Let me now explain clearly that the paper itself, sufficient to line a 100 lb. chest, costs 8d, say *eightpence*, f.o.b. London, as against say 1s 3½d cost of lead. The paper is supplied in three pieces, one to go round the chest measuring 28 by 87 inches, and the other two for top and bottom, measuring each 17″ by 12″. A further consignment leaves next week and can be procured from my agents in Colombo. Will you kindly give this letter publication in your next edition.—Yours faithfully,

J. M. MAITLAND KIRWAN.

P. S.—Planters desirous of trying the paper can be supplied with sufficient for a small consignment free of charge.—J. M. M. K.

WOODCOCK IN THE FORESTS OF THE EASTERN LOWCOUNTRY OF CEYLON.

Trincomalee, March 4.

Sir,—Noting your correspondent "B. L.'s" letter regarding woodcock in Ceylon, I may mention that I flushed one in Nov. last, a few miles off the Mahaweliganga, in the forest of Tambalagam Pattu about 10 miles inland. I saw it clearly, as it flew off from near my feet, and it was not the wood snipe. A jack snipe was shot at Kantalay a few years ago by Mr. Colls, P. W. D., and the range of our Scolopacidæ probably varies greatly in special seasons.

H. N.

CACAO CULTIVATION IN CEYLON: MR. J. H. BARBER'S EXPERIENCE.

Colombo, March 5th.

Dear Sir,—The enclosed letter from my agents Messrs. W. H. Davies & Co., coming so soon after your publication of Dr. Trimen's letter to the Colonial Secretary, may be of interest to cacao growers.

Throughout the last season my agents dealt with criollo or Caracas alone, from my properties near Kandy. But last week I sent them a small consignment from the grove Ukuwela which is planted entirely with the "Forastero" varieties. You will see that, although they obtained the same price for the one variety as for the other, yet those most interested in the trade, and therefore best qualified to speak to the market value of the respective varieties, are far from inclined to come to a decision on their intrinsic qualities and claims, from the mere prices obtained for them just now, as Dr. Trimen has done. In fact they seem to think very differently.

I have also to touch on another point advanced by the writer. There is a paragraph in Dr. Trimen's letter raising a doubt regarding Mr. Morris's statement that Ceylon is indebted to the Dutch for the introduction of the Criollo cacao. It may be interesting to have more light thrown on this point. For instance the reasons for the statement of the one and the arguments for the doubts raised by the other. Both are so well qualified to enter into the investigation that it would be a pity to let the matter rest in doubt. As regards one of the statements however made by the latter, that the earliest record to hand dates so late as 1819, *i.e.*, twenty years or so after British occupation, there is this much to be said, that when the British came in, it did not follow that the Dutch vacated the island. So that the island was not solely populated by the British and the natives. Nor could we trace back the date of the introduction or planting from the date of the existence of a tree, so as to say with justice or truth, "I believe it to have been then quite recently introduced." We are talking in 1890 or 1891 of a tree said to have existed in 1819. Who can undertake to say without further evidence on the point, which certainly has not been placed before the public, that the tree referred to was not 20 years old then, and the cacao, after it has attained maturity, is of all trees one about whose age there might be much speculation without certainty. What may be worth inquiring would be as to how much the British nation was interested in the cultivation of the cacao plant in other colonies in the first and second decade of the XIXth century, so as to have known its value as an industry. It may be also germane to the issue to ascertain whether cocoa was esteemed as a beverage in Great Britain, about that time, or whether it was purely a Continental drink.

The names Criollo, Forastero, &c. point to the adoption of the plant by the Portuguese; and when we remember the fact of the Portuguese having been in Ceylon before the Dutch, we can account for the knowledge in Ceylon of the value of the plant even in those early times.—Yours truly,

JAS. H. BARBER.

Colombo, March 5th.

J. H. Barber, Esq , Kandy.

Dear Sir,—We beg to advice having sold your parcels of Forastero and Caracas cocoa, from Ukuwala and Kandy respectively, at R63 per cwt. We may point out to you that Caracas is most preferred by London buyers on account of its superior quality, though Forastero is occasionally sold at good prices, as in the present instance, owing to its fine *appearance*. We are, however, informed by those most interested in the trade, that the latter would not fetch anything like the price of Caracas if shipped in large quantities. Kindly note this.—Yours faithfully,

W. H. Davies & Co.

CLARKE'S PATENT PAPER LEAD LINING.

Gartmore, Maskeliya, March 9th.

Dear Sir,—Perhaps the best testimony in favor of "Clarke's Patent" Paper Lead Lining for tea chests as yet received, is the following:—A break of 7,000 lb. of Arslena tea packed in this lining was shipped in the "Nepaul." It was considered like the other lots of tea to be so damaged that the Insurance Company paid up the full amount of the insurance. I now learn from Messrs. Gow, Wilson & Stanton, that the tea, after examination, was fit for sale, and that they sold it on behalf of Insurance Company for 1s per lb. B. Pekoe, 10½d Pekoe, and 7½d Dust.

Your London correspondent's friend is mistaken in saying a planter had complained of the excessive cost of "Clarke's Patent" Lining. I have always said it was *necessarily* dearer than lead alone, but the cost is only a few cents more per chest.—Yours truly,

T. C. ANDERSON.

CACAO CULTIVATION.

Kandy, March 13th.

DEAR SIR,—In the Report of the Director of the Ceylon Botanic Gardens for 1890 there seems to be an error as regards the export of cocoa, the figures for 1889 being quoted as those of last year.

The figures given by the Chamber of Commerce may, I suppose, be taken as fairly accurate :—

1889	..	..	cwt. 19,054
1890	..	..	,, 15,981
Decrease			,, 3,075

This result hardly supports the statement that the industry here may be considered to be in a satisfactory and improving condition.

If the Director had moved as freely amongst the villagers as an "Ideal Planter," he would long ago have fully understood why they have taken so little advantage of his gratis distribution of seeds. The more enterprising natives who went in for cultivating a few cacao trees could, as a rule, obtain all the seed they wanted from the nearest estate, without the trouble of asking for it; while others have usually been able to obtain a few bushels at any time, in the same way, for the mere trouble of picking.—Yours faithfully, PRÆDIAL PROGRESS.

[Still, villagers in Kegalla and throughout Sabaragamuwa generally can scarcely be guilty of the thefts in the Kurunegala district? The export in 1888 was equal to 13,159 cwt. so that taking the three years, we have not done so badly; perhaps cacao is to distinguish itself by alternate big and average crops.—ED. *T. A.*]

JAVA SUGAR PALM.

Matale, March 13th.

DEAR SIR,—A "gumpty palm" or as some call it the Java sugar palm had flowered and I got the sap drawn from it same as we do with the kitul, coconut or palmirah flower, but the result has been very unsatisfactory. Compared with our sweet-toddy, its taste is like dirty tank water. Boiled down to a sixteenth, it was like an infusion of cinchona bark. Is any of your readers able to tell us how the sugar is obtained and whether the sap could be drawn sweet. —Yours faithfully, A. VAN STARREX.

CACAO of the Forastero description is, we learn, being planted both in the Negombo and Kalutara districts under the advice of an experienced planter and with the object of giving it a fair trial

A GUM-PRODUCING PLANT.—In the last part of the *Icones Plantarum* is an account of Eucommia ulmoides, a most singular Chinese plant, as yet but little known to botanists, and the true affinity of which has yet to be discovered. "The most singular feature about the plant," we read, "is the extraordinary abundance of an elastic gum in all the younger tissues—excepting, perhaps, the wood proper—in the bark (in the usual sense of the word), the leaves and petioles, and pericarp; any of these snapped across, and the parts drawn asunder, exhibit the silvery sheen of innumerable threads of this gum." The trees are raised from seed by the Chinese (Patung and Szechwan are districts named), and when sufficiently grown, are felled, and the bark taken off. To this the natives attribute wonderful medicinal properties, the value of which has yet to be proved by Europeans. Patterns were formerly made from the wood, and the young leaves are sometimes eaten. It is hoped that at no very distant date a fresh supply of specimens will be obtained, which will enable those interested in this wonderful plant to prosecute their researches still further. It is to Dr, Henry that we owe what little we knew of this important plant.—*Gardeners' Chronicle.*

"CRIOLLO" AND "FORESTERO" are not Portuguese words, as Mr. J. H. Barber seems to think, but Spanish, meaning simply "indigenous" and "exotic" (literally "home-bred" and "foreign). Any theory, therefore, as to the introduction of cacao into Ceylon by the Portuguese, founded on the use of these words, is untenable.—*Cor.*

TEA IN UDAPUSSELLAWA is described by a gentleman who has recently travelled for 22miles along the district road from Nuwara Eliya, as veryfine: from the 6th to the 13th mile out, there are perhaps no finer sheets of tea in the island, he thinks, than are to be seen in this splendid undulating upland district.

AT A RECENT MEETING of the Académie des Sciences, Paris, M. Charles Naudin read a paper on the Eucalyptus tree, which contained some interesting observations. He began by remarking that owing to the peculiar tendency of this tree to change with age or climate and to produce crosses, there was only one good work on the subject—namely, the monography of Mr. Ferdinand Müller,* of Melbourne. M. Naudin has made a study of the eucalyptus as transplanted into Europe. At Thuret, near Antibes, in Provence, there is one of the finest collections of the tree in Europe. It comprises eighty species, or about half the total number known to exist. The gum tree was originally confined to Australia and the islands in geographical relation with it. M. Naudin thanks that all its varieties have been derived from a single prototype subsequently to the separation of Australia from the Asiatic continent. But the tree has a great practical value, as it grows rapidly, and furnishes excellent wood for construction or fuel. M. Naudin thinks that all the Southern countries of Europe would profit by its cultivation, and that, above all, the tree may be a boon in the Transediterranean colonies of France and the roads and settlements of the Sahara and Central Africa.—*Globe.*

SNAKE-VENOM.—Dr. Lauder Brunton has communicated to the *British Medical Journal* a note on snake-venom and its antidotes, in which he reviews the work which has been done to determine the nature of the active principle of venom. Very little that is certain is known about it but probably the substance is an albumose, although globulins also appear to have something to do with the action. For instance, the venom of the crotalidæ contains a comparatively large amount of globulins, and produces local swelling and blackening of the parts, while that of the cobra contains comparatively little globulin, and has little local action. The globulins and albumoses in different venoms are probably not altogether identical, for the albumose of the cobra seems to have a greater power to produce convulsions than that of the rattlesnake. It would appear that there is some resemblance between snake-venom and the albuminoid products of the anthrax bacillus, which like the albumoses of snake-poison, produce much local œdema, sluggishness, coma, and death Like the venom albumose, its activity is lessened but not destroyed, by boiling. But, in addition to these substances, Dr. Sydney Martin has obtained an alkaloid which has the same action as the albumose, but much more powerful, and this alkaloid, he thinks, is present in a nascent condition in the albumose, and is separated from it by the tissues of the living animal into which it has been introduced. As to the remedies for snake-bite Dr. Brunton seems inclined to pin his faith to the subcutaneous injection of strychnine in small and repeated doses, whisky or brandy being simultaneously administered.—*Chemist and Druggist.*

* Such is fame! The gentleman referred to is Baron Sir Ferdinand von Mueller, K.C.M.G, F.R.S., &c.—ED. *T. A.*

THE SILVER POOL IN NEW YORK.—A telegram from New York in *The Times* announces the break-down of the American Silver Pool. It says: By the defeat of the Free Coinage Bill, the great silver speculation in Wall Street has ended. Millions were lost in the "deal." Last July, when it was thought that the Bill providing for the purchase by the Government of 4,500,000 ounces of silver a month would pass, pools were made up to buy bullion in expectation of a great advance. The conclusion was correct. When the pools began operations, silver was a dollar an ounce. On the passage of the Bill, it jumped to 1 dol. 21¼ cents. To make the silver in a dollar worth a dollar in gold it would have to be quoted 1 dol. 29 cents. The men in the pool expected the rise to go to 1 dol. 25 cents, as the law was to go into effect in August. The calculated production of the American mines for the ensuing year would be 65,000,000 ounces. Of this, the Government would be required to purchase 54,000,000 ounces. The arts would use 9,000,000 ounces, and the surplus was reckoned at 2,000,000 ounces. America had previously been a heavy exporter. The pools conducted their negotiations entirely in New York.—*H. and C. Mail*, Feb 27th.

WOOD IN FIRE.—Wood cannot be rendered incombustible, or more strictly speaking, non-alterable by heat; but its non inflammability may, to a considerable extent be insured, so as to prevent buildings from a limited and temporary fire at any rate until assistance arrives. It is, however, hopeless to expect a building encumbered with inflammable substances to pass through such a test uninjured. The methods of preserving wood against fire are of two kinds; the injections of saline solution and the application of a paint or coating. The former appears but little practical; and, indeed, short of proof to the contrary, it must be considered dangerous in the case of wood of large dimensions. This system is, however, applicable to small pieces of wood. Of all the substances recommended, a concentrated solution of phosphate of ammonia is undoubtedly the best, the use of this substance, notwithstanding its high price possessing such great advantages that it should be employed in all cases where expense is no object. In the majority of cases, however, coating with brush is the only practical solution of the question, and the Ghent professors recommend as the substance suitable for use inthis manner, cyanide of potassium and asbestos paint.—*Professors Bondi and Denny, of Ghent University.*—*Indian Engineer.*

FERROID, A NEW ARTIFICIAL STONE.—Under this title Mr. Hermnn Poole describes in the *Journal of the Association of Engineering Societies* a new artificial stone, which is a compound, partly chemical and partly mechanical, of iron, sulphur, and silicon with more or less foreign matter. It is mainly a super saturated solution of iron in the sulphur with the silica acting as a binder and hardener. Its normal colour is a dark slate, varying somewhat with the manner in which it is dressed, but the colour can be somewhat modified by the introduction of pigments. Successful imitations of various coloured brick and sandstone have been made. It is about the hardness of ordinary bluestone, and can be worked by the usual stone-cutting tools turned in a lathe, or planed. The tensile strength is from 650lb to 1,200lb. per square inch and under compression it endures from 9,000lb to 12,000lb. Its specific gravity is about 2·6. It molts at about 300 deg. F. very slowly. It does not deteriorate under exposure to the weather. As it can be melted and moulded, it is applicable to a great variety of uses to which stone cannot be put, and particularly so for large castings, such as pipes for sewage, &c. Architectural forms can be very conveniently made from it in position if needed. For culverts and bridge foundations the perfect smoothness of which the surface is susceptible is advantageous in lessening water friction.—*Indian Engineer.*

NEW NICKEL MINES.—It is reported that quite an extraordinary discovery of nickel has been made quite recently in Nevada. Among those best informed it is spoken of as "a wonderful development," and this representation is supported by the exhibit of masses of ore. It is claimed that the nickel is found in deposits almost limitless and of such richness that even what is termed the lowest grade yields 8 to 12 per cent. of pure metal. Quantities aggregating hundreds of tons are in sight, which give by analysis from 20 to 35·4 per cent. of ingot metal.—*American Mail.*

COOLIES AND INDIAN TEA.—So far as the Chairman's address to the Indian Tea Association in Calcutta went to show, the coolie difficulty is becoming more pressing than ever to tea plantations. Not only has the increase of acreage under cultivation tended to send up the price of labour, but the new railway and mining enterprises in the District of Chota Nagpur have diverted a large number of coolies. In Ranchi and Purulia as much as R150 a head has been offered for coolies. The District of Ganjam has turned out to be a failure as a recruiting ground. There has however been a constant and rapid increase in the total acreage under tea.—*M. Mail*, March 9.

INCREASING CONSUMPTION OF TEA, COFFEE AND COCOA.—Strong evidence of the advance of the "wave of temperance" and the general increase in the consumption of non-alcoholic drinks of late years, is given in a carefully-compiled table just prepared by Sir Henry Peek. The figures refer to tea, coffee and cocoa, and they embrace a period of fifty years—that is from 1840 to 1890—being the average consumption per head of the population as shown for each year since 1840. The most remarkable progress is to be noted in the consumption of tea. In 1840 the tea consumed was 1·22 lb. per head, in 1850 it was 1·86 lb., in 1860 2·67 lb., in 1870 3·81 lb., in 1880 4·57 lb. and in 1890 5·07 lb. In 1840 the population was 26,487,026 and in 1890 38,227,321. In respect to coffee, the consumption was in 1840 1·08 lb. per head of the population, in 1850 it was 1·13 lb., in 1860 1·23 lb., in 1870 ·98 lb., in 1880 ·92lb., and in 1890 ·75lb. Of cocoa the average consumption per head of the population was in 1840 ·08lb., in 1850 ·11lb., in 1860 ·11 lb., in 1870 ·20 lb., in 1880 ·30 lb., and in 1890 ·53 lb. Of these three articles together, their total consumption per head of the population was in 1840 2·38 lb., and in 1890 6·35 lb. The chief augmentation has been in tea, which has vastly advanced in popularity in this country.

THE ALLIGATOR AS A COMMERCIAL COMMODITY.—Besides the hides of the alligator, of which 50,000 or 60,000 are annually utilised in the United States there are other commercial products obtained. The teeth, which are round, white, and conical, and as long as two joints of an average finger, are mounted with gold or silver, and used for jewellery, trinkets, and for teething babies to play with. They are also carved into a variety of forms such as whistles, buttons, and cane handles. This industry is carried on principally in Florida. Among Chinese druggists there is a great demand for alligators' teeth, which are said to be powdered and administered as a remedy. As much as a dollar apiece is paid by them for fine teeth. All the teeth of the alligator are of the class of conical tusks, with no cutting or grinding apparatus, and hence the animal is forced to feed chiefly on carrion, which is ready prepared for his digestion. Other commercial products of the alligator are the oil and musk pods. The tail of an alligator of twelve feet in length, on boiling, furnishes from fifty to seventy pints of excellent oil, which, in Brazil, is used for lighting and in medicine. The oil has has been recommended for the cure of quite a variety of diseases. It has a high reputation among the swampers as a remedy for rheumatism, being given both inwardly and outwardly.—*Public Opinion.*

THE CEYLON PLANTING DISTRICTS GENERALLY.

TEA AND TEA PROSPECTS—"NEXT YEAR" AT LAST—11D A GOOD AVERAGE WITH LOW EXCHANGE—TIMBER TREE GROWING—FUEL AND MANA GRASS—TEA TRANSPORT AND THE RAILWAY EXTENSION AND OPENING UPCOUNTRY—LABOUR—MANURES—FREIGHTS COFFEE—CINCHONA.

(By a Planting Visitor after some years' absence.)

I note with pleasure most marked improvement and progress everywhere in tea and tea prospects, and I have not the slightest hesitation in saying, that I consider the prospects of Ceylon as a tea-producing country have improved during the last two years by 20 per cent and most estates have individually so increased in value. Prospective estimates of some years ago, made by very capable men (such as Mr. Rutherford) have proved, so far as yield goes, far from correct. Upcountry estates more particularly have given, and will give, far larger returns per acre than even the most sanguine could have expected. To Ceylon, I think, the long-looked-for "Next Year" has at last come; and I see no reason to fear its departure for many a day, but let us "ca' canny"! Everywhere not only better but good times are apparent; money is being freely offered at low rates (may planters not be led away by such commissions and many etceteras follow; fortunes are seldom made on borrowed capital, while small savings are often lost), estates are changing hands at high figures, folks are going home by the dozen, forgotten furlough circulars from several Companies are being reissued, salaries raised, and liberal commissions given. All this is as it should be, times justify it, and deserving men are remunerated in a measure for the dark days Ceylon has passed through, let us hope for ever.

For some years to come it will not be for our interests to see Ceylon teas averaging more than 11d. High prices will curtail its spreading into channels where it is at present unknown, and 11d, with present exchange ought to be the height of our ambition for a time. I think we shall always find a sympathy between exchange and prices, Uudoubtedly at present there is such.

I rejoice to see timber trees being introduced into our tea districts to the extent they are, as not only supplying a want too keenly felt, but with the object of breaking up large areas of one product, and so distributing disease as brought on by insect life in a tropical country like Ceylon. I trust, on another visit, to note the length and breadth of Ceylon's tea districts well covered with timber and fuel trees. Fuel is undoubtedly becoming a serious consideration to many estates. I wonder mana grass is not utilized as a heat generator. I feel pretty certain that in time, compressed blocks, composed of mana grass with something else, say a little tar, will be introduced as a fuel, and I see no reason why it should not be so. Why does that dead-and-alive Government of ours not offer some handsome reward for the introduction of a substitute for wood, as a fuel for tea factories?* Compressed mana grass has been tried as a substitute for boards for tea boxes; was successful so far as to show it could be compressed, and if so I doubt not it would burn well. Any quantity of the article could be grown in the island.

Tea lead will find a substitute shortly I doubt not; the sooner the better. I have long had an idea that our teas could successfully be transported in specially made air-tight bags, from the firing machine on the estate to central packing and sorting factories, sufficiently removed from Colombo as to be away from the sea air. The saving thus in transport of packing materials would be immense, to say nothing of innumerable other expenses. At present, with up and down rail rates, we pay on the packing materials about 50 per cent of what the net tea costs us to transport to Colombo. Teas in properly packed airtight bags would not, I think, suffer either in quality or by being broken into dust, even on so badly a worked railway as Ceylon can boast of

Railway extension from Nanuoya seems to make progress Government has apparently laid down that land above a certain elevation is not to be opened up. A railway is constructed on such land, and so the principle that a railway is to *open up* a country disappears. We are always learning something!

Labor seems by no means too plentiful. Our Government always manages to put some spoke in the planter's wheel to retard his complete progress and the success of the Colony.

Freights seem at present higher and scarce; among other useful works of the C. P. Association, some enterprising line of steamers might be approached with the view of dealing with Ceylon teas exclusively, and not leave us to take "what is left," in the way of room.—Results from *Manuring* of tea estates seem so far a success. If labor be plentiful, tea prices and exchange as at present and certain obnoxious manures such as coconut poonac be avoided, the investment is sound.

Of good old *Coffee*, I have seen little; it will be grown again in the island some day, but not I fear successfully till the present specimen has died out, and its bones and disease rotted away.—*Cinchona* has disappeared in two years in a marvellous manner, certainly 50 per cent, and the self-sown plants are not there as they used to be. If the tree will grow, it is no bad investment to grow it, but stocks of quinine are very heavy in London and the Continent, and though constan ly changing hands are not used up.

Lowcountry products I shall in every sense leave alone.

* Is it not rather the duty of the Planters' Association?—Ed. *T. A.*

HILLCOUNTRY PLANTING REPORT.

NANUOYA, March 17th, 1891.

WHITE CLOVER

to our Irish friends in Colombo (by way of substitute for the true shamrock), until after the tappal was gone. The history of that same white clover is very curious. I got the seed from Australia in 1879 or early in 1880, and sowed it in the valley in which our tank was subsequently formed. There it continued to flourish year after year; and about 1885 we removed plants of it to a lawn in front of the upper bungalow. Subsequently the lawn was dug up, the grass and clover were entirely removed from the soil (so it was thought), and the space was laid out as a flower garden. About a year ago a portion was dug pretty deeply and manured for the reception of flowering plants; when, suddenly, the white clover came up more fresh and flourishing than ever, and filled an entire bed with its snow-white blossoms and its pretty, trijunctive green leaves. We cherish the freely flowering clover for the sake of "Home" associations and also for

the illustration it affords of the wonderful vitality of the genus of plants to which it belongs. Have I not read that the roots of the red clover have penetrated the soil from 3 to 4 and even 6 feet down into subterranean drains, and not only that they conserve nitrates in the soil, but that the plants to which they are attached enrich the land in which they grow with nitrogen derived from the atmosphere? The *leguminosæ* are now found to be still more valuable in this respect, and some readers of the *Observer* may remember that Baron Liebig, writing to the late Mr. Crüwell, advised the coffee planters of Ceylon to grow lupins between the rows of their trees, to be turned down as green manure, so imparting to the soil their stores of nitrogen. I suppose that tea, which is a leaf-crop, requires even more than coffee

SUPPLIES OF NITROGEN;

and it would be interesting to know if any experiment has been tried in burying green plants in the soil in which tea grows, before the blossoming or at any rate the seeding stage of such plants. In the experimental station at Cawnpore, hemp has been found an excellent improver of the soil by being buried in its green stage. I have never grown green crops for the purpose of being buried; but early in its existence I treated a patch of tea to an application of green *nilu* plants laid along hollows between the rows, with China bean manure sprinkled over the *nilu*. We believe we see the good effects of that application to this day, a dozen years after the experiment was tried; but, of course, the China bean cake being in itself highly nitrogenous, it is impossible to say what portion of the benefit was due to the *nilu* beyond the mechanical effect of

OPENING UP THE SOIL TO AERATION,

a very important process. If lupin seed cannot be easily procured, or if lupins will not readily grow here, any pea or bean will suit,—chick pea, gram, kollu or even scarlet runners. In our American exchanges we find constant reference to peas grown as green manure for orange and other orchards; and we submit that experiments should be instituted in Ceylon. Clover, as well as beans and peas, might be tried, the only objection being, that, as our experience here has shown, it is easier to get clover into a soil than to eradicate it.

The railway extension, the progress of which towards Uva we watch with interest each morning and evening as it is being completed across Abbotsford, was

PROJECTED TO SAVE UVA COFFEE.

For that purpose it was sanctioned too late, but from those best able to speak with authority, we have recently had the assurance that it is now certain that, in serving the new staple tea, it will receive more traffic than ever could have been yielded by the old. In how many other ways it may serve Uva and other districts on the eastern side of our "Great Divide," who can possibly predict? It will facilitate

THE INTRODUCTION OF MANURE,

labour, capital and European enterprise, and as that enterprise prospers so will all native interests from the growing of rice, maize, legumes and millets to the culture of roots and leaf-vegetables and fruits, for the superior growth of the latter of which the climate is specially favourable. Cattle farming and dairying and even manufactures (that of paper from mana grass to begin with) are pretty sure to follow. Judicious irrigation schemes by all means, until even the arid parts of Uva grow a surplus of cereal food; but for the success of irrigation and all other enterprise, the one desideratum is to be found in

FACILITIES OF TRANSIT AND INTERCOMMERCE,

such as good roads laid the foundation of, and to which the railway puts the crowning top-stone. At Nanuoya, as your readers are aware, our mountain railway attains an altitude of 5,297 feet above mean sea-level. The engine entered Abbotsford eastern boundary, 1½ mile from Nanuoya, at an elevation of 5,497 feet, and will leave the western boundary for the Government forest at a few yards from the second mile, having attained an altitude of 5,558 feet. The gradient at the entrance is 1 in 52·80 and towards the exit it is eased to 1 in 55. There are two large cuttings in this serpentine line of half a mile. One severs a ridge which runs down the estate and across which a foot and horse bridge will be placed to restore the connection. This cutting is over 31 feet high, while the much more formidable cutting at the outlet from the eastern side of the estate (the land runs more than 2 miles from north to south) is about 53 feet in perpendicular height. A still greater cutting beyond the 3rd mile with which Mr. Rosling has to deal, and from which a slip of about 1,000 cubic yards had at one time to be cleared away, is 80 feet perpendicular and fully 100 in the slope. For a little more than a mile beyond Abbotsford, the line goes through

BEAUTIFUL FOREST SCENERY,

the forest sloping up the sides of the Katapihillamana range. It then runs between the cultivated land of Penmynnydd and Calsay and the forest to the 5th mile. Hence to the 7th there is magnificent scenery of forest, river, waterfall, gorge and ravine. Beyond, the rolling grassy prairies known as Elk Plains open up, framed in by forested mountains. On these Plains the Ambawala station to suit the New Galway and other estates near Hakgala will be placed. The patanas stretch nearly up to summit level, which is practically the height of Nuwara Eliya, and where, we suppose, there will be a station, which the opening up of Horton Plains may yet render important.

Just as I wrote the above I received a letter from a correspondent in Uva about the *damba* tree He writes;—

"In *From the Hills* in your issue of 10th March you say 'the *damba*, a mere variation of *jambu*, is, I suppose, the *wal jambu* of Trimen's list, but certainly the natives pronounce the name *damba*.' They are right. That is the proper name of the tree. Next to *Millille* and *Leang* it is the best building timber in Uva. One store I built with it 30 years ago is now as sound as ever. It used to abound formerly, you will recognise the name in *Damba-gaha*, *Damba-tenne*, *Dambawelle* and *Damba-gas-talawa*,—*gas*, the plural of *gaha*—Jambu gaha is the tree bearing the jambu fruit, sometimes called the rose-apple, bright pink on *one side* and which I first saw in Bengal before coming here—is a totally different tree growing at a much lower elevation and *not* choice timber. The *wal jambu* is the wild tree in the jungle and like the wild mango, and wild nutmeg (*molibodde*) next to useless for building purposes. Our tea flourishing all over Uva flushes all through the hot weather and the continuous wet. By the bye, where is Uva, which name is not Sinhalese or English or any known language, is it Euvah or Youvah?"

I gather, therefore, that while *damba* is, as I have long known, one of

OUR BEST HILL TIMBERS,

the tree known as *wal jambu* is very inferior. It is curious that Trimen, who gives *dan* and *maha dan* as Sinhalese names for Eugenias, ignores *damba*, which is no doubt the Elu form of *jambu* and applied to the mountain species. In Trimen's list the Sinhalese name for one plant is actually *tolol!*

March 18.

Speaking with the reserve begotten of experience, it looks as if the rain burst of March had about

EXHAUSTED ITS MOISTURE STORES.

Yesterday was a genial day, with a few rolls of thunder and a shower in the afternoon which deposited 34 cents of rain. The evening was beautiful, with veils of white mist floating across the faces of the mountains. A golden sunset was succeeded by silvery moonlight, incessant lightning flashes making themselves visible *in the south west* horizon. This morning is calm and sunny, although masses of mist rest on the brow of Totapola and other mountains which separate us from Uva. The thermometer stands at 55°.

SALE OF ESTATE PROPERTY.

Mr. Withers has sold Adelaide estate, Lower Dikoya, to Mr. H. L. Forbes for the Scottish-Ceylon Tea Co. It is certainly a bargain for the Company as adjoining one of their outlying properties, Benachie, for which it affords waterpower, Adelaide has 158 acres fine tea all but 50 acres in bearing with 47 acres in forest and not less than 25 available chena. The price paid is only R30,000. The secret of such properties being sold at moderate rates is no doubt found in the fact that a tea plantation with fully equipped factory requires to be of a much larger acreage than the average coffee estate, to ensure economical, profitable work. We are pleased to see the process going on which will bring not less than 400 to 500 acres of tea in bearing to each factory.

TEA IN THE GALLE DISTRICT.

What tea can do in the lowcountry is evidenced by the prices obtained yesterday by Messrs. Forbes & Walker for "Freds Ruhe" which is only about 130 feet above sea-level, close to Galle, owned by Mr. Wm. Abeyesundra of the P. & O. Co. The prices were as follows :—

1,110 lb. B. B.	60 cts.	885 lb. Broken Tea	37 cts.
2,500 lb. Pekoe	45 „	165 lb. Dust	31 „
2,501 lb. P. S.	40 „	62 lb. Red Leaf	32 „

These rates compare favorably with many of those realized for tea from the high districts, and seeing that the cost of laying it down in Colombo is under 30 cents per lb. there is an excellent margin for profit. "Freds Ruhe" estate comprises about 270 acres, of which 210 are in full bearing, the output being manipulated by a Brown's Desiccator and Blackstone Roller propelled by steam power. The results obtained from this estate should be welcome to the shareholders of the Talgaswela Tea Company and other low country concerns, which are now coming into bearing. Who dare despise the lowcountry after this?

THE MARKETS FOR TEA—AND PROSPECTS.

(*By one interested as a grower.*)

The latest London statistics and reports show that Chinese low priced teas are still urgently wanted by the trade (not necessarily by the consumers). In the late spurt Chinese congou rose rapidly until about 80 per cent from lowest point was reached. This is unfortunate and augurs not well for India and Ceylon in the near future. This great rise took place too when exchange dropped to its lowest. No doubt some large orders went out to China for "more" for mixing purposes.

America unfortunately appears to be chockfull of tea just now, and prices there are said to be lower than in London. 70,000 half-chests said to be kept back by American buyers at Amoy, for they fear to ship and depress still further prices in America!

Australia is said to be threatened to be almost surfeited by shipments from India, and prices there are soon, it is stated, likely to be lower than in London.

So *Russia* at present seems to be the great point to make for Ceylon, but their stewing process in place of 5 minutes' infusion, and only one brew does not augur well for a Russian demand for strong teas from India and Ceylon. Still the Russians must be converted at any cost—Ceylon cannot do without some very large market in addition to the United Kingdom.

If in the present season Ceylon ships 55 millions and India 115 millions—not at all unlikely—to the United Kingdom, and China shipments begin to swell out again under the impulse lately given, who shall prophesy as to what prices may be a year hence! China is still the unknown quantity, and until fairly ousted from the United Kingdom (to begin with) must always remain a disturbing factor so long, of course, as thousands of unblushing blenders continue to flourish.

VALUE OF VEGETABLES AS MEDICINE.

There can be no doubt that many of the ailments we suffer from are the result of abstinence from vegetable diet, or a too great indulgence in animal food. Custom has made the potato an essential at the dinner table, but rarely do other vegetables find their way there. The following notes as to the uses of vegetables are from the *California Farmer and Dealer*:—

Spinach has a direct effect upon the kidneys.

The common dandelion, used as greens, is excellent for the same trouble.

Asparagus purges the blood.

Celery acts admirably upon the nervous system, and is a cure for rheumatism and neuralgia.

Beets and turnips are excellent appetisers.

Lettuce and cucumbers are cooling in their effect upon the system.

Onions, garlic, leeks, olives and shalots, all of which are similar, possess medical virtues of a marked character stimulating the circulatory system and the consequent increase of the saliva and the gastric juice promoting digestion.

Red onions are an excellent diuretic, and the white ones are recommended to be eaten raw as a remedy for insomnia. They are—tonic and nutritious.

A soup made from onions is regarded by the French as an excellent restorative in debility of the digestive organs.—*Mildura Cultivator.*

GARDENING: OUR REVIEWER.

FIRMINGER'S MANUAL OF GARDENING, for Bengal and Upper India,* has recently seen its fourth edition and is this time very carefully and ably revised, corrected and amplified by H. St. John Jackson, late editor of the *Indian Agriculturist*, and for several years Superintendent of the Public Gardens at Jeypore.

This is a most useful and valuable book, supplying all the information that an amateur horticulturist can wish for, and thus it certainly fulfils the intention of its author. The botanical names are also correct. The notes on the cultivation of each genera are really first-class, and it would be hard to improve them, and cultivators will be sure of success if they faithfully carry out these instructions. There is something said about nearly everything that is at all likely to do in the East, and the book is so well arranged that any information one may want is very easy to find.

Firminger's book is an old favorite with Indian residents; the plan of the book in this new issue is somewhat altered and improved. It is divided into four parts, viz., (1) the operations of gardening; (2) the vegetable garden; (3) the fruit garden; and (4) the flower garden. An appendix has been added

* Thacker, Spink & Co., Calcutta, 1890.

giving the recent introductions among flowering and ornamental-leaved plants; also new chapters are introduced dealing in considerable detail, with grass conservatories, orchid houses, fernery and propagating frames, with illustrations. The largest additions will be found in part IV., where new chapters are given on Ferns, Orchids, Mosses, Roses, Aroids, Palms and Crotons, &c. The volume consists of 662 pages; the type is clear, and the binding substantial.

The first chapter treats of Climate, Soils and Manures, and this latter subject is treated very fully, the directions about preparation of charred vegetable manure, about the mixture and due proportion of fertilizers, and the relative values of various applications are all practical, and can easily be followed and carried out. Vegetable, mineral and liquid manures are separately treated. In Chapter II. are treated the Laying out of a Garden, Lawns, Hedges, Irrigation, Conservatories, Betel-Houses, Implements, Vermin, &c., c. The information on the erection of Grass-Conservatories or Betel-Houses may have practical interest for some Colombo residents. We quote from it as follows:—

"Some time ago the happy idea occurred to Dr. Anderson that structures, somewhat similar to those in which the natives of Bengal have from time immemorial grown the Pan, or Betel plant, might be employed with advantage in the cultivation of plants that in nature exist in a climate nearly alike to that in which the Betel thrives. The attempt was made and proved a wonderful success. The structure in itself is a simple and inexpensive thing. On a piece of ground, measured out according to the space required, stout bamboos are driven at intervals, so as to stand erect about seven feet high. To these a lattice of split bamboos is attached, much in the way in which enclosures for fowls are usually made in this country. Over the whole lattice, on the sides as well as the tops, a layer of *Ooloo* grass is bound, just so thin as to allow of an equal proportion of sunlight and shade, producing a kind of subdued light. Stages are then erected, either of brickwork or wood to rest the potted plants upon, with space left for paths around or between them.

"When about to erect a grass conservatory, select a piece of ground away from the shade of large trees. Its length should, if possible, run north and south. The size will depend upon individual taste, and local circumstances and surroundings. 50 feet by 30 feet is a convenient size."

The tat-house is, indeed, already introduced into Colombo, and ferns and sellaginellas thrive well in it; but to those who have not seen them, the hint may be useful. Most interesting are the succeeding chapters on the various ways of multiplying and propagating plants, on cutting, budding, layering, grafting, &c., &c.

On one of the operations of gardening, *i.e.*, Root-Pruning, it is remarked that the Indian practice is the reverse of the English; instead of removing the soil at some distance from the roots, they dig up close around the stem, clear away some of the small roots, and after a week or two fill in with manure and cover over again with soil. The object is to make fruit-trees healthy by keeping their roots near the surface.

Then follows next a calendar of operations for every month in the year for Vegetables, Fruits and Ornamental Plants. And then comes the Vegetable Garden. Every kind of vegetable and of fruit-tree is named, and the due treatment of each is given.

The remaining portion of the book is devoted to the Flower Garden, including Ornamental Annuals, Ornamental Trees, Shrubs and Herbaceous Perennials, a very full list, and the directions for the cultivation of each are complete.

CINCHONA IN UVA is fast becoming a thing of the past, and although the young clearings on Canaverella afford a picture of robust health, yet the laird now looks forward to the day when tea may take the place of cinchona. Mr. Macfarlane, on the whole, has been, we suppose, the most successful grower of cinchona in Ceylon on a considerable scale.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F. L. S., F. G. S. &c.,

EDITOR OF "SCIENCE GOSSIP."

An American professor of agriculture, Professor Atwater, has just published the result of a series of experiments concerning the proportion of NITROGEN taken up by PLANTS. He showed that with nitrogenous fertilisers the proportion of nitrogen in the produce, both stalk and seeds of crops, was notably larger than in similar produce where no nitrogenous fertiliser was used. Comparing American with European crops, Professor Atwater demonstrated that in respect to their relative richness in nitrogen the crops from the liberally fortilised soils of Europe yielded considerably more than the same crops in America. From this it appears that nitrogenous fertilisers vary and increase the food value of feeding crops without increasing the yield in weight.

Professor Bruckner, a Swiss artist of Berne, has recently called attention to the existence of CLIMATOLOGICAL PERIOD OF ABOUT 35 YEARS FOR THE ENTIRE GLOBE. These periods are, of course, more marked in the interior of contino its. The years 1700, 1740, 1780, 1815, 1850, and 1880 appear as cold, wet periods; whilst the years 1720, 1760, 1795, 1830, and 1860 were warm and dry universal periods. During the warm periods, the passage of oceanic air to the continents has been hindered, and during the cold periods it has been favoured, increased rainfall taking place in the latter case.

PAPER PULP is one of those things a good many inventors think of. It promises to lend itself (like a professional politician) to anything—from cellulose or artificial ivory knife and fork handles and billiard balls to railway waggon tires and rails. It is a carbonaceous raw material out of which a good deal can be made—a kind of manufacturing protoplasm in short. I refer to this fact because of a paragraph, which appeared in a French technological journal last week, announcing that a certain French manufactory is now bleaching paper pulp by ozone. The latter is a powerful bleaching agent, as many Lancashire and Yorkshire bleachers know. In the French manufactory, it is stated the ozone is prepared by passing electrical dischargos through oxygen, whilst the paper pulp is passed continuously through a chamber containing it. This process is said to be far more rapid than that by chlorine (hitherto the latter has been chiefly used in our Lancashire bleachworks), and far more convenient. Moreover, the ozone does not attack the cellulose itself, as is almost necessarily the case with the chlorine process. It only abstracts the native or raw colouring matter. This new process will probably startle our Lancashire and Yorkshire bleachers.—*Australasian.*

RIO JANEIRO.—The Vicomte de Saint Leger has just established in Rio a company under the title of the Companhia Floricultora Brazileira, for the purpose of providing amateurs with Orchids and other plants. The capital is 500:000,000 reis, or 1,250,000 francs =£50,000.—*Gardeners' Chronicle.*

CEMENT.—Professor Alex. Winchell claims to have a cement that will stick on anything. The recipe is as follows:—Take two ounces of clear gum arabic, one and a half ounce of fine starch, and half an ounce of white sugar. Pulverise the gum arabic and dissolve it in as much water as the laundress would use for the quantity of starch indicated. Dissolve the starch and sugar in the gum solution. Then cook the mixture in a vessel suspended in boiling water, until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by dropping in a lump of gum camphor, or a little oil of cloves or sassafras. This cement is very strong indeed, and will stick perfectly to glazed surfaces, and is good to repair broken rocks, minerals, or fossils.—*Indiarubber Journal.*

"NATIVE GUANO"

is one of the manures competing for public favour in our market. Messrs. W. H. Davies & Co. advertise it as

A safe and Reliable Fertilizer for Tea, Coffee, Coconut Trees, Potatoes and Kitchen Garden Produce, Grape Vines, Fruit Trees, Tomatoes, Roses, Lawns, Chrysanthemums, Pot Plants, &c.

and from a pamphlet of testimonials by British farmers, orchardists and gardeners which has reached us from the firm named, it seems fully to deserve this character. It is prepared from sewage by the Native Guano Company, Limited, London, Kingston-on-Thames and Aylesbury. In the English pamphlet sent to us by Messrs. W. H. Davies & Co. for notice, we observe that the

Price at the works at Kingston, (Surrey), or Aylesbury, (Bucks), is £3 10s per ton, in 2 cwt. bags. Orders not exceeding 10 cwt. are charged at the rate of £4 per ton. Carriage paid within 100 miles of Works on Cash orders of 2 tons and upwards. A single cwt. Sample bag sent, carriage paid, to any Railway Station in England on receipt of Postal Order for 5s.

Even allowing for the depreciation of the rupee, the local price of R110 per ton, delivered at the raiway station, Colombo, seems high, especially in view of the fact that ground bones and white castor cake can be obtained for as nearly as possible half the money. The justification of the high price must be sought for in the greater richness of the Native Guano in active fertilizing qualities. We find Dr. C. Meynott Tidy and Professor Dewar reporting on the substance thus:—

"The percentage of combined nitrogen in the manure is consequently remarkably constant, and amounts to an average of 3·8 per cent reckoned as ammonia in the perfectly dry manure, or if with 20 per cent of water to 3 per cent of available ammonia."

The analysts add:—

"As the phosphoric acid is also an important ingredient from a manurial point of view, it was estimated in four samples of the manure taken from different parts of the heap, an average of 5·0 per cent reckoned as tricalcic phosphate of lime being found. As to the manurial value of the Native Guano, we are strongly of opinion that this must be judged rather by the practical results of the agriculturist than by presumed theoretical values based on analytical data, and on the price of ingredient not necessarily in the same physical or chemical condition. Recent research tends to show that very small changes brought about in soils may have very important indirect effects."

The Company themselves state:—

"The Guano is dry, inodorous, and its fertilizing properties are great. It contains nitrogenous matter as well as phosphates, alkaline salts, saponaceous compounds, &c., and has a combination of manurial elements in such proportions as suits the crops, and produces satisfactory results, fully bearing out the following opinions of Baron Liebig:—

"In the solid and liquid excrements of men and animals, we restore to our fields the ashes of the plants which served to nourish those animals."—*Liebig's Chemistry of Agriculture and Physiology, Page 180, 4th Edition.*"

"It is of great importance for agriculture to know with certainty that the supply of ammonia is unnecessary for most of our cultivated plants, and that it may be even superfluous, if only the soil contains a sufficient supply of mineral food of the plants when the ammonia required for their development will be furnished by the atmosphere. It is also important to know that the rule usually adopted in France and in Germany of estimating the value of a manure according to the amount of its nitrogen is quite fallacious, and that its value does not stand in proportion to its nitrogen."—*Liebig's Chemistry of Agriculture and Physiology, Page 212, 4th Edition.*"

We are, therefore, led to infer that the value of the manure is not to be judged by the proportions of nitrogen and phosphoric acid shown by analysis (potash is not separately specified) but by the general combination of manurial elements and their potent action on soils and on plant growth. Appeal is made to the long list of testimonials received as to the results obtained by those who tried the manure on widely varying products, such as cereals, roots, fruits and flowers; and certainly a large proportion of the testimony is unqualified as to the valuable effects of the preparation. It not only promotes the growth of vegetation and the formation of fruit, grain and roots, but it is described as "an effectual remedy for fly, slug, wireworm and garden pests." It may be applied advantageously to wet soil, as liquid manure, or with its own bulk of fine earth. So applied, its effects were as follows:—"Only a cottager," having by its aid obtained very good potatoes, good onions and splendid turnips, describes it as a very cheap and durable manure. A gardener testified:—

Used for cucumbers, melons, tomatoes, vegetables and pot plants in general. Results: very good. Tomatoes, cucumbers, celery grown entirely without any other manure have turned out excellent. I added about 1 lb. of Guano to 1 bushel of pure loam for tomatoes, and top dressed them afterwards at intervals of a fortnight with a fair sprinkling of Guano mixed with fine soil. The result was an enormous crop; quite surprised many gardeners in this neighbourhood.

Another:—

Used for cauliflowers, spring cabbage, carrots, radishes, onions, Brusses sprouts, and vegetables generally, also for flowers. Results: very good and satisfactory. I have had this garden 10 years, but never had such crops before. My neighbours speak well of it.

Another reports splendid crops and that the guano produced much finer crops than those grown with stable manure. To quote again:—

I have only used your manure for pot plants at present, and, so far, I am in every way satisfied with it. I use it mixed with the potting soil, and in liquid form for watering. In this it has a great advantage in settling quickly, enabling one to use it as soon as mixed. I have used other manures, but never had such results as from this.

Finally a Scotch testimonial:—

The Native Guano was used here for turnips, the field being dressed with farm yard dung in the autumn and ploughed in the spring. Part of the field was sown in the drill with Native Guano at the rate of 10 cwt per acre, costing £4 per ton, and part of it sown in the same manner with other Guano at the rate of five cwt. per acre, costing £10 10s a ton. The turnips on the ground dressed with Native Guano being a *better* crop than that done with the other Guano, considers the Native Guano a very useful manure for all kinds of farm crops. The soil here heavy coarse clay.

Messrs. W. H. Davies & Co., tell us they are supplying the Native Guano for tea and cacao as well as for garden produce; and we presume the results have been satisfactory. For estate purposes as well as for fruit orchards, vegetable gardens and grass lawns and pasturage, the substance certainly deserves a trial. To facilitate this, Messrs. W. H. Davies & Co. indicate that they supply sample casks containing about 190 lb. at R10 each. Meantime it would be interesting and useful to have the testimony of those who may already have tried the Native Guano (native to Britain), because in such reports there may be encouragement not only for the use of the manure imported and sold by Messrs W. H. Davies & Co., but for the ultimate formation of a local company to prepare really native guano from the sewage of Colombo and our other larger towns. The Chinese are far before more civilized races in their careful conservation

of manurial matter and its return to the soil. The difficulty is to retain manurial matter in an active condition and yet inodorous, and in this respect the Native Guano Company seem to have been successful.

CULTIVATION OF INDIARUBBER.

In *Nature* of January 15, in a note on p. 355, a statement is quoted, to the effect that some few attempts have been made to cultivate indiarubber, but as yet not very successfully. As, however, there are extensive flourishing plantations of *Ficus elastica* in Assam, a short account of their origin and present condition may prove interesting.

After some preliminary experiments on a small scale, the Government of Assam in 1873 determined to plant caoutchouc in the Charduar Forest at the foot of the Himalayas, north of Tezpur. Mr. Gustav Mann, the Conservator of Forests, gave me the necessary instructions to start the work in November of that year, and I remained in charge of the plantation till September 1875. The Charduar Forest has an essentially damp climate, the average rainfall at the caoutchouc plantation having been 94·65 inches during the years 1878—85, and during 1886—89, the annual rainfall was distributed as follows :—

Winter Rainfall.	1886-87.	1887-88	1888-89
November till March...Inches	4·87	7·38	4·78
Summer Rainfall	1886·	1887.	1888.
April till October... „	99·30	71·55	82·39
Total ... „	104·17	78·93	87·17

Data for the temperature of the Charduar Forest are not available, but the following average figures for ten years, for Sibsagar, which lies to the south-east of Tezpur, across the Brahmaputra River, will give sufficiently approximate results :—

Average annual temperature ... ... 73°·4 F.
Average monthly for January (lowest)... 59°·0 F.
Average monthly for July (highest) ... 83°·7 F.

The absolute maximum and minimum temperatures for Sibsagar are not given in the meteorological tables from which the above figures are taken, but quoting from memory, they are for Tezpur about 95° and 42° respectively.

The relative humidity for Sibsagar averages 83 per cent., being lowest in March, 79 per cent., and highest in January, September, and December, at 85 per cent. It is certainly not less than this in the Charduar Forest, where the moist hot atmosphere in the summer months resembles that of a forcing house. The Charduar Forest contains a vast number of woody species, both evergreen and deciduous, but chiefly the former, nearly pure woods of *Mesua ferrea* and *Altingia excelsa* prevail in the higher parts of the forest, and the undergrowth consists of dwarf palms, small bamboos, and evergreen shrubs, *Caffea bengalensis* being abundant in places, whilst cane palms are found in the damper parts of the forests, and festoon the trees in company with other huge climbers. A few enormous old rubber-trees are disseminated here and there throughout the forest. *Ficus elastica* has here been measured 129 feet high, with a girth around the principal aërial roots of 138 feet, whilst the girth of its crown was 611 feet.

As rubber-trees cannot stand shade, and the seedlings damp off unless fully exposed to light and well drained, the natural reproduction of *Ficus elastica* generally takes place in the forks of stag-headed or lightly foliaged trees high up in the crown, where seeds are left by birds; and from such a site the aërial roots in process of time descend to the ground, and develop into a vast hollow cylinder around the foster stem, which is speedily inclosed and completely killed by the vigorous crown of the epiphyte, which eventually replaces it in the forest. In its epiphytic growth, the aërial roots of *Ficus elastica* may take several years to reach the ground, but, once well rooted, nothing can probably surpass it in its native habitat for rapidity of growth and vigour.

As, owing to the above mode of growth, rubber trees are so sparsely scattered in the Assam forests, and it is therefore extremely difficult to protect them from being tapped in a wasteful manner, the plan of concentrating them in artificial plantations, as proposed to the Government by Mr. Mann, was carried out as follows :—

At first, attempts were made to propagate by cuttings, which struck readily, but it was soon discovered that rubber-seed germinates freely on well-drained beds covered with powdered charcoal or brick-dust, and that the seedlings, though at first small as cress, grew rapidly, and became about 2 feet high in twelve months, and were much hardier against drought than plants produced from cuttings. The base of the stem of the seedlings swells out like a carrot, and this fact, no doubt, enables them to tide through the dry season in safety, for, in spite of the humidity of the air, the nearly constant sunshine from November till March is trying to young plants.

In order to imitate nature as much as possible, some strong seedling rubber-plants were placed in the forks of trees in 1874, and by 1885 only a few of them had reached the ground and were growing most vigorously.

As this method, though much more economical than planting on the ground, gave such slow results, and it was found easy to produce plants in any quantity from seed, large nurseries were formed, in which the plants are now retained until they are 10 feet high, as smaller plants were browsed down by deer when planted out in the forest. The planting lines are cleared to a breadth of 40 feet in strips, separated by alternating strips of untouched forest 60 feet wide.

It was found that the rubber-plants did not get sufficient light with lines less than 40 feet broad, whilst the strips of forest kept the soil and atmosphere moist, and afforded side shelter to the plants, forcing them to grow upwards, instead of branching out near the ground. As this method involves considerable expense in clearing the lines, and wastes the wood, which is frequently unsaleable, Colonel, now General Keatinge, the Chief Commissioner of Assam, in 1874, directed that plantations of *Ficus elastica* should also be made in grass-land near Tezpur. It has been, however, found that large rubber-trees in Tezpur, when tapped, yield scarcely any rubber, the difference between them and the rubber-trees of the Charduar Forest being probably due to the greater dampness of the atmosphere and soil in the latter locality, as compared with the Brahmaputra Valley.

An area only of 8 acres was therefore planted out near Tezpur, whilst the area of the Charduar plantation in 1889, was 1,106 acres, and contained 16,054 plants, besides large nurseries with 84,000 seedlings.

Local Governments in India, which have to find funds for all sorts of administrative purposes, are naturally inclined to economize, and Sir Charles Eliot, when Chief Commissioner of Assam, about ten years ago, proposed to stop further work on the Charduar plantation, but this was vigorously opposed by Dr. Schlich, the Inspector-General of Forests, and at his advice, the Government of India directed the further extension of the plantation. Apparently, however, little progress was made between 1881 and 1888, when an additional area of 63 acres was planted up. Regarding the growth of the plants, the following figures, taken from Mr. Mann's report on the Assam forest administration for 1888-89, give the average height and girth, up to April 1889, of 50 trees in each year's planting :—

Year when planted.	Average. Height. ft. in.	Average. Girth. ft. in.	Growth since last year. Height. ft. in.	Growth since last year. Girth. ft. in.
1874-75	61 11	11 5	6 1	0 9
1875-76	57 6	7 10	5 2	0 6
1876-77	55 10	7 5	3 7	0 6
1877-78	53 9	5 11	5 3	0 7
1878-79	46 2	4 6	4 0	0 5
1879-80	44 10	5 2	5 9	1 2
1880-81	38 7	4 2	6 7	0 8

Thus, we see that the present average annual growth in height and girth, taken from 350 plants, are respectively 5 feet 2 inches and 8 inches.

In the small Tezpur plantation, where there are now 794 plants, all of 1874, the average height and girth are 47 feet 3 inches and 10 feet 10 inches respectively, the average growth in one year being 4 feet 4 inches in height.

The up-keep of the plantation consists chiefly in clearing the lines round the plants, but four years after planting the undergrowth is well kept down by the shade of the rubber-trees.

Experimental tappings were made in 1883 and 1884 on 50 natural grown rubber-trees in the Charduar Forest, the total yield being 438 pounds in 1883, and 206 pounds in 1884, giving an average yearly yield of 6½ pounds per tree. Further information regarding the yield of rubber from trees in the Assam forests would doubtless be procurable from the Assam Forest Office, as well as statistics of the cost of the plantations, which are not given in the papers at present before me. W. R. FISHER.

—*Nature*. Cooper's Hill College, February 18.

COTTON AT WATTEGAMA.

Sir,—I was interested in your article appearing in this morning's paper on the cotton enterprize.

I have recently had the pleasure of visiting Captain Gwatkin's Estate at Wattegama where he has planted over 200 acres of cotton, meant principally as shade for cocoa. Most of this cotton is from New Orleans seed with a sprinkling of Sea Island. The greater part was planted towards the end of September last, and during the month of February 19,000 lb. of seed cotton was taken from the trees, worth about 7 cents. per lb. Picking was continued this month at about the same rate until the rains came, when the plants began to throw out leaves and fresh blossom.

If the rain will now cease there must be another heavy crop during April and May, and probably a heavier crop after the S. W. Monsoon. This cotton has had the advantage of land thoroughly cleaned and kept weeded. Captain Gwatkin has done everything thoroughly well, and he will be well repaid. He has a large-sized double acting knife roller gin with engine, and is doing his own ginning. The Spinning and Weaving Co. has bought the whole crop, and the seed is being sold in the district for R3 per cwt.

The cotton is beautifully clean and free from stains; and is in every way a credit to the grower and the district.

I am sure European Planters would find it worth while to grow cotton for shade. It grows very quickly and gives quick returns.

For natives it ought to be very suitable, but for them I should recommend the Kidney kind if seed could be obtained. It will grow almost anywhere, is hardy, bears well, and is perennial. The Spinning and Weaving Co. can buy all clean cotton grown either from America, Kidney or Egyptian seed. The Sea Island kind is too long in the staple for our use, and unless specially fine and regular in length and colour does not sell well in England.

Yours faithfully,

Colombo, March 18th 1891. H. ATKINSON.

—Local "Independent."

LONGEVITY OF TEA.—It is interesting to be reminded that Chinese tea "crofters" or gardeners regard their tea bushes even when a hundred years old or over, as still far from being beyond bearing. Many of them say that tea never requires renewal but will go on, like Tennyson's brook, "for ever."

TEA IN UVA.—A Dimbula planter who has been visiting Uva is loud in praise of the splendid growth of tea and especially the fine widespreading bushes he saw in Haputale and Badulla districts. The plucking surface on individual bushes will, he thinks, be much larger in Uva as a rule than elsewhere in Ceylon.

STRUCTURE AS A GUIDE TO CULTIVATORS OF PALMS.

We have been favoured with a note on the structure of Palms in relation to their cultural requirements, which orginally appeared in the *Bulletin della R. Societa Toscana di Orticultura*, and which is amply worth bringing before our readers:

"Italy is one among the few States of Europe which, by virtue of its climatic conditions, has been able to extend hospitality to a very considerable number of species of that princely family—the Palm. With the dwarf indigenous form (Chamærops humilis, L.), there has been associated for centuries the majestic Phœnix dactylifera, L., but it is only during the last decade that, through the general march of horticulture and the special efforts of enthusiastic amateurs, about 40 species have been successfully introduced into those localities specially favoured by nature with mildness of climate. The Italian horticulturist cannot find greater satisfaction than in carefully and intelligently studying the requirements of this plant, in order that he may treat them in a suitable manner. Let us begin by observing the Date-palm (Phœnix dactylifera, L.). A well-known Arab saying gives briefly the requrements for Date-palm culture in the words, 'Feet in the water, the head in the fire.'

"If we substitute sunshine for fire, we may, to be consistent, render water as moist soil, especially since this Palm is certainly no aquatic plant, but, on the contrary, suffers from excess of moisture at the root, unless the soil be naturally porous and sandy. From this we might proceed to argue that a moist soil is indispensable to the life of the Date Palm, but this conclusion is far from being in accordance with our knowledge of the facts. We find rather in the Phœnix dactylifera, as in many other plants long acclimatised, a capacity to adapt itself to diverse circumstances, in which it may have been forced to live, provided only that the temperature permit (minimum 25° to 26° Fahr., *i.e.*, 6° to 7° frost) modifying its structure according to the local conditions. Examining the structure of its leaves, we find that these are in every part so constructed as to receive, hold, and conduct to the stem the atmospheric moisture which falls upon them in the form of dew or rain. In fact, it may be observed that every leaflet adhering to the rachis is moulded to the form of a V-shaped channel, in which a film of dew, however thin, concentrates itself in drops, which, arriving at the base of the leaflet (furnished with a gland probably able to absorb a minute quantity of water) find their way down the leaf to the trunk. The leaf itself is provided with shallow flutings, both upon its upper and its lower surfaces, by which more or less quickly (according to the inclination) they again discharge themselves upon the trunk. The dense fibrous coat which clothes the stem is designed for three distinct functions, viz., to defend the young leaves against inclemency of the weather; to shield the trunk not yet arrived at the indurated stage from bruises; and finally to absorb and retain the water received from the leaves to the furtherance of vegetation throughout the plant.

"A phenomenon most deserving of attention on dewy mornings is the appearance of sparkling drops chasing one another down the leaves towards the centre of the plant, so that the thick web upon the trunk becomes perfectly saturated with moisture, whereas the bark of other trees remains almost completely dry. This faculty of appropriation of moisture from the air explains why the Date Palm—which might be called a 'dew-funnel'—can grow in places deficient in water, so far as the soil is concerned. The inner layer of fibre becomes rotten, little by little, owing to the presence of the water introduced by the leaves, becoming thus reduced to vegetable mould, which is kept in its place by the exterior web or fibres yet remaining intact, and also, indeed, by the dried leaves which hang from the stem. To this mould, formed out of the fibre of the plant itself,

is added sand carried by the wind. By means of this atmospheric agency and that of birds, seeds of small plants are very often introduced, which, by growing as well as possible, under the circumstances, increase the bulk of earth around the trunk.

"In time of drought, the Palm, not deriving sufficient nourishment from its terrestrial roots, will put forth aërial ones numerous enough to sustain itself with the assistance of this humus and the nightly dews.

"Glancing now at the other kinds of Palm, *e.g.*, genus Cocos, we find very different—I may say entirely opposite—characteristics. In these everything indicates their absolute dependence upon the soil in which they live. In truth, their leaflets and their rachides instead of being conduit-shaped, V, as in Phœnix dactylifera, are the very reverse—convex, or fashioned like a roofing tile, Λ, in such a manner that rainwater and dew fall from them to the ground. The sparse fibrous material at the base of these leaves evidently serves only for resistance or the defence of the leaves against impetuous winds. Furthermore their stems are not capable of putting forth aërial roots, as is the case with the Date Palm."—L. Winter, Bordighera.—*Gardeners' Chronicle.*

TEA AND COFFEE SUBSTITUTES.

(*Continued from page 674*).

Caprifoliaceæ.

40. *Triosteum perfoliatum*, L.—An herbaceous plant of North America, where it is known as wild coffee, fever root, or wild Ipecacuanha. The hard seeds when roasted and ground are said to be a good substitute for coffee,

41. *Viburnum dilatatum*, Thunb.—This plant was first noticed as the source of a peculiar kind of tea in a report in 1885 by Mr, Alexander Hosie, of a journey through Central Tsu-ch'uan. It was noticed in a communication by myself to the *Gardeners' Chronicle* for September 26, 1885, p. 402, and to make these notes more complete, I reproduce it here. Referring to the discovery of this tea by Mr. Baber, Mr Hosie says, "If my memory is not at fault, he (Mr Baber) was regaled by a priest on Mount O-mei, with tea possessing both the flavour of milk and sugar. It may have been in the very Temple on the mountain's side, in which I am now writing, that Mr. Baber was agreeably surprised. At any rate, I am sipping an infusion, which is, without doubt, sweet, and which is declared by the priest to be brewed from a naturally-prepared tea-leaf. It is a large dark-brown leaf, and is very sweet when chewed. The people at the bottom of the mountain, whom I first questioned regarding this tea, asserted that the leaves were sweet because they were first steeped in molasses; but the balances of evidence, as I have since found from extensive enquiry, is against such artificial preparation. The tree is said to grow in only one gorge on the mountain, whence the leaves are brought for sale." We are indebted to Mr. Hosie for a sample of this tea, which consists of the entire leaf rolled up loosely into little balls, and almost black in colour. Upon chewing a portion of a leaf, it was found to be decidedly sweet, with a strong suspicion of liquorice rather than molassos, as stated by Mr. Hosie. Upon soaking the leaves and flattening them out, they were found to be those of Viburnum dilatatum, Thumb. To prove that the leaves of this plant possessed no natural sweetness, we obtained a few leaves from a growing plant and dried them, and found that neither in their fresh, and still less in their dried state, have they any marked flavour. Moreover, the leaves of the Mount O-mei Tea are transparent, as if they had been steeped in some solution, while those which I gathered and dried are opaque, and yet retain their green colour. It seems certain, then, that this singular tea owes its sweetness to some foreign substance, as stated by "the people at the bottom of the mountain, and that substance may be molasses, but is in all probablity liquorice."

Rubiaceæ.

42. *Oxyanthus Gerrardii*, Loud—Under the name of Wild Coffee from Natal, there are some fruits of this plant in tho Kew Museum. These fruits are about the size of a Coffee berry, and contain about six hard brown seeds, somewhat resembling in size and appearance a small shrivel'ed sweat Pea. They are, however, horny, like the true coffee, and upon roasting give off a burnt-like odour; this, however, might be more fragrant if carefully done in a closed and revolving vessel, and considering that the plant is a near ally to the true coffee, it might perhaps be made a useful substitute.

43. *Diplospora Sphærocarpa*, Datz —A small Indian tree of the Western Peninsula or the Western Ghats, from Bombay southward. It seems to be known as Jungle Coffee in Ootacamund, and the fruits, which in shape and size are like a coffee berry, contains a number of small seeds, which upon roasting develop a strong aroma like coffee, and when ground can scarcely be distinguished from genuine coffee. Samples of fruits and the prepared coffee are shown in tho Kew Museum.—John R. Jackson, Museum, Kew.—*Gardeners' Chronicle.*

Our Labour Supply.—We confess to greater anxiety than we felt at the opening of the year as to a sufficient supply of labour for our growing tea industry. The news of distress in Southern India made us then feel sure that Ceylon would be favoured with a large influx of coolies and that the usual flow back would be very much diminished. But the very latest return, that up to the end of February last, shows no fewer than 10,007 departures against only 6,545 arrivals, and from different planting districts come complaints of "crimping," unsettlement of Kanganies, &c., sure signs of labour being in keen request. One explanation given of coolies not coming to Ceylon so freely as was expected is that they are now leaving Southern India for other countries—Burma, The Straits, West Indies &c.—far more freely than they used to do. This is a point on which the Planters' Association might well make enquiry.

Tea Transport and Final Tea Preparation near Colombo.—Our planting "Visitor" propounded an idea in his letter [see page 725] which is enough to frighten Mr. Pearce out of his propriety,—to make

—each particular hair to stand on end,
Like quills upon tho fretful porcupine !

It is nothing less than that the carriage by rail upcountry of tea-boxes, hoop-iron, lead-lining, and all the etceteras, including a great deal of machinery, should be dispensed with ! [What would become of the railway revenue then ?] And that tea in a semi-prepared state should be forwarded in air-tight bags to the vicinity of Colombo—some of our stores, at any rate, are supposed to be too much under the influence of sea air—and there finally prepared with a refiring and then packed in the boxes for despatch to England. Thousands of men, women and children in the Colombo district, would rejoice in the revival of a Preparing and Packing Industry of this kind, and the division of labour might no doubt, be a great relief to harassed estate managers upcountry, especially at a time when labour is by no means too plentiful. But we much fear the realization of "Visitor's" thought, is still far off. An experiment to some extent in sending down tea leaf by rail to a Colombo store has been tried, but with results not encouraging to any extension of the business. The case might be different with partially prepared tea in air-tight bags, and at any rate there can be no harm in making a trial, *malgré* the General Manager !

Correspondence.

To the Editor.

COFFEE FREE FROM DISEASE: SHOULD SEED BE GOT FOR CEYLON?

Sydney, New South Wales, March 2.

Dear Sir,—I have just read a paragraph in your *Overland Observer* of 5th Feb. on the "Revival of Coffee" (in Ceylon); and thinking it might be of value to those about to plant coffee again and knowing the interest you take in such matters, I venture to state that I have seen in my travels since I left Ceylon, twelve months ago, fine healthy Liberian coffee trees, untopped and bearing a large crop, grown in a country absolutely free from leaf disease. I have as well seen *Coffea arabica*, where there is no disease of any kind, *Hemileia vastatrix* included, and I would be obliged if you would let me know if seed from such trees would be required in Ceylon, as I can, I believe procure some; at the same time would be glad to know the best means of packing the seed as they would be perhaps five weeks in transit.—Yours faithfully, C. P. ATKINSON.

[As Mr. Atkinson is returning to Ceylon in April, there can certainly be no harm in his bringing some of the coffee seed he refers to—though we should not recommend his investing in much. It should be packed in charcoal. Seed from coffee trees free of disease—Mocha and Liberian—was freely imported into Ceylon in the "seventies," by Capt. Bayley among others; but the resulting plants were at once covered with *Hemileia vastatrix*.—Ed. *T.A.*]

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, March 10th.

Dear Sir,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 23rd February 1891:—

Exports of Indian Tea From Calcutta.

	1891 lb.	1890 lb.	1889 lb.
Exports to Great Britain in Feb.	3,988,534	5,833,908	4,433,555
Exports to Great Britain from 1st May to 28th Feb.	96,944,877	94,963,710	91,260,140
Exports to Australia and New Zealand in Feb. ...	203,47	177,049	105,765
Exports to Australia and New Zealand from 1st May to 28th Feb. ...	4,548,267	3,382,011	2,856,538
Exports to America in Feb.	13,152	212	12,375
Exports to America from 1st May to 28th Feb. ...	131,662	164,697	155,784
Exports to other places in Feb.	113,511	62,034	97,256
Exports to other places from 1st May to 28th Feb.	1,021,276	1,392,004	854,978
Total Exports from 1st May to 28th Feb. ...	102,709,829	99,902,422	95,127,440

—Yours faithfully, S. E. J. CLARKE, Secretary.

SALT FOR AGRICULTURAL PURPOSES: In Coconut Cultivation Especially.

Veyangoda, March 12th.

Dear Sir,—I mean this to be an appeal to the daily newspapers to help me to secure for the agriculturist salt on special terms. I may mention at the outsett that I am not personally interested in the subject My interest in it is indirect. My objects are (1) to benefit Agriculture; (2) the revenue.

Before I proceed to discuss the subject, it is necessary to say that it was discussed *ad nauseam* about a couple of years ago, when I started it. The then Governor or his advisers did not seem inclined to make the concession prayed for. My reviving it so soon after will, I trust, be looked upon as a measure of my earnestness on the subject, of my belief, by the light of experience and observation, of its very great value in agriculture under certain circumstances, and of my determination to do what I can to obtain the concession from the Government.

Of the value of salt in agriculture there are no two questions. On its value in coconut cultivation it would be absurd to dilate. But I am forced to it, as those who joined in the discussion when I started it before, taking their stand on works on Agricultural Chemistry which treat chiefly on the cultivation of roots, grasses and cereals in European countries, argued that as these state that the small quantity of salt discovered in the ashes of plants is invariably conveyed to the soil by natural agencies, therefore it is absurd to say that, in our little island, swept as it is by both monsoons, there can be an insufficiency of salt in the soil, and this argument is extended to inland districts under *coconut cultivation*, where, it is contended, it is not necessary to supply salt by artificial means! Arguments such as these can be used only by those who blindly follow the dicta of science, without adapting them to varying circumstances.

As we all know, the home of the coconut palm is where the "sad sea waves" break at its very roots. Without entering on the vexed question as to whether the East or the West is the original home of the palm, I may state, what everyone will accede to, that the natural home of the plant is by the sea shore, and that its extension to uninhabited coasts was by the agency of waves and currents. Its cultivation inland was the work of man.

Let us now examine the natural conditions under which the palm grows and aye, flourishes. It grows on a perfectly free soil through which the roots roam unrestricted in search of food and water; (2) in situation where the downward roots have a perennial supply of water; (3) in a soil impregnated with salt; and (4) in an atmosphere saturated with saline spray. Now we all know, or at least ought to know, that in cultivating a plant or tree we ought, as far as lies in our power, to conform in everything to the natural conditions under which it grows, if we wish to cultivate it successfully. Of course, it is not always possible to conform in every particular with its natural requirements; but the process by which trees or plants adapt themselves to their surroundings is a slow one and by no means violent. In process of time a tree can be made to grow under conditions which to it are unnatural, but not all at once.

When the cultivation of coconuts was first undertaken in this island, it was on the seashore. It was gradually extended inland, but on the seaborde where the four natural conditions I enumerated existed, though in a modified degree, but where the soil being chiefly alluvial was far richer than on the almost pure sand of the sea-shore. As the low-lying lands on the seaborde became exhausted, the cultivation was carried further and further inland, till at the present time coconuts are cultivated under conditions which do not conform in any one particular with the natural conditions under which it grows It is cultivated in stiff clays, gravels and cabooks, where water is seldom or never within reach of the downward roots, and where neither the soil nor the atmosphere is largely charged with salt.

That the coconut tree resents the gross violation of its requirements, all will agree who will intelligently compare trees as they grow, say in Colombo, and as they are grown even in the most highly favoured districts inland. For a comparison to be of any value, it must be made between trees growing on soil of equal richness. But if it be made between trees growing on rich and poor soils, and if it be in favour of the latter, then we may well stay to inquire the reason why. I think it will be admitted on all sides that the soil of the Cinnamon Gardens at Colombo is about the poorest, if not the poorest, to be met with

in the neighbourhood. It is what is described as a hungry soil, is very poor in organic matter, and owing to its composition has very little retentive or capillary powers. And in many parts of the Cinnamon Gardens a layer of hard sandstone underlies the sand at a few feet depth, and has to be broken through to make holes for plants to be put down. A comparison between trees growing on such a soil, with those growing generally in the most highly favoured of inland districts will therefore be a crucial one. I have a tolerable acquaintance with the inland districts where coconuts grow, and I think have visited all, if not nearly all, the crack estates. As a result of very close and careful observation, I unhesitatingly say that, taken as a whole, the trees in the Cinnamon Gardens are, for habits of growth and productiveness, superior to those in the best inland districts I have visited.

It will be useful to enquire into the reason for this, but the results will be purely inferential, for unfortunately I cannot lay claim to any but the most rudimentary acquaintance with the principles of Agricultural Chemistry. But I do lay claim to the close observation which I have brought to bear on a tolerable knowledge of practical agriculture. To be concise; I think the reason for this is to be found in the fact that in the Cinnamon Gardens, an exact counterpart of two of the natural conditions under which coconuts grow is to be met within a free soil and easy access of the roots to water, while the atmosphere and soil of the Cinnamon Gardens can never be wholly devoid of salt, and in the S.-W. monsoon months must be charged with it. This is the inference I draw from a comparison of the growth and habits of the trees in the poor sandy soil of the Cinnamon Gardens with those grown in the rich, and in some instances, alluvial soil inland.

Abundance of moisture plays an important part in the economy of the coconut palm. The palm is a huge pumping machine for sending up water for the formation and development of its nuts. An examination of the roots will show how admirably adapted they are for this purpose. The trunk too is a soft spongy mass reeking with moisture. An examination of the fronds and their disposition will show that nature intended them to act as so many ducts to catch and carry rain water down the stem to the roots. It ought, therefore, to be the aim of the skilful agriculturist, whenever coconuts are grown in situations where moistures does not abound, to aid nature to obtain the necessary moisture.

As I said more than once before, the habits of trees grown in the inland districts are quite different from those growing on the seaborde. The most noticeable is their inability to support their bunches of fruits without artificial aid. Props to support bunches are the exception on the seaborde, but the rule inland. Bunches, however small they may be, invariably snap at the stem if not propped up when the nuts are a few months old. This till the trees arrive at maturity at 20 years of age and over. What is the reason for this? I hazarded the guess that it may be owing to a deficiency of silica, for that constituent is necessary to stiffen all forms of vegetation. Against this has been triumphantly quoted recent experiments of cereals grown in soils devoid of silica and yet having their stems stiff. I cannot see how these experiments affect the question at issue. In the same way that earthy matter imparts to bones their hardness, so does silica to vegetable matter. It toughens and strengthens vegetable tissues, and remember the strain the stem of a coconut bunch has to bear is infinitely more, proportionately, than that of the stem of cereals. A young coconut weighs from 10 to 15 lb. and bunches with 10 to 20 nuts are not exceptional. A simple sum in multiplication will at once give us an idea of the weight the stem of a bunch has to support. I will not anticipate what I will say hereafter by mentioning how the supply of silicates can be increased. Another bad habit of coconut trees grown inland, is their inability to support their fronds as soon as dry weather sets in. This may be due as much to deficiency of silica, as it undoubtedly is to an insufficiency of moisture, to the balance between evaporation at the leaves and absorption at the roots being disturbed. At this season of the year, the drooping of branches and the dropping of nuts inland is usual. An old Sinhalese man lately mentioned to me, as proof of the severity of the drought recently on the seahorde, the dropping of nuts from old trees, a circumstance not within his experience previously. This is not uncommon inland, and is instanced to prove how important water is to the coconut tree.

These remarks, for the length of which I apologize, are introductory to my subject, which I shall treat of in a future communication. Till then I crave a suspension of editorial comment.—Yours truly, B.

THE ADVERTISEMENT FOR CEYLON TEA THROUGH GARTMORE TEA SELLING AT £10 12s 6d PER LB.

London, E.C., March 13th.

DEAR SIR,—You will see by our circular the remarkable price (£10 12s 6d per lb.) we realized at public auction for a little lot of Gartmore tea. We send you cuttings from the London press on the subject as they may interest your readers and show how much good is done to Ceylon tea by the attention of the public being called to the splendid quality that can be produced if they are willing to pay something over the usual 1s 8d per lb. to 2s per lb.—We are, dear sir, yours faithfully,

GOW, WILSON & STANTON.

In addition to the *Times* from which a quotation was made in our London Letter on Monday, the other leading newspapers in London have published articles referring to the extraodinarily high price of £10 12s 6d per lb. realised at the recent sale of Gartmore tea in Mincing Lane. The *Daily News* alluding to the sale says:—"Probably never been heard of until yesterday even in the early days of the importation of the leaf; though, of course, if the difference in the value of money is considered, the apparently lower prices of the days when tea was at its dearest would be found to be in reality very much higher. The price ranged from 6*l* to 10*l* in these early days. When Garway wrote that tea, in respect of its scarceness and dearness, 'hath been only used as a regalia in high treatments and entertainments, and presents made thereof to princes and grandees,' it was sold to the public at from 15s to 50s a pound. The East India Company's presents of tea to Charles II. in 1664 cost them 50s. Quite recently some special tea was sold at only half-a-crown less than 5*l* a pound, and, on being resold at about 7*l*., was talked of as one of the marvels of the day. Now that a price of over ten guineas has been reached we may ask, are we on the eve of a repetition of the tulip mania, with tea instead of tulips as the craze."

In an article which appeared in the *Daily Telegraph* it is said:—"In the olden times connoisseurs paid fancy prices for rare vintages of port or claret. Nowadays the taste seems to have changed, and tea takes the place of wine in the high figures of the auction mart. Some days ago 'all the world wondered' when a pound of tea sold at a public sale for £4 7s 6d, but yesterday saw the same quantity of tea-leaf from Ceylon vended for more than double that sum. * * * * Should the value of the Eastern plant continue to advance by similar leaps and bounds, a tiny cup of tea may soon be expected to form the rarest liqueur served at select City banquets."

The *Daily Oracle* records an interview on the subject of the sale from which we extract the following:—"This sample of tea sold was grown at a high altitude. Its purchasers are the Mazawattee Ceylon Tea Company. This company is attracting attention to the better class teas. People seem to have got into the idea that it is only necessary to pay from 1s 8d to 2s per lb. for tea. They cannot get the finest qualities at the price. Tea is actually sold in Mincing-lane in bond for much higher figures. A large quantity of tea is sold

in the Lane at from 1s 6 to 3s per lb. It is used for blending, so that the public do not get this finer tea pure at the lower rates. There is no doubt about the hold which Ceylon teas are obtaining on the popular taste, the Indian teas are also fetching as good prices in the market. I think the two teas go very much hand in hand so to speak. Of course, better Ceylon and Indian teas will be produced if planters are stimulated by more remunerative prices in the market. I don't suppose that such a price as we obtained yesterday can always be obtained. There is no doubt that better prices can be made. * * It is to the interest of the public as well as the planters that higher priced teas should come into the market. * * "It is an extraordinary thing to me, the way in which Ceylon and Indian teas have crept up, and China teas crept down. China not so long ago had the field all to herself. China teas, however, fell off in quality and into public disfavours. Ceylon teas have only been cultivated during the past 20 years, and Indian tea for not more than half a century. We do not sell China tea at all. We only sell the Ceylon and Indian teas, both of which possess intrinsic merit."

Comments also appear in the *Globe*, *Financial News* and *Daily Graphic*; and Messrs, Geo. White & Co. who are qualified to speak with some authority state in their India, Ceylon and Java Tea Memoranda:—"To avoid disappointment to future shippers of fancy lots it should be borne in mind that under ordinary circumstances such tea in larger quantities would probably not fetch tithe of price quoted.

Nature says:—"The tea ought to have very special qualities"; and the *Chemist and Druggist*, alluding to the sale as "the sensation of the week," observes —"This price which far exceeds that paid for the two previous lots, is, of course "fancy" one and has been conceded in all probability with a shrewd eye to advertising advantage. In quality the tea resembles the "golden tips" sold two or three months ago at what was then the highest price on record but it is rather brighter."

The London correspondent of the local "Times" has given the following account of the sale:—"The bidding mounted up by ten shillings in place of the usual farthing, and as each of these was proclaimed it was received with a burst of cheers which increased in volume as the former high record of £5 10s 6d was passed. By that time some of the buyers became less urgent, and when at length £8 was reached several dropped out of the running. Much amusement at this point was caused by a broker of rather nervous temperament who became so excited that, standing up on his chair, he became suddenly deadly pale as though about to faint, when acting by the ordinary sale rule of farthing bids, he found sufficient voice to cry a little above a whisper "eight pounds and a farthing"; which materially evoked shouts of laughter and which someone capped by a bid of "eight-ten," and so the bids went on until the unprecedented price of £10 12s 6d was reached, a bid which was received with rounds of cheering and shouts of laughter. The result of this sale was at once wired to New York; and by the following morning an order came back to secure a quarter of a pound of the precious article *at any price* a commission which I do not believe will be executed."

In a Leeds newspaper, the following appears:—"How very precious tea-growing land in Ceylon must be! A gold mine is nothing to the riches here inviting the cultivator who gets hold of the right soil, and has intelligence in the management of the plants and the garnering of the precious leaves. Recently a consignment of Ceylon tea was sold for something over £5 per pound, and was re-sold for more. The inflation of Ceylon qualities is by no means over, for yesterday (March 10th) in London a small sample of what we must presume was superb and incomparable tea fetched the astounding price of £10 12s 6d per pound! Tea of indescribable superiority is thus becoming almost worth its weight in gold. Nevertheless for ordinary people inherently deprived in taste, tea at from two to three shillings per pound is wonderously refreshing. The high-priced tea referred to may be considered cheap at three shillings per cup."

CACAO CULTIVATION.—STEALING NOT CONFINED TO KURUNEGALA.

Kandy, March 17.

DEAR SIR,—With reference to your footnote to my letter of 13th instant (see page 723) I think you are in error in suggesting that the Kurunegala District is the only one where cacao-stealing is general. What about Dumbara and Matale, where even the Buddhist priests have taken to the new industry?

As regards the returns from cacao cultivation, are we to conclude that a yield of 1½ cwt. per acre *in alternate years*, constitutes a big crop?—Yours faithfully PRÆDIAL PROGRESS.

[Are we safe in taking all the acreage as in full bearing and under proper shade cultivation?—ED. *T.A.*]

CACAO CULTIVATION: MR. HOLLOWAY'S EXPERIENCE.

Franklands, Wattegama, March 18th.

DEAR SIR,—I noticed lately a great deal has been written for and against cacao (Criollo, Forastero, and Caracas), especially "Eldorado" 's attack, and I have thought proper to test and prove that cacao does and will pay if carefully cultivated, even on soil condemned by would-be experts if you only know how to treat that soil, assist your plants with proper shade, and nourishment, and prune your trees at the proper time. When plucking on 11th inst. I selected 100 hybrid Forastero pods: they weighed 200½ lb. on evening of 12th when pods were broken up and put to ferment. On morning of 15th seed was washed, and was dried in good sun to 1 p. m. this day. Seed now weighs 12¾ lb.—204 oz. or—2 oz. to one pod; this takes 896 pods for one cwt. Some good old Forastero trees on this estate gave 100 pods each and are over five years old, averaging 2lb. each—same kind long pink pods as the 25 exhibited at the Matale Show from above estate two years ago. Plants from seed of selected pods from this estate supplied to and planted in a nursery on Ukkuwala estate, close to railway line, are now a picture to look at. The tamby just now offered to pay at the rate of R65 (sixty-five) per cwt. for this cacao. A sample of ½ lb. is sent by this post.* I firmly believe 200 to 300 pods per tree can be got from this variety of cacao trees after the 6th year with proper cultivation per annum.—Yours faithfully,

J. HOLLOWAY.

MR. HOLLOWAY'S CACAO FIGURES.

SIR,—I am not alone in my condemnation of the inferences Mr. Holloway would have us to draw from the figures given in a letter of his, published as recently as 20th inst.

He may, for all I know, be merely calling attention in an innocent way to the superiority of his cacao seed, but it is very undesirable that such inflated and preposterous reasoning should go unchallenged.

There are, I believe, about 300 cacao trees per acre on an average. Mr. Holloway gives figures showing his belief that a 6 year old tree will bear 200 to 300 pods, and that 896 pods go to 1 cwt. of dried seed worth now R65 per cwt!

I ask you in all commonsense not to allow any intending cultivator to be misled by such absurd statements issuing from anyone setting themselves up specially as cacao growers.

At the rates named above the yield of an acre of cacao would be above 100 cwt. and over R6,500 value per annum per acre. PLANTER.

* The sample, a very fine one, so far as we can judge, can be seen at our Office.—ED. *T. A.*

SALT IN AGRICULTURE: No. II.

Veyangoda, March 18th.

Dear Sir,—My excuse for prolixity in my previous communication, is that, in order to show that salt is indispensable in coconut cultivation, I thought it necessary to point out the natural habitat of the tree, the conditions under which it flourishes, and its habits.

In the generality of instances, trees grown inland have none of the natural conditions under which this palm grows. The results of this are self-evident to those engaged in its cultivation. How to overcome these should be their aim. To make a stiff soil free, is not as easy a job as those who glibly recommend its being broken up to the depth of 18 inches and limed imagine. The initial cost will be between R25 and R30 per acre. I should be happy to form the acquaintance of the man who will incur this over an appreciable acreage. Besides, to counteract the effects of sun and rain, and of the action of the feet of cattle, the work will have to be continuous. It is, I think far better to recommend something practicable than what, though highly desirable, will not be undertaken. Next, as to a plentiful supply of water. Unhappily, every coconut estate proprietor has not the energy, pluck, enterprise, or command of capital of an Akbar, even though many have the Mahaoya or other rivers skirting their estates. So that that, too, must be dismissed like the altering the mechanical condition of the soil, as being outside the pale of "practical politics." The salting of the soil is then the only operation left us, in the way of conforming with the natural conditions under which the coconut palm grows, and I say it is the most important. In low-lying flats inland, we meet with free sandy soil, having water within easy reach of the roots of coconut trees, and yet the trees growing on them have not the ability to carry their bunches unaided. We may well enquire how this is, seeing that in such situations two of the natural conditions under which the palm grows are present. I think the inevitable conclusion is an insufficiency of salt for its requirements.

Under the circumstances I have detailed at such great length, I call upon the gentlemen of the Press to make a united application to Government to issue salt for agricultural purposes at wholesale prices. Situated as I am away from Administration Reports, I cannot say precisely what wholesale prices are, but I believe they are somewhere about 40 cents per cwt. The cost of manufacture I believe is well within 25 cents per cwt.; so that the margin of profit is not to be despised, if Government can be induced to follow a liberal and progressive policy and encourage the use of salt extensively in agriculture, instead of as now standing stolidly in the way. Of course, safeguards against the revenue suffering would have to be adopted; but the devising of these will surely not be beyond the ingenuity of the legal advisers of the Government. It can be issued only to men of standing, or to those whose respectability can be vouched for by two men of standing. A declaration on honour will have to be given that the salt will be used exclusively for agricultural purposes, and an undertaking to pay a penalty representing the difference between the price it was issued at and retail price for the full quantity issued, if it be proved that, owing to the want of reasonable precautions, any part of it was used for culinary purposes. These are safeguards enough, but another and an indispensable one must be that, before issue, the salt be mixed with some offensive stuff like night-soil at the Government Store and under the supervision of its own Storekeeper, the latter to be supplied by the purchaser in proportions to be fixed upon by the Government. Every practical man who is intimately acquainted with the natives and their deep-rooted prejudices will agree that the last precaution will remove all chances of the salt being used for human consumption. Let not the Government harp on the well-worn string that it is possible to purify and render fit for consumption salt so treated. Let the Government, composed as it is of practical men, deal with probabilities and not possibilities.

To say that an increased consumption of salt will mean increased revenue, is to state an axiom. The increase will not be sudden, but it will be slow, till the benefits of salt in agriculture have been demonstrated. Then, there is the residual salt of the pans, which a glance at the Administration Reports of the Government Agent of the Northern Province and of the Assistant Government Agent of Puttalam will show is destroyed at a high cost. This cannot be characterized as other than a sinful waste of a useful article of consumption and of money. It has been established that this residual salt can, when mixed with bulky manures, be used as a manure. Why not save the money expended in its destruction and turn this substance into an item of revenue?

It will be necessary for me now to detail the value of salt in agriculture generally. In doing this, I will be forced to repeat all the information I collected at much trouble, and what has become available since.

Salt has a two-fold action on the soil, mechanical and chemical. Besides this it is hygrosorptive, and has a value all its own. By its property of absorbing the moisture of the atmosphere, it alters the texture of the soil, and always keeps it moist and free in dry weather. Chemically, it has the property of rendering soluble the Phosphates, Nitrates, Silicates and Potash in the soil. A sour soil is by its application rendered sweet, and the coarse herbage growing in it is rendered fit for cattle. Vegetable tissues are by its application rendered tough and stiff, possibly by the large quantity of silica it enables trees to take up as food. Though experiments have proved that plants can be grown in soils devoid of silica, yet silica is known to help plants to assimilate other plant food. Therein possibly lies the secret of the vigour it imparts to vegetation, and the reason it acts as a stimulant. The late Mr. Davidson, a coconut planter at Jaffna, who shows by his writings a considerable acquaintance with agricultural chemistry, wrote:—"Were I to say salt acts as a *stimulant*, I might state what I could not explain; but I could point to its operation in the animal economy as proof of its possessing properties adapting it peculiarly to a tree in which the ever-circulating sap is perpetually varying in constitution and density. We can then understand why the coconut tree thrives best when it feels the influence of the salt spray. By its ability to supply, or rather to absorb, moisture in dry weather, it helps greatly in proper nourishment and formation of fruit. It can be applied profitably in soils rich in organic matter. It operates on the soil with an influence not produced by any other stimulant, mineral or vegetable."

I think I have said enough to demonstrate its great value generally in agriculture, and of its indispensability in coconut cultivation inland. The Superintendent of the School of Agriculture and at least one of his Assistants have borne willing testimony to its value in agriculture, and have recommended its issue at reduced rates. It is now left only for the gentlemen of the fourth estate to formulate a united appeal to the Government, and for those interested in agriculture to back up that appeal, so as to induce the Government to abandon its dog-in-the-manger policy with regard to this question. By aiding agriculture in the way I have indicated, it will increase the revenue directly by the increased sale of salt, and indirectly by increasing the earnings of the salt manufacturers and of landed proprietors, thus increasing the circulation of capital.—Yours truly B.

HIGH PRICES FOR CEYLON COCOA.

Colombo, March 23rd.

Dear Sir,—A great deal has been said about a parcel of cocoa belonging to Mr. Payne having sold at R65 and another parcel of Mr. Barber's at R68, but I think if anybody has to be congratulated it is the proprietor of Wiharagame, whose cocoa I sold last week at R73 per cwt.,—the highest price I believe, ever paid in Ceylon for cocoa. I have sold several parcels since at R70, 71, and 73, and have not heard of any sales to come up to that.—Yours faithfully, R. EDLEY.

THE TAXATION ON TEA LAND IN CEYLON: TOLLS, &c.

Dear Sir,—A great deal has lately been written about the taxation of paddy; but no one seems to have examined the incidence of taxation on tea cultivation. From figures at my disposal I have endeavoured to ascertain as nearly as possible the amount per acre contributed by a tea estate, and the following is the result given approximately:—

	per acre. R	c
Rice Import duty	3	25
Tolls on tea, rice, lead etc., ...	3	00
Stamp duties on deeds, cart notes, insurances bonds, agreements etc.		50
Customs duty and tolls on consumption of salt, salt fish, cotton goods and other dutiable articles by coolies and superintendent.	2	75
Export duties		50
Total...	R10	00

The revenue of Ceylon is in round numbers R15,000,000, but the whole of this is not derived from taxation, land and timber sales, pearl fishery receipts, and the bulk of the railway receipts and harbour dues are not taxes but excluding these the balance derived from taxation is about R9,000,000. The cultivated area of Ceylon is (Ceylon Directory) about 3,000,000 acres, and of this tea occupies 200,000, therefore tea should pay for its fair share 1·15th of R9,000,000 or R600,000 and there is very little doubt that it really contributes at least three and perhaps four times that amount. It has been contended by some that the import duty does not fall upon the planter; but obviously that person pays the tax who would be benefited by its removal. At present I am making a profit of 12½ cents (last year it was a loss) per bushel of rice, this would be converted into a profit of 41½ cents by the removal of the tax, and even if rice was issued at cost price and rates of pay not lowered we should benefit by the increased number of coolies who would flock over when what would practically amount to a rise of pay was given; less coast advances would be needed and less flush lost through shortness of labour. It may also be contended that tolls are not a tax but payment for services rendered, viz., upkeep of roads. A moment's consideration will show that this is not the case, We are supposed to get services rendered for all taxation in the shape of such a Government, etc., and other blessings such as trial by jury etc., etc., and moreover if tolls are merely for the upkeep of the roads they are placed on they should be credited to the districts in which they are levied and any surplus over upkeep should be expended in either improving the roads of that district or in reducing toll there. Toll rents however seem to be paid into the general revenue, and the districts where they are collected get no benefit whatever from them. To make the thing still plainer, if the Government in lieu of tolls were to levy a land-tax from me of R3 per acre, I should be no loser nor would Government, the services would still be rendered, but it would then be seen that a tax was paid. Stamp duties will be generally admitted to be taxation and import duty on personal and coolies' consumption of dutiable articles and tolls thereon stand on the same footing as the import duty on rice.

It appears to be time for a revision of its taxation in the interest of the tea planter at any rate and direct taxation would be preferable to the present system as it would at all events open the eyes of all and sundry to the extortionate amount we have to pay at present. I do not see why we should dread a land tax. Government can hardly assess more for the hillsides and ridges than for the alluvial valleys where the paddy fields are or the chena on identical land just outside the boundary of many tea estates. A land tax would also be fairer in the case of opening new land. At present, tea begins to pay tax through import duty the instant jungle is felled, whereas paddy though an annual crop does not pay for four years. This exemption would no doubt be extended to tea and other products.

The planting representative need not look further than his constituents if he wishes to redress unequal taxation. He might ascertain from the Government for instance on what principle and at what distance are tolls placed on public roads. At present in this neighbourhood there are on a stretch of road 28 miles in length 4 tolls, 2 of them in a distance of 12 miles. The effect of these combined with cost of transport raises the cost of salt 100 per cent, and other provisions are sold at greatly enhanced rates. These tolls therefore operate as a food tax. The cost of tolls on 80 or 90 miles of road is ½ cent per lb. of tea and 12½ cents per bushel of rice, or 25 per cent of the cost of transport in the one case and 16 per cent in the other. In no country that I am aware of are such high rates levied or at such frequent intervals. It is a severe tax on such comparatively valuable commodities as tea and coffee, but it absolutely stifles all vehicular traffic in low-priced native products such as straw, by-products of various palms and jungle produce which it would pay to send to Colombo were transport cheaper. At present carters prefer to return with empty carts if they cannot get a full load, as the extra toll on loaded carts will take all the hire of a half or quarter load. More than half the total toll receipts were collected in the Western Province for the year 1888. This cannot be fair on that province, as it can hardly be that half the expenditure takes place there. I believe if you can lay your hands on the figures that the railway would not be in it as a paying concern with the road from Pelmadulla to Colombo; and surely roads at any rate were not intended as a means of revenue but to develop the country. We have to pay the ½ cent Mr. Skrine objects to and do without a railway as well. What the Badulla planters pay as tolls for the long mileage used by them must be enormous—at least ½ cent per lb. tea. It is a matter the Badulla Association should take up; districts without railways are sufficiently handicapped without being weighted with excessive tolls. If the Ceylon Government would follow the example of the English Government and do away with tolls it would be for the public advantage. The present system is wasteful, a large amount of the tolls going into the renter's pockets. If it is not possible to do away with tolls, they should be reduced to a reasonable amount. It becomes serious when they amount to 25 per cent of the total cost of transport. I see the pet province has no tolls and the Eastern practically none: why this favour? No toll receipts appear for 1888 for the N.-C. Province and only R900 for the Eastern; what can be done in these provinces can surely be extended to the other portions of the island.—Yours truly,

B. B. B.

INDIGENOUS WOODS FOR TEA BOXES A WARNING TO PLANTERS.

Dear Sir,—With the growing expansion of tea cultivation, comes the great demand for tea-box wood. I have lately observed in some of my travels that the village carpenter has taken to prepare any sort of timber, no matter how inferior. Many must damage and destroy the tea, when used as they now, are in a green and unseasoned state. The

supply of suitable wood has already become exhausted in the native gardens in the Central Province.

There is no need to import tea-box wood into this island while we have so many quick-growing trees, and none can equal that excellent tree the lunumidella, *Melia dubid.* It loves heat and moisture and grows luxuriantly from sea-level to 2,000 feet, and in ten years can be utilized for tea chests.

I consider wild mango, *Mangifera zeylanica*, and the red cotton tree (katu-imbul), *Bombax Malabaricum*, may be used, but the wood should be cut for some time, as the resinous juices they contain are of a corrodent nature and would very soon destroy the lead lining of a tea chest. The following woods should be avoided; nevertheless it is difficult to reject them, as the carpenters mix them up *with other* woods:—Kekuna, *Canarium zeylanicum*.—Wood contains a resinous balsam, is used by the natives for burning after being mixed with paddy chaff, and the smoke given off is reputed to drive away snakes. The wood is worthless and readily attacked by insects. This tree is one of the most characteristic features of a village garden, its silvery white foliage add a pleasing contrast to our sylvan hamlets. It belongs to that Nat. Order *Burseraceæ* producing balsamiferous trees and shrubs.

Rukattana, *Alstonia scholaris*.—Boards of this wood are used by children in the Indian schools to write their lessons on, hence its name. The wood is very light and does not stand exposure for any length of time, is as bitter as gentian; in common use in Ceylon for coffin making. The bark is *a powerful* tonic.

Riti, *Antiaris innoxia*.—A stately evergreen tree with light-coloured shiny bark, common in our village forests up to 1,500 feet above sea-level: wood light and very inferior, rapidly decays when cut up. In the Madras Presidency the natives make bags from the bark by a very simple process. A branch is cut, corresponding to the length and diameter of the sack wanted. It is soaked a little, and then beaten with clubs until the inner bark separates from the wood. This done, the sack, formed of the bark, is turned inside out and pulled down until the wood is sawn off, with the exception of a small piece left to form the bottom of the sack, and which is carefully left untouched. The Sinhalese also form bags from the bark, but in a rude and simple way. The tree produces a small fruit like a fig, purple or crimson, pyriform, velvety and intensely bitter. Known as the upas tree of Java. The upas antiaris poison is prepared from the juice, which flows from incisions in the bark. Belongs to the Nat. Order *Urticaceæ*, containing figs and nettles and many valuable fibre plants.

ARBORIST.

CACAO CULTIVATION.

March 27th.

Dear Sir,—After all that has been lately written in disparagement of cacao by disappointed planters, it is refreshing to see Mr. Holloway coming forward with advice and encouragement for all sceptics.

There can be no doubt that the variety of cacao which he so freely advertises is the very best for planters who know how to treat their soil and to grow shade properly, and who know the right time to prune their trees, but a large proportion of planters have still a good deal to learn; the majority, I believe, never prune at all.

In your issue of 21st instant (see page 739) you made mention of one fortunate proprietor whose crop last year "was not far off an average of 5 per cwt. per acre" a very fair yield.

Your recent correspondent "Eldorado" and other hostile critics, though correct in their arithmetic as to the *average* return (from 12,000 acres planted before 1885) being less than 1½ cwt. per acre, evidently wrote under the impression that an acre in cultivation is necessarily in full bearing when six years old. But the only way to arrive at good results is to calculate, as Mr. Holloway has done, the crop given by the very finest trees, then allow say 300 good trees to an acre and write down one's acreage according to the number of good trees scattered over the whole estate. In this way, most estates will show returns "not far off an average of 5 cwt. per acre," and some even more than this, which will satisfy even "Eldorado," and the figures in your Directory will be brought down from 12,050 to about 3,000 as being under cacao cultivation.—Yours faithfully,

VINCIT VERITAS.

Loss from Insects and Fungi in the United States.—Professor T. Maynard states on the authority of the Entomological Division of the Department of Agriculture, that the loss to the farming interests, including all its branches, for the past year from insects and fungi amounts to $400,000,000, say over £80,000,000.

Pepper Cultivation in Perak is thus noticed in a report on the district of Kuala Kangsa:—

The Secretary to Government arrived here on the morning of the 3rd, and was engaged all day in Court. On the night of the 3rd I accompanied him to Chigar Galah, where we arrived early the next morning, and inspected the pepper estate of Syed Musa. On the whole, the estate appears to be doing well; but as is usually the case with plantations superintended by Malays, there is not sufficient attention paid to the tying up of the vines, and some portions of the estate are not kept so clean as they might be. Mr. Treacher proposed that an experienced Chinaman should be employed to supervise the work of the contractors, who are mostly Achinese. Syed Musa was pleased with the suggestion, and Mr. Lee Kong Lin, who accompanied us, undertook to secure the services of a man for this purpose. There are a number of smaller plantations at Chigar Galah, the owners of which have been supplied with dedap and pepper cuttings by Seyd Musa. The Secretary to Government visited several of these, and also a clearing about 9 acres in extent on the opposite bank of the river, belonging to Syed Abdulrahman. This land has been most judiciously selected both as regards aspect and soil; the latter being even more suitable for the cultivation of pepper than that of Syed Musa's estate.

The Government plantation at Tempurong, which is about 8 acres in extent, includes a large nursery which contains about 30,000 plants, and these can be supplied to planters here at a far more reasonable price than that which they have hitherto been paying for cuttings purchased from Ara Kuda and elsewhere. The Government plantation at Pondok, which was also visited by Mr. Treacher, is a failure, as the Malays and others interested in the cultivation of pepper always predicted it would be. The soil there is composed principally of bat guano, and, although for the first two or three years the pepper vines appeared to be thriving, they are now all dying off.

Great damage is being done to the pepper plantations by the buffaloes that are allowed by their owners to stray at night. In a few instances the former have been captured and the owners identified, but as a rule this is not possible, as the buffaloes come in herds, and any attempt to catch them only leads to further damage being done to the trees and vines.

About twenty years ago complaints of damage done to coffee estates in Ceylon by buffaloes were incessant. Now we never hear of damage done by these animals to tea or other culture.

COCOA.—That veteran planter Mr. Alfred Payne, of the Kurunegale district, must be congratulated on the fine price he has recently obtained for his cocoa from Isabel estate. It has been sold locally at R65 per cwt., which I believe, is the highest price ever obtained in Colombo for this product.

COCOA CULTIVATION.—We learn from a planter whose crop last year was not far off an average of 5 cwt. per acre, that no product responds so well to bulky manure as cacao. Wherever cattle manure or town refuse and sewage can be readily obtained for a cacao field the return is sure to be satisfactory.

CINCHONA.—"Crab-Apple" writes:—A friend of mine who owns a large cinchona estate in Wynaad, last July and August shaved 100 acres of Ledger. Renewal at once set in, so fine and strong, that in the early part of February last he decided to coppice the same 100 acres. This work is now almost finished, and up to date most satisfactory results have been obtained. Over fifteen analyses have been taken off different portions of the estate, and in many cases the renewed has analysed more than the orignal bark, though in most cases about the same. As regards quantity of bark, the renewed is as thick, if not thicker than the original: The consignments of bark that have reached the London market have fetched good prices. As will be seen from the above, the experiment has proved satisfactory in every way. I believe this to be the first acreage of any scale that has been shaved, and I think clearly proves that shaving Ledger pays.—*Madras Times.*

INDIAN AGRICULTURE: EFFECTS OF HEMP AS GREEN MANURE.—Some very valuable experiments have been made at the Cawnpore Experimental Station, of which Dr. Voelcker has spoken with approval. From the latest report we quote as follows:—

		lb.	
Page 11, average for six years,		950	
,, 12,	ditto	... 1,133	
,, 13,	ditto	... 956	
,, 13,	ditto	... 940	
,, 14,	ditto	... 659	(average of 2 plots).
,, 14,	ditto	... 596	(ditto 6 do.)
,, 14,	ditto	... 614	
,, 15,	ditto	... 586	(ditto 4 do.)

The yield of unmanured land in a series of years is one of the most interesting points on which information is being collected. There are a good many such plots on the farm. I give in the margin the average outturn of wheat per acre of all plots which have been without manure and under wheat for the past six years. In some of these plots the yield is possibly still affected by manure applied before the land was placed under the present series of experiments, and may be expected to decrease in future years. Taking a bushel of wheat at 61 lb., the general yield of unmanured land of the kind found on the Cawnpore Farm—a loam of average fertility cropped year after year and carefully watered and tilled—may be put at 10 to 13 bushels an acre. The American average for all the States of the Union is about 12 bushels. The English average is 30 bushels. The Cawnpore experiments conclusively show that 5 to 10 bushels can be easily added to the average yield by the application of R5 worth of farmyard manure or even by green-soiling with hemp at the cost of R3-8-0 per acre. This is putting the increase at a minimum. The six years' average yield of the plot manured with farmyard manure only in the "Rabi duplicate series" is 27 bushels, and of the plot manured with *poudrette* 28 bushels. Thus we get the American average on our unmanured land and approximate to the English average on our manured. I am afraid that the American average is not unfrequent in many districts of these Provinces, especially in those where canals enable the cultivator to subject the soil to a systematic process of exhaustion. As regards the comparative value of manures, the experience of the Cawnpore Farm is not favourable to artificial or extraordinary fertilizers. Bones, bone-superphosphate, gypsum, kainit, &c., are considerably more costly in this country than the common kinds of manure and so far as they have been tried they have not given commensurate results Green-soiling with indigo or hemp might, however, be more commonly adopted by the Indian agriculturist than at present. The cost of sowing hemp and ploughing it in when green is put at R3-8-0 an acre. But this is chiefly made up of hire of labour and bullocks, and the cultivator can find both without actual expenditure of money. In districts where indigo is not a staple crop, the fields destined for wheat (unmixed) are almost invariably left fallow in the preceding kharif. To sow these with hemp instead of fallowing them would, according to the Cawnpore Farm Experiments, make the wheat crop heavier. Most of the produce of the farm is sold to the public for seed, the seed-grain being carefully cleaned and selected. Dr. Voelcker was of opinion that this branch should be developed, and some of the minor experiments abandoned. I am considering how effect can best be given to this suggestion. The demand for good wheat, cotton, barley, and maize seed is increasing, and in endeavouring to meet it the farm can be of practical utility.

CEYLON EXPORTS AND DISTRIBUTION, 1891.

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1891 B'nch & Trunk lb.	Tea. 1891 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1891 cwt.	Coconut Oil. 1890 cwt.	Pl'bago 1891 cwt.
To United Kingdom ...	16540	...	16540	1135321	11922084	7490	30890	188901	5421	14464	...	31142
,, Marseilles ...	...	33	33	...	8991	39	...	35100	...	...	...	...
,, Barcelona ...	...	...	...	...	3300	...	...	36000	...	...	...	...
,, Genoa ...	...	...	...	...	100	...	...	33700	8400	203	394	...
,, Venice ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Trieste ...	1402	...	1402	...	210	...	...	...	2250	951	600	...
,, Odessa ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Hamburg ...	...	...	...	...	...	77	...	72975	25200	3812	...	8248
,, Antwerp ...	18	...	18	26662	...	...	...	5000	...	602	...	1009
,, Bremen ...	1	...	1	...	1789	...	...	...	...	...	...	...
,, Havre ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	10	...
,, Africa ...	20	...	20	...	5193	...	...	...	...	...	...	...
,, Mauritius and Eastward	11	...	11	...	15570	...	...	...	...	1025	3637	...
,, India ...	661	1151	1812	...	20891	...	41057	14528	...	22498	11044	10
,, Australia & New Zealand	1392	327	1719	...	518393	...	40	1000	2240	603	6	...
,, America ...	...	...	...	141545	30923	991	...	12000	...	20575	4001	47146
,, Stockholm ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Constantinople ...	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 23rd March 1891	20045	1511	21556	1324966	12527444	8597	71987	399204	43511	64733		87555
Do 1890	40819	976	41795	1674324	8002432	6113	106676	325714	61105	19722		79126
Do 1889	24189	2003	26192	2198716	6161935	6680	91280	353067	114493	68245		95635
Do 1888	51544	1295	55839	2223362	3642952	6272	94121	239349	230204	73732		44213

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, February 26th, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
ALOES, Socotrine	Good and fine dry	£4 a £7
Zanzibar & Hepatic	Common and good	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red	Renewed	2d a 1s
	Medium to good Quill	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a 1½d
BEES' WAX, E.I., White	Good to fine	£6 a £7
Yellow	,, ,,	95s a 115s
Mauritius & Madagascar	Fair to good	110s a 125s
CARDAMOMS—		
Allepee	Fair to fine clipped	1s a 2s 2d
Mangalore	Bold, bright, fair to fine	1s 6d a 3s
Malabar	Good to fine plump, cliped	2s a 2s 6d
Ceylon. Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s a 1s 6d
Alleppee and Mysore sort	Small to bold brown	1s a 1s 6d
	Fair to good bold	2s 6d a 3s 9d
	,, ,, medium	1s 6d a 1s 10d
Long wild Ceylon	,, ,, small	1s a 1s 4d
CASTOR OIL, 1sts	Middling to good	6d a 2s 2d
2nds	White	4½d a 4¾d
3rds	Fair and good pale	3¾d a 3⅞d
CHILLIES, Zanzibar	Brown and brownish	3¼d a 3½d
	Fair to fine bright	75s a 85s
CINNAMON, 1sts	Ord'y. and middling	60s a 70s
2nds	Ord'y. to fine pale quill	7½d a 1s 2d
3rds	,, ,, ,, ,,	7d a 1s
4ths	,, ,, ,, ,,	6½d a 10d
Chips	Woody and hard	5¾d a 7d
CLOVES, Zanzibar	Fair to fine plant	2d a 6½d
and Pemba.	Fair to fine bright	3¾d a 4d
,, STEMS	Common dull and mixed	3½d a 3⅝d
COCCULUS INDICUS	Common to good	⅞d a 1d
COLOMBO ROOT	Fair sifted	12s a 13s
	Good to fine bright sound	20s a 27s 6d
CROTON SEEDS, sifted	Ordinary & midling	16s a 20s
CUTCH	Fair to fine fresh	10s a 15s
DRAGONS BLOOD, Zanzibar	Fair to fine dry	24s a 32s 6d
GALLS, Bussorah & Turkey	Ordinary to good drop	50s a 90s
	Fair to find dark blue	52s 6d a 57s 6d
GINGER, Cochin, Cut	Good white and green	40s a 50s
,,	Good to fine bold	75s a 80s
Rough	Small and medium	40s a 52s 6d
,,	Fair to fine bold	32s 6d a 42s 6d
Bengal, Rough	Small and medium	26s a 30s
GUM AMMONIACUM	Fair to good	18s
ANIMI, washed	Blocky to fine clean	20s a 50s
	Picked fine pale in sorts	£12 a £14
	Part yellow & mixed do.	£10 a £12
	Bean & Pea size ditto	£5 a £7 10s
	Amber and red bold	£10 a £12
scraped	Medium & bold sorts	£6 10s a £11
ARABIC E.I. & Aden	Good to fine pale frosted sifted	60s a 80s
	Sorts, dull red to fair	35s a 55s
Ghatti	Good to fine pale selected	45s a 55s
	Sorts middling to good	23s a 33s
Amrad cha.	Good and fine pale	60s a 100s
	Reddish to pale brown	25s a 50s
Madras	Dark to fine pale	15s a 55s
ASSAFŒTIDA	Fair to fine pinky block and drop	30s a 50s
	Ordinary stony to midling	16s a 25s
KINO	Fair to fine bright	35s a 37s 6d
MYRRH, picked	Fair to fine pale	£6 a £8
Aden sorts	Middling to good	70s a 85s
OLIBANUM, drop	Fair to fine white	30s a 45s
,,	Reddish to middling	22s 6d a 30s
pickings	Middling to good pale	12s a 20s
siftings	Slightly foul to fine	10s a 15s
INDIARUBBER	Red hard clean ball	2s 2d a 2s 5d
East African Ports, Zanzibar and Mozambique Coast	White softish ditto	1s 8d a 2s 3d
	Unripe root	1s 3d a 1s 10d
	Liver	1s 6d a 2s 1d
	Sausage, fair to fine	2s a 2s 1d
Assam,	Good to fine	1s 8d a 2s 3d
	Common foul & middling	9d a 1s 6d
Rangoon	Fair to good clean	1s 11½d a 2s 2d
Madagascar, Tamatave, Majunga and Nossibe	Good to fine pinky & white	2s 2d a 2s 101
	Fair to good black	1s 10d a 2s 2d
ISINGLASS or FISH MAWS, Tongue	good to fine pale	2s 9d a 3s 8d
	dark to fair	1s a 2s 6d
Bladder Pipe	Clean thin to fino bold	1s 6d a 3s 7d
Purse	Dark mixed to fine pale	6½d a 1s 8d
Kurrachee Leaf	Common to good pale	1s 9d a 3s 10d

EAST INDIA *Continued* East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS.
INDIGO, Bengal	Middling to fine violet	4s 6d a 6s
	Ordinary to middling	3s 6d a 4s 3d
Kurpah	Fair to good reddish violt	3s a 3s 7d
	Ordinary and middling	2s 3d a 2s 10d
Madras (Dry Leaf)	Middling to good	2s 8d a 3s 2d
	Low to ordinary	1s 8d a 2s 6d
IVORY—Elephants' Teeth— 60 lb & upwards	Soft slightly def. to sound	£69 a £76 10
over 30 & under 60 lb.	,, ,,	£64 a £72
40 a 100 lb.	Hard ,, ,,	£49 10s a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,,	Hard ,, ,,	£25 a £33 10s
Billiard Ball Pieces 2½ a 3½ in	Sound	£78 10s a £83 10s
Bagatelle Points	Sli. def. to fine sound	£66 a £75
Cut Points for Balls	Shaky to fine solid sd.	£55 a £73
Mixed Points & Tips	Defective, part hard	£31 a £53 10s
Cut Hollows	Thin to thick sli. def to sound	£30 10s a £57
Sea Horse Teeth— ¾ a 4½ lb.	Crvd. crkd & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Shimlies I, good & fine pale	12s a 13s
	,, II, fair pickings	8s a 9s
	Jubblepore I, good & fine	11s 6d a 12s 6d
	,, II, fair rejections	8s 6d a 9s 3d
	Vingorlas, good and fine	9s 6d a 11s
Madras, Upper Godavery	Good to fine picked	11s a 11s 6d
,, ,,	Common to middling	8s 6d a 9s 9d
Coast	Fair	10s a 10s 6d
Pickings	Burnt and defective	7s a 8s 9d
MACE, Bombay	Dark to good bold pale	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,,	64's a 80's	2s 10d a 3s 3d
	83's a 180's	1s 6d a 2s 9d
NUX VOMICA, Cochin, Madras and Bombay	Fair to fine bold fresh	10s a 12s 6d
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON	Fair to fine heavy	1s a 2s 6d
CITRONELLE	Bright & good flavour	⅝d a ¾d
LEMONGRASS	,, ,, ,,	1½d a 1¾d
ORCHELLA WEED, Ceylon	Mid. to fine, not woody	20s a 25s
Zanzibar	Picked clean flat leaf	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER— Malabar, Black sifted	Fair to bold heavy	4 3-16d a 4¾d
Alleppee & Tellicherry	,, good ,,	
Tellicherry, White	,, ,, ,,	1s a 1s 1d
PLUMBAGO, Lump	Fair to fine bright bold	15s a 21s
	Middling to good small	11s a 14s
Chips	Sli'tly foul to fine bright	9s a 12s
Dust	Ordinary to fine bright	4s 6d a 7s 6d
RED WOOD	Fair and fine bold	£3 a £3 10s
SAFFLOWER, Bengal	Good to fine pinky	55s a 70s
	Ordinary to fair	28s a 50s
	Inferior and pickings	15s a 25s
SALTPETRE, Bengal	Ordinary to good	16s 6d a 17s
SANDAL WOOD, Logs	Fair to fine flavour	£35 a £60
,, ,, Chips	Inferior to fine	£9 a £30
SAPAN WOOD	Lean to good bold	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 70s
SENNA, Tinnevelly	Good to fine bold green	6d a 8d
	Medium to bold green	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a 1½d
Bombay	Ordinary to good	1d a 2½d
SHELLS, M.-o'-P.	EGYPTIAN—med. to large	88s a 100s
	small and medium	90s a 100s
	oyster and chicken	85s a 100s
large	BOMBAY—fine thick	92s 6d a 102s 6d
medium and large	bright fairly clean	90s a 102s 6d
small and medium	,, ,, ,,	90s a 102s 6d
chicken	,, ,, ,,	85s a 97s 6d
oyster and thin	,, ,, ,,	80s a 92s 6d
Mussel	Ordinary to fine bold	24s a 55s
Lingah	Sorts	3s a 10s
TAMARINDS	Mid. to fine blk not stony	10s a 12s 6d
	Stony and inferior	4s a 6s
TORTOISESHELL	Fair & fine clean heavy	17s a 30s
Zanzibar and Bombay	Low thin to mid. clean	7s a 16s 6d
TURMERIC, Bengal	Leanish to fine plump finger	14s a 15s
Madras	Fin. fair to fine bold brgt	16s a 18s
,,	Mixed middling	15s a 16s
,,	Bulbs	10s a 12s
Cochin	Finger	11s a 12s
VANILLOES, Bourbon, 1sts	Fine, cryst'ed 5 to 9 in.	14s a 20s
Mauritius, 2nds	Foxy & reddish 5 to 8 in.	10s a 15s
Seychelles, 3rds	Lean & dry to mid. under 6 in.	7s a 10s
Madagascar, 4ths	Low, foxy, inferior and pickings	3s 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for April :—

ARTESIAN WELLS.

THE most favourable condition which renders artesian wells possible is a basin-shaped arrangement of porous and impermeable strata. The surface water flows along the line of dip down the porous strata till the latter become as it were surcharged like a sponge ; so that if a boring were made down to a water-bearing stratum of this character, the water which had no means of rising through to the impermeable stratum above it, will owing to the hydraulic pressure gush out at the surface. The following examples are given by Prof. Geikie to show the great depth to which artesian wells may be sunk: at Grenelle (Paris) the water rises from a depth of 1,771 feet ; at Neusalzwerk, near Minden, the depth is 2,394 feet; at Louisville in Kentucky, 2,086 feet; at St. Louis on the Missouri, 2,624 feet. The hydraulic pressure under which the water is forced to the surface is often very great. At Grenelle the fountain ascended at first 112 feet, at Louisville 170 feet. The continuity of the typical underground basin may be interrupted, and in many cases artesian wells merely tap underground waters which would otherwise find an outlet to the surface as junction springs.

The advantages of artesian wells are thus set forth by Mr. Tousher of Malmesbury, who undertakes to bore and drill artesian wells :—

1. Because they are bored to such a great depth, the depths of the deepest wells being insignificant. 2. Because they can be bored and drilled through strata where it would be impossible to dig, for instance quicksand. 3. Because there is no necessity to stop at the first water obtained, as is the case in dug wells, but that if the first water should be brackish or impure, it can be completely shut off, and the boring proceeded with until the next water-bearing stratum is reached, and so on. 4. Because the water obtained is always pure, as the artesian well does not allow any contaminated water to come in, while the water in a dug well is always more or less impure, as, being drainage water, it will always permit decomposed matter to percolate into the well. 5. Because the water is always copious and unfailing, being drawn from the underground strata, while the water in a dug well is always directly dependent on the rainfall. 6. Because they are almost everlasting, not being liable to tumble in like a dug well. 7. Because there is no danger attached to them. 8. Because they are cheaper. 9. Because they can be bored from the bottom of any dug well, no matter how deep, and whether it contains water or not, and without in the least interfering with present arrangements; thus saving the expense of boring to the depth of any existing well at any place. Mr. Tousher as an interested witness to the advantages of artesian wells, it may be thought speaks too disparagingly of dug wells, but it must be admitted that his remarks are in the main well founded.

Mr. Henry Penning of the Geological Survey of England and Wales, writing on this subject, says that the water supply of a district is not by any means proportionate to its rainfall—the water-bearing beds being great distributors that equalise the supply. The supply to be obtained by boring down to a deep-seated spring, is, he says, practically inexhaustible, being rarely, if at all, affected by drought, and these springs form the only source on which can be placed a full reliance. Referring to the light which geology throws on the question of water-supply, Mr. Penning says "An improvement in the water-supply of a district is one of the practical results that may be expected to arise

from the working out of its geological structure—that is, from the knowledge obtained of its rocks and of their relation to each other. The phenomena of springs and the sources of supply to artesian wells are so entirely dependent on stratigraphical and physical features, that an acquaintance with their principals cannot fail to be of use to the student of field geology. . . . .

It follows that when all the condition of dip, permeability and continuity are known, it becomes a matter not of speculation but of certainty to estimate the depth at which water will be found, and the height to which it will rise in a well."

With rumours of a geological survey and of artesian wells, the despondent agriculturists of our drought-stricken districts may well gain a little courage!

OCCASIONAL NOTES.

A correspondent writes with reference to the yield of Arekanuts:—Now that attention has been called by you to the cultivation of arekanuts, and a question raised as to the income derivable from this product, it may be interesting to you and your readers to know that 50 cents per tree is by no means a high average—that is to say where it is cultivated as it should be. The safer valuation of 25 cents per tree, to which some well-informed people would incline, may be based on the experience gained by natives from the produce of their *arambas* or groves. But then these arambus are invariably planted so closely, that the plants do not get sufficient feeding ground and sunlight. The consequence is that they get attenuated, reaching a great height and yielding individually but a small crop. Let the plant stand 12 feet apart between the rows and far enough in the lines to enable the pluckers to go from one tree to another without descending and thus making the harvesting of the crop an expensive work, and it will be found that the plants in ordinarily favourable situations, will come into bearing so early as at 5 years, and that they will yield more than twice the crop obtained by the natives, who plant them among *jak, kitul* and other such garden products, along with which the areka has to share the enjoyment of sunlight and soil. I have counted up to 300 nuts in a bunch, though, I am told, a maximum of 500 may be reached. The price of arekanuts is about from 75 cents to a rupee per 1000, and you should not think it too much to expect from 500 to 1000 nuts to a whole year's crop. However, if you obtained only 25 cents per tree, still, with 600 or 700 trees to the acre, it will be no mean product.

The Kew Bulletin for February contains a note on Kath or Pale Cutch. This substance also known as Pale Catechu is prepared from *acacia catechu*, and is to be distinguished from cutch or catechu, and from gambier which is sometimes called Pale Cutechu. Pale cutch is the substance used all over India and in Ceylon for mixing with betel leaves &c. for chewing purposes, and is known in Sinhalese as *Caypoo*. Catechu is used in medicine, especially Veterinary medicine, as an astringent, and the catechu of Burmah (poor in catechin) is exported to Europe as a dye stuff. Pale catechu or Kath when pure consists chiefly of catechin, a chrystallising substance nearly insoluble in cold water, and which must not be brought in contact with iron. Its preparation is a long and tedious process, as the extract got from boiling the wood-shavings of *acacia catechu* has to be brought to a high degree of concentration and left to stand for a long time, till the catechu is got to chrystallise out of the catechu tannin, with which it is found mixed. The preparation of the dark catechu which consists chiefly of catechu tannin, is a much simpler process, and is merely a boiling down of a watery extract of the wood of *A. Catechu* and *A. Suma.* Pale catechu or Kath and Gambier have been pointed out by Flückiger and Hanbury to agree in composition, both consisting mainly of catechin (*Catechucic acid).* As Pale catechu so closely agrees with gambier, which is now in great demand, it is surprising, thinks the Kew Bulletin, that it is not exported to Europe, where it would be readily accepted by the dyers as a substitute.

The word *Catechu* is considered by some writers to be a modern Latin derivative from the South Indian name *Kachu,* and that from South India the product was first exported; while others derive it from the Cochin Chinese word *Caycan,* which is no doubt connected with the Sinhalese *Caypoo.* The Sanscrit authors mention the drug, and Barbosa in 1514 notices what is in all probability is this drug under the name of *Cacho.*

It is interesting and sometimes amusing to read the opinions of old writers on Ceylon regarding the agricultural capabilities of the Island. Sir Samuel Baker, like the promoters of the late Model Farm at Colombo, committed a huge mistake when he attempted to start farming in Ceylon upon the lines he choose to work on, and in both cases the projects resulted in signal failures. No doubt Sir Samuel wrote with a prejudiced mind when he condemned in such general and emphatic terms the soils of Ceylon, for their extreme poverty. In his book entitled "Wanderings in Ceylon" there are, however, observations and suggestions which prove that the author had evidently carefully examined into the needs, and considered the means of improvement of the natives of the Island. He refers to Mr. Thurston's Industrial School in the Cinnamon Gardens of Colombo, on the site now occupied by the School of Agricultnre, and suggests that the Government should develop the plan upon which that establishment was worked, so as to bring an agricultural and technical education within the reach of the masses, and specially advices that an improved system of cultivation should be introduced to the natives, and that new products should be brought to their notice. So far as the suggestions referring to agricultural education are concerned, Sir Samuel Baker's advice has been acted upon, while there is also a move to give effect to his suggestions regarding technical education. It is not of course to be considered that these results have been brought about by Sir Samuel Baker's work, but it must be admitted that the author had studied the condition and requirements of the people of Ceylon, at a time when few—the Government excluded—were sensible to the fact that there was a reform to be worked, which remained for Mr. H. W. Green to initiate.

The idea of having small tracts of land attached to schools about the country, so that each school may have its own experiments in agriculture, has been carried out to a considerable extent. The "narrow policy of Government" with regard to salt, which of late has been much discussed, is condemned by Sir Samuel Baker in strong terms, among other reasons for impeding the preparation of hides. The chief obstacle in the tanning industry in Ceylon is now however not so much the high rate of salt as the difficulty in procuring hides. Of the natives we are told that they never stint time and trouble where the prospect of money is safe; and with this remark we quite agree, though we were understood (wrongly) to think otherwise, from our remarks on native enterprise in a previous issue of this Magazine.

Dr. Trimen's Administration Report for 1890 is out early as usual, and is as full and interesting as previous reports. Under the heading of "Economic Plants" we find that the acquisition of the true gambier *(Uncaria Gambier)* has, after many failures, been at last accomplished. "It is clearly," says Dr. Trimen, "very fastidious and difficult to propagate, but it ought to succeed in our hottest and wettest districts. Naturally an extensive climber, it is in cultivation kept down by cutting so as to form a low bush of 5 or 6 feet. With Cubebs (*Piper Cubeba*), however, Dr. Trimen is unable to report any progress, and the plant "still remains a desideratum." There is also a note on Chinese ginger, which in our last issue, we reported as having been identified with *alpinia galanga*, the well-known "Kaluwala" of the Sinhalese. "It is a little difficult to believe," says Dr. Trimen, "that the 'preserved ginger' of commerce is the produce of the same plant, especially as the rhizome has not the appearance of the commercial article: and I cannot help suspecting the possibility of a mistake having been made when originally sending the plant to Kew." Since, however, the identification of the plant has been accepted as correct by the authorities at Kew, it is only to be supposed that by careful selection and cultivation the original *alpinia galanga* has to some degree been metamorphosed into the "preserved ginger" plant of China.

In the report of the Saidipet Experimental Farm for the year 1879, is a note on the poisonous qualities of the grain known as *Amu* in Sinhalese, and *Varagu* in Tamil. This is one of the fine grains cultivated in the chenas of Ceylon, the seeds of which are small, black and shiny. Sometimes the effect of eating this grain is followed by a feeling of giddiness and prostration—in fact all the symptoms of poisoning evince themselves. In the absence of proper treatment, in some instances, the result has been the death of the consumers. In the villages of Ceylon, however, the people have a very simple remedy derived from common herbs, which counteracts any evil results from eating *amu*. Mr Wilkins, the Botanical lecturer at the Madras School of Agriculture, says that the poisonous grain is not the product of any particular variety, but of plants that yield the healthy grain; and bad seeds may produce wholesome grain. He has not been able to discover anything in bad grain that can account for its poisonous principlos. A number of instances have been recorded in India of the bad effects of this grain on man and cattle. It is generally held that grain raised at the proper reason is wholesome, but that raised on the samo ground as a second crop, and that raised on wet marshy ground, are both unwholesome. Dr. Bonavia's opinion is that after rain, when the ear is ripening, a fungus attacks it, and it is the fungus which does the mischief. This reminds one of the case of rye and other cereals and grasses, which are rendered unwholesome by reason of the attack of the fungus known as ergot (*Claviceps purpurea*) which has caused the death of many hundreds of people on the Continent, and innumerable cattle in England. Dr. Bonavia states that washing the grain well before cooking renders it harmless. Dr. Macrœ, late Chemical Examiner at Madras, did not think that the wholesome could be distinguished from the poisonous grain: but he observes that when a sample of bad grain was "placed in an air-tight chamber and exposed to the influence of air and water, some of the seeds germinated in three days, while a plentiful crop of what (MICROSCOPICALLY) appeared to be ordinary mould was developed." It will thus be seen that nothing certain appears to be known regarding the poisonous principle in *amu*, and that it is very desirable that further observation and experiment should be made so as to throw further light on the subject.

FURTHER NOTES ON GINGER.

By W. A. De Silva.

In my last contribution on ginger, I mentioned the method of cultivation of the true ginger, and its preparation for market for use in medicine and as a condiment. Ginger also finds its way to the market in the form of "*essence of ginger*," which is used largely in medicine. We also come across ginger in a preserved state. Preserved ginger is largely exported from the Chinese ports, and especially from Canton. In the January number of the Kew Bulletin, an account of the Chinese ginger plant is given, and it has been ascertained that the preserves are not manufactured from the true ginger, but from a rhizome obtained from another species of plant allied to the ginger. This has been accepted to be *Alphinia Galanga*, the *Kaluwala* of the Sinhalese. It has also been found out that Siam exports a species of ginger obtained from the rhizomes of a variety of *alpinia* known as *A. Zingiberina*, which is, however, not essentially distinct from *A. Galanga*. The rhizomes of the alpinias possess in addition to the characters of the true ginger an aromatic smell, and they are not so pungent as ginger. In Ceylon we find in addition to the *A. galanga* the supposed Chinese ginger, some other varieties of alpinia very similar to *A. galanga*: these are the *A. allughas*, Sin. *alugas*. *A. nutans*, S. *Rankiria*, and *A. Calcarata*, S. *Ketakiriya*. The rhizomes of all these possess the characters of the Chinese ginger, *A. galanga*.

Chinese ginger in a preserved state does not possess the characteristic [aromatic taste or smell present in any of the alpinias. This may

evidently be owing to its being lost or modified when prepared into a preserve.

Anyhow it is certain that the Chinese preserved ginger is quite different from *Zingiber officinale*. When ordinary ginger is preserved it can never be made to possess the characters of the imported preserves. The taste, size, and texture of the rhizome always differ much, and the true ginger, when preserved, is found to be of a very pungent taste and of a harder texture than the Chinese preserve. If then the Chinese preserves are made from the *A. galanga*, the Sinhalese *kaluwala*, there is a fair prospect of opening a new industry in Ceylon, as the plant seems to thrive well in the southern parts of the island, as well as in Kalutara, so far as I have seen. The only use which Kaluwala is put to by the Sinhalese is that of chewing the pungent and aromatic flowers of the plant along with betel, these flowers resembling cardamoms in taste. The rhizome is only occasionally employed as a medicine. The following is said to be the method adopted in China in making preserves of ginger:—Soon after the rhizomes are dug out they are washed clean, and after the outer covering or the epidermis is scraped off, rewashed, and kept in water for twenty-four hours. They are then taken out and are spread on a board, the portions which are in any way discoloured or spoilt being removed. Then the whole is pricked with forks which are made specially for this purpose. After having undergone this operation, the ginger is washed again and exposed to the sun till the water is evaporated. Next the rhizomes thus prepared are mixed with sugar and boiled for fully two hours. They are then placed in earthenware pots for a few days, after which they are subjected to the same process of boiling with sugar for a second time. This being the final operation, they are packed in small vessels and sent to the market.

LAWS OF CEYLON RELATING TO AGRICULTURE.

Ordinance No. 23 of 1889.

II. An Ordinance relating to the Irrigation and Cultivation of Paddy Lands.

[This is a consolidation of all the previous Ordinances on the subject, together with some amendments.]

CHAPTER I.

"*Proprietor*" means owner of paddy lands, and includes the cultivator or person in actual possession of any such land.

"*Occupant*" includes a person having the charge, management or control of any land or premises.

"*District*" means any korale, pattu or village, or any other subdivision of a province, which may from time to time be defined by the Governor by Proclamation in the Government *Gazette*.

"*Grain tax*" includes the tax, duty or share due to Government in respect of grain grown in this Island under any of the following Ordinances:—No. 14 of 1840, No. 29 of 1865, and No. 11 of 1878.

For the purposes of Chapters VII. and VIII. "majority of proprietors" means a majority consisting of two-thirds at least of the proprietors present. Provided that such majority shall represent at least one-third of the acreage benefited by such irrigation works, and if they do not represent one-third, then the votes of the proprietors representing two-thirds of the acreage to be benefited shall constitute the majority.

CHAPTER II.

1. There shall be a Board, consisting of the Governor, the Surveyor-General, the Director of Public Works, and such other persons as the Governor shall from time to time appoint, of whom one at least shall be an unofficial member of the Legislative Council, to be styled the Central Irrigation Board of Ceylon. In the absence of the Governor, the senior official member present at any meeting of such Board shall preside thereat.

2. In each province there shall be a Board to be styled the Provincial Irrigation Board, consisting of the Government Agent as President, the Provincial Engineer of the province, and such other persons as the Governor may appoint.

3. The Colonial Treasurer shall pay annually as soon as may be after the first day of January, into the irrigation fund, a sum equivalent to one-fourth of the grain tax collected in the several provinces during the preceding year; such irrigation fund shall be vested in the Central Irrigation Board.

4. Moneys voted by the Legislative Council for irrigation works shall be paid into the Irrigation fund.

5. The Central Irrigation Board shall prepare an estimate of sums to be apportioned from the irrigation fund to the provinces. Estimated apportionment to be laid before the Legislative Council.

(*a*) Provided that a sum so apportioned to any province may, if necessary, be re-apportioned; sums so re-apportioned shall be included in the annual report of the Board.

(*b*.) Provided also that sums not voted by the Legislative Council for specific purposes shall be apportioned or re-apportioned to each province.

6. Reports of Irrigation Boards shall be annually submitted to the Legislative Council.

7. All acts required to be done by the Irrigation Boards shall be done by a majority of the members of such Boards. The President shall have a casting vote.

CHAPTER III.

1. (*a*.) The Governor in Executive Council may proclaim irrigation districts.

(*b*.) The Government Agent shall call a public meeting or meetings (where more than one are required) for the purpose of determining whether this Ordinance shall be carried into operation with the aid of headmen or of Village Councils or of both.

2. Public notice of such meeting shall be given at least one month before the day fixed for the meeting, calling upon all proprietors within any district or division to attend in person or by proxy.

3. (*a*.) Every meeting so convened shall be held at the time and place appointed, in the

presence of the Government Agent; every proprietor within such district or division for which the meeting has been called shall be entitled to vote.

(*b.*) The Government Agent shall explain to them the provisions of the Ordinance.

(*c.*) The proprietors at such meeting shall appoint a Committee of not more than twelve, nor less than three persons, to be associated with the Government Agent for the purpose of carrying out the provisions of this Ordinance, and for advising him in matters connected with the irrigation of the district.

(*d.*) Where more meetings than one are held, each division shall be allowed to appoint its proportion of the Committee to make up the number for the entire district. When any members of the Committee die, or leave the district, or refuse to act, the Government Agent may appoint others in their stead.

(*e.*) The questions and resolutions proposed at any meeting, and the number of votes given for and against the same, shall be recorded in the Minutes of such meeting, and shall be signed by the Government Agent. The said Minutes shall be deposited in the provincial or district Kacheheri, and copies thereof, certified by the Government Agent, shall be transmitted to the Colonial Secretary.

4. All questions as to the right of any person to vote shall be decided by the Government Agent. Such question and the decision thereon shall be entered in the Minutes.

5. A majority consisting of two-thirds at least shall decide all questions or resolutions passed at any meeting.

6. The Government Agent may make rules in districts where proprietors cannot publicly meet.

7. All acts committed contrary to the customs and rules, and all complaints relating to matters provided for by this Ordinance shall be investigated and dealt with in manner provided in Chapter IV. or Chapter VI. according to the nature of each case.

H. A. J.

(*To be continued.*)

THE GRAPE VINE.

(*Vitis Vinifera.*)

4. *Soil and Climate.*—The Vine will thrive best on light soils that have a dry bottom. In such as are rich and deep, it will grow luxuriantly and produce abundance of large fruit. In shallow dry gravelly soils, it will produce less fruit but of better flavour. It grows well in the north of the Island where the soil is generally shallow and dry and lies on calcareous rock. The red sandy soils of Jaffna called *Chempadu* would grow good grapes for wine-making. Retentive clays are the worst soils for the vine. As it wants a very dry soil, it will be advisable to drain the land well where it is not sufficiently dry by nature. The bramble has been found to correspond to a great extent to the vine; and therefore any soil where the former grows freely would be good for the latter. We are growing some vines on such a soil here at Happy Valley, by way of experiment; but as yet I cannot write with much confidence about them, as the plants are still young.

A warm dry climate is best suited to the vine; and if we want to lay out a vineyard we ought to select a site freely exposed to the sun, especially to the morning sun. The dry hot districts of Jaffna in the north and Hambantota in the south will grow good grapes. As to the fitness of the former place there can be no doubt, as it has been practically proved by our Jaffna gardeners from the late Government Agent Mr. Dyke downwards. Grapes might also be grown with advantage in or near Chilaw, Puttalam, Mannar, Trincomalee, Batticaloa, and parts of Uva. There are indeed several other places in Ceylon where fairly good grapes can be grown for the table, by expert gardeners; Wahakotte, which I mentioned in the last instalment, being one of them. But of course where the requirements of climate and soil do not come up to the proper standard, no grapes suitable for making wine can be produced, as those grown in such places would be too deficient in saccharine matter.

5. *Propagation.*—There are at least four ways by which the Grape Vine is propagated, viz., by seed, layers, cuttings and grafting.

(1.) *By Seed.*—The vine may be propagated by seed produced by cross-fertilization for the sake of obtaining new varieties superior in the size of the bunch and berry, in flavour and delicacy, or in point of hardiness and productiveness. But as yet grape-culture in Ceylon has not advanced to such a degree of developement as to call for propagation in this way.

(2.) *By Layers.*—By this method large showy plants can be procured that will soon come into bearing. Loudon recommends the following plan for propagation by layers:—"At the pruning season leave a shoot of strong wood, over and above what may be wanted for training, of a sufficient length to bend down to any convenient place where a pot can be placed to receive it as a layer; and also for training it during its growth. When the vine begins to push, displace all the buds from the shoot intended for laying, except the leading one. When this is grown to about 8 inches or one foot in length, bend it down to the pot and lay it so that the top joint whence the wood has sprung, may be fixed with a strong crook at about one inch under the surface of the mould. As soon as it begins to take root, which may be known by removing a little of the earth, begin to weaken its resources from the mother plant, by making an incision in the wood behind the pot. Deepen this incision by degrees, as fast as the young plant will bear it, until it be quite separated from the old one."

(3.) *By Cuttings.*—This is the most convenient method for us in Ceylon where, generally speaking, Viticulture is yet in its infancy. The advantages of propagating by cuttings are simplicity of operation, economy in labour, and economy in the wood or shoots to be propagated from. The cuttings should be one foot to 18 inches long, and should be planted sloping-wise so as to leave only two eyes above ground. They may be first set in a nursery or in baskets and shaded till they strike, and then planted out after they have grown sufficiently.

(4.) *By Grafting.*—Delicate vines of superior variety can be grafted on stocks of hardy kinds,

and thus the desirable qualities of both can be preserved. This is about the best use of this mode of propagation. 'Grafting by approach,' in which the complete separation of the scion from the parent is effected after the former has begun to draw sap from the stock, recommends itself as the surest method. The best time for grafting is when the vine breaks into leaf after pruning and the shoots have grown about two feet.

E. T. HOOLE.

Haputale, 18th March 1891.

(To be continued.)

AGRICULTURAL LITERATURE AMONG THE ANCIENT INDIANS.

By W. A. DE SILVA.

The Rishis and Pandits of India who flourished during the earlier ages cultivated many a branch of science met with in the present day. Astronomy, chemistry, planetology, medicine, &c., formed themes for many a volume. The ancient Hindus were great observers of nature, and no branch of Natural Science escaped their observation, and the phenomena of nature they tabulated and wrote treatises on, mostly in verse; this being more adapted for the system of learning (committing to memory) then in vogue.

Printing was an unknown art then, and copies of these great works were possessed by only a few, either pupils of, or descendants of, the authors. Copying was attended with great difficulty, and the language and style was such that a single omission or addition of a letter or syllable was sufficient to greatly alter the original ideas.

It must be admitted that there are a good many incongruities in the writings of these ancient philosophers; but while some of these may have occurred in the original works, there is no doubt that many must have crept in in the frequent process of transcribing the treatises.

Some of the observations on the cultivation and treatment of different products may appear absurd to the modern agriculturist, but there is on the other hand a good deal on the subject of Agriculture that quite corresponds with modern theories and practices.

I shall notice here some observations on gardening given in the Brihat Samhita, an ancient Sanscrit work by Varahamira, who is said to have lived in the fourth century of the Christian era.

Varahamira, in the introduction to his work says:—"Having examined the vast works that have proceeded from writers from the time of Brahma downwards, I purpose to write a brief work embodying the substance of the same. The task is a pleasing one to me." In this work he has devoted a chapter to Agriculture, and from the above passage it is clearly seen that Varahamira's work was not composed of original information, but was compiled from other ancient works.

In this work, the soil and its preliminary treatment is referred to as follows:—"Soft soil is congenial to the growth of all trees; such a soil should be selected for the garden, and the sesamum plant (gingelly) should be first grown in it; as soon as the plant begins to bear blossoms it must be cut down."

The first priece of advice given here, that of growing gingelly on the soil and destroying it just as it flowers would appear to be absurd to those who are unacquainted with scientific agriculture. But this is evidently intended to prove the necessity of manuring, and to show that green manure is useful in a soft soil, and besides points out the principles of green manuring, by advocating the growth of a pod-bearing (in this case not leguminous) quick growing plant, with succulent leaves and stem, containing a good percentage of nitrogenous matter. The time of cutting down the plants is also rightly given,—"just as they begin to flower." In fact no better plant adopted for green manuring, and no better method could be advocated.

Then follows two passages in which certain directions are given regarding the propagation of plants. The first gives the names of some of the principal trees which are grown from seeds; the second runs as follows:—The jak, the asoka, plantain, jambu, breadfruit, pomegranate, vine, citron, &c., should be grown by planting either their roots after clipping them, or their branches smearing cowdung on the parts cut."

The above trees are more or less successfully grown by division or by cuttings, and the recommendation to smear cowdung on the parts cut is an excellent one, through the neglect of which many failures occur at the present day. It need not be cowdung, but any substance to prevent the rapid evaporation of the sap and the rotting of the parts cut that should be used.

Speaking of the best seasons for growing certain plants the author says:—"Trees that grow without branches shall be grown in Sisira season; and in the Hemanta shall be grown trees that grow without branches; in the Vasantha season shall be grown trees possessing good trunks. The year is divided into six seasons by the Indians, each consisting of two months, thus, the Sisira season extends from the middle of December to the middle of February; Hemantha, from October to December; and Vasantha from February to April."

Then the author proceeds to give the space that should be left between plants; this is of very great importance, seeing the neglect of this important operation among our native agriculturists, though they were taught by their ancient and honored philosophers to adopt a suitable plan. The passage runs as follows:—

"An interval of twenty cubits between trees is the best, one of sixteen is passable, and one of twelve is injurious."

"The trees that are planted very near each other get their branches interwoven as well as their roots, and such trees get choked and do not grow well."

The importance of irrigation and the desirability of watering trees whenever the soil is dry is forcibly laid down; and the names of some of the trees which thrive on wet soils is also given; among the list we find jambu, rattan, nauclea, pomegranate, vine, emberalla, jak, &c.

I shall reserve for my next a notice of the cause and treatment of plant diseases and of special manures and preparations which produce variations in fruiting, growing, &c.

BUILDING MATERIALS.

SECTION II. TIMBER *(continued)*

BY A FACTORY APPRENTICE.

It very rarely falls to the lot of the Architect to select timber whilst in a state of growth, but if such a need arises, he will, of course, choose healthy vigorous and flourshing trees. Preference should always be given to those in which the trunks are most smooth, since a swelling above the general surfaceis a sure sign of decay. That the condition of the roots of a tree is the best index to its soundness is well known, but yet dead branches, especially on the top, render it very suspicious. In felling trees the large branches should be first cut off, so that the tree may not be injured or strained in its fall, and the trunk sawed as close to the ground as possible. When felled, but not before, it has to be barked, trimmed of its branches, and left to season. Before, however, leaving it for this purpose, it is thought best by workmen to square it to prevent its tendency to split.

The pieces selected for building should possess straight grain, but there are pieces which are occasionally employed, for instance for knees and braces, wherein a curviliner direction of the fibres is extremely desirable. It may be generally stated that in the case of two equal-sized and seasoned pieces the heavier is the piece to be preferred.

The boughs and branches are never so good as the body of the tree; the larger are stronger than the small limbs, and the wood of the heart stronger than all. When green, wood is not so strong as when thoroughly dry, which it rarely is till two or three years after it is felled. Timber that contains much sap is not only weaker but decays sooner. Timber is weakened by knots at which by experience it is found that fractures most frequently occur: and it is important to the Architect to recollect that he should always reject cross-grained pieces. The life of trees, like that of men, has been commonly divided into three stages: youth, maturity and old age. When a tree has arrived at a mature age the proportion of sap-wood is small and the heart-wood is nearly uniform, and is hard, compact and durable, and this is the proper stage for a tree to be felled. A tree when felled in infancy contains a great deal of sap-wood; when not felled till it is on the decline, that is, till it reaches old age, the wood is brittle and devoid of elasticity, tainted, discoloured and soon decays.

In order that timber may be durable, not only is it necessary that it should be felled during maturity, but due attention ought also to be paid to the proper season of the year for felling.

(To be continued.)

PADDY CULTIVATION IN THE NORTH.

SIR,—Will you allow me through the medium of your Magazine to make certain suggestions with regard to paddy cultivation in Jaffna?

It is generally known that paddy cultivation in that place has proved a total failure during the last three years, and I think we may safely fer in that there is very little hope in the future of a successful crop there. The usual nature of the seasons seems to have changed, and there appears to be a tendency towards a lengthening out of the dry and a shortening of the wet season.

The average paddy crop in Jaffna is undoubtedly a poor one. True, there have been cases in which good crops of paddy have been reported, but the figures meant to denote high yields refer only to special cases, where a very small extent of land, on which more than the ordinary treatment and attention has been bestowed, is cultivated. I am led therefore to think, and that not without reason, that paddy cultivation in Jaffna cannot be a success. How then can Jaffna hold its ground? I say let it look to that which thrives in the North.

The fact that Jaffna has long been famous for its fruits and dry grains, such as peas, gingelly, chillies, varaku, kurakkan, maize, &c. cannot be denied. Grapes and mangoes, oranges and pomegranates are unrivalled for their quality. Good mangoes in Colombo are identified with Jaffna mangoes. Mr. Green, the indefatigable promoter of agricultural knowledge in the Island has in his Agricultural Primer rightly suggested the extension of fruit culture, as well as encouraged the cultivation of dhall in Ceylon. Jaffna ought to lead the way in carrying this advice out, especially as its soil suits the cultivation of fruits of superior quality and of leguminous plants.

The digging of wells in the usual way in the midst of every cultivator's land is essential to a place like Jaffna, to water his crops whenever the rain fails. I will not speak here of novel experiments such as the boring of artesian wells, which has engaged the public attention for some time past.

New implements of culture are notfor the most part suitable to the Jaffna soil, which is of a shallow limy nature, but there is nevertheless room for improvement in Jaffna. I would suggest that the cultivators should cultivate paddy and dry grains alternately, and give more attention to the latter—that is to say they should practise a simple rotation of crops. A rotation is carried on there to some extent, but in no systematic manner, and I propose that dry grains be cultivated, in turn, thoughout one whole year.

Hitherto dry grains were looked upon as something secondary, but in fact, they are of primary importance in Jaffna, and ought to be considered such, as the *dry* season is predominant there. The Jaffna farmer has hitherto considered himself to be the cultivator of paddy, and to cultivate it was his chief aim and ambition. Hereafter his chief object must be to engage himself in the cultivation of dry grains (which is sure to remunerate him amply) and not to waste his time, strength and capital in his vain endeavour to secure a few bushels of paddy each year. The dry season is sure to come every year, but the wet season, almost as a rule, disappoints him. Therefore, he ought to ponder over these facts and betake himself to a more extended cultivation of that species of grain which is suited to the conditions of soil and climate in this district. By doing this Jaffna will find itself in a better position than now, and by gradually dropping the cultivation of paddy, will in an indirect way, help to abolish the paddy-tax!

R. M. C.

GENERAL ITEMS.

Mr. T. W. Goonewardene, Agricultnral Instructor at Kolonna, writes:—Kolonna is a small village situated fifteen miles to the east of Rakwana, and consisting of about sixty dwelling houses surrounded by hills on three sides. The average temperature may be fixed at 82°, and the rainfall, as calculated last year, 50·38. The small rainfall at present is no doubt partly traceable to the destruction of the forests for chena cultivation. The inhabitants depend mainly on kurakkan, and, to a smaller extent on paddy. They devote most of their time to chena cultivation, owing no doubt, for one reason, becsuse it is less troublesome than paddy cultivation. Parangi and fever, whether due to the common diet of dry grain and elk's flesh or other causes, are very common among the people. Both clayey and sandy soils are found in the district, and these overlie a dolomitic limestone formation which is seen on the sides and bed of the river. The natives burn this limestone and prepare lime for washing their house walls. There was hardly any rain during January last, and the drought coupled with the prevalence of fever makes it hard to carry on any experimental cultivation on a large scale. There is also no tank to which we can look for water to irrigate the fields during the dry seasons. There are only two tanks in the korale, one near Maduwanwela Ratemahatmeyas' residence, the other at Hulandawa. The R. M. is doing much philanthropic work, and the poor and afflicted inhabitants owe much to him as well as to Dr. Vethecan. I have been engaged in preparing a piece of land for the cultivation of dhall, which I shall endeavour to popularise among the inhabitants as a nutritious food.

Mr. Juanis writes from Nildandahinna. The weather at present (March 3rd) is very warm, there having been no rain for two weeks past. This sudden drought and heat is most inopportune, and not having been calculated on, is doing much harm to the young crops, especially those in hilly places where it is so difficult to water them by the hand. If there is no break in the weather before long, and the drought holds out for a month or two, the paddy crop must prove a total failure, and the people must look for bad times owing to short food supplies. The dhall and arrowroot I planted are holding out well, under adverse conditions.

Mr. Jayasuriya, head-teacher Walapane, sends a translation of a curious "disquisition on water" from the "Yoga-arnawa" of Meyrupada, an eminent and learned priest who lived in the reign of Prakrama Bahu III. A. D. 1267:—

Of all waters rain-water is the best—it is light, promotes appetite, destroys the three *dos* (viz., bile, phlegm and wind), and is an antidote for poison. The same when it enters into the earth, wells, &c. acquires different tastes and loses much of its virtue. The water of rivulets is tasteless, but it produces flatulency; that of lakes is sweet and light; that of tanks prevents both phlegm and flatulency, that of ponds promotes flatulency, that of pools is tasteless and induces hunger, that of waterfalls and rapids is light and destroys phlegm, that of wells promotes hunger and flatulency, that of water-springs destroys bile, and that which proceeds from mountains, washing them in its course, as well as that contained in natural lakes, causes pulmonary diseases, affections of the head, boils in the necks, &c. River-water which flows eastward is light, and that which proceeds westward is heavy; the same if in a muddy locality is heavy, but in stony places is light. The water of a first shower of rain, by reason of its coming in contact with dry organic matter, and engendering worms and insects, produces coughs, cold, asthma and inflammations. Rain water should not be used during autumn, since it is said to fall on account of serpents. But above all, let not water teeming with animalculæ or filthy water, or water mixed with *sevel* (Valisneria) in stagnant pools, or water which has seen the light of neither the sun nor moon, be used.

The following answer is given to a correspondent to the Agricultural Journal of Cape Colony who puts the query, "Has the Banana seed, and can it be propagated from seed as well as from the tuber? Also at what age does it begin to bear?":—

Answer.—The Banana, like most plants cultivated from time immemorial, has altered enormously from the wild form. There are dozens of varieties; and the ones most prized are those absolutely without seeds. Obviously such plants can only be propagated by vegetative method, analogous to cuttings, suckers, layers, &c. The custom is to allow the stem of the year to ripen its fruit, then to cut it down a little above the ground. A little mulching of old banana leaves is heaped loosely at the base, and in a few weeks new shoots spring up from the side of the old stool. The largest of these shoots has been known to show bloom in the third month after appearance above ground. But if the major part of the old stool is cut away and the root mass or rhizome be transplanted, it will not show fruit till the tenth and eleventh month. Some varieties of Banana, however, have seed. Finlayson, in his Siamese Journey, found examples of cultivated bananas with a few seeds, and mentions a wild sort full of seed, but deficient in pulp. (Journal Voyage to Siam, London, 8vo., 1826, p. 56.) Meyer describes the "Plantano de Pepita," in the Island of Luzon, which though propagated as usual by shoots from the rhizome, is full of fertile seed, and is good eating.

Practically, at the Cape and Natal, shoots are the only mode of propagation. Even if seeds were obtained the result would be unsatisfactory, as the seedlings would be sure to "throw back," or revert to the wild state, more or less. This custom of using seedlings of orchard trees for fruiting, instead of for stocks to graft on, is ruinous to the character of Cape fruit, and accounts for our mostly tasteless apples, our leathery peaches, and thick-skinned oranges. I have known a banana shoot bear in the third year, but it is mostly a question of climate.

An excellent remedy for hoven in cattle is said to be carbonate of soda. The soda—one ounce—must be given in a bottle of warm water and *slowly* poured down the throat. This is recommended even for horses.

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TEA AND COFFEE IN CEYLON.

UPS AND DOWNS—CONTRADICTORY EXPERIENCES—FARMING VICISSITUDES IN ENGLAND.

LAST mail brought us the following pertinent criticism and enquiries and interesting notes from a Ceylon proprietor now at home. They will be read with attention by planters, especially the information given about farms in England:—

"The *Ceylon Observer* of the 5th Feb. has been my study today, and I am much struck with the conflicting accounts of the tea and coffee industries. Why should the proprietors of Brae group part with their apparently valuable property for £4,500, when the Yatiyantota Company can pay 25 per cent dividend? Unless I am much mistaken Mr. Hugh Fraser was specially complimented in your columns of the *Observer* on his good fortunes in Brae?* Again in Haputale bug is reported to be disappearing and some quite phenomenal crops are reported—thousands of bushels in fact. Accounts from Madulsima however show that bug is *very* bad on the small acreage of coffee left. A similar report comes from Udapussellawa.† Wilson and Smithett have just sent me a sample of some ——— (Uva) peaberry which made 136s per cwt. This is 9s. over the highest price, which ——— (Uva) coffee ever made, when comparatively healthy. From what my manager says, however, I cannot think that coffee will ever pay for money bestowed upon it. A crop is a mere chance.

"Cinchona seems to have become like a broken reed—and no wonder, when quinine is quoted at 11d per oz.! I believe chemists still charge from 3s 6d to 5s. When do you think that we shall have a railway into the heart of Uva? Is it not nearly 20 years since the first agitation? Enough to break *stout* hearts."

[Yes indeed: our first Memorial was in 1872, but our correspondent will be glad to hear that the line—not merely to Haputale, but to Bandarawala with a new and fairly level road to Passara—should be open by September 1892.—Ed. *T. A.*]

"What very poor prices, they seem for estates in tea compared to the prices paid for coffee estates in our prosperous days, such as Monaragala £70,000, Wallaha £27,000, old Sylvakande £15,000, Alice Holt Group £75,000, Ceylon Plantations Co. Group £50,000, Doomoo £14,000, Forest Hill ditto, Yapame £18,000, and jungle at R280 per acre!

"All I can say is that these vicissitudes are not peculiar to Ceylon. The finest grazing land in England can be bought at about £30 to £40 per acre—very often 20 years purchase on the reduced rents—and land in Essex is at this present moment abandoned. It is like a jungle, and homesteads and cottages are falling into ruins.

"I have just been over a farm of 88 acres in this county which let at £150 and £130, and the rent is now £60 per annum. The outgoings are about £30 p. a. The craze is laying down land to pasture to escape expenses, and over a great deal of this land one can "whip a mouse" at all seasons.

"Farmers and peasantry are being rapidly ruined, and the 'Deserted Village' is no poetic imagination."

* True, and Brae in tea has done well and promised to do better; but Mr. Fraser had absentee partners who wished to realize, we believe.—Ed. *T. A.*

† True again: Haputale coffee is wonderfully free from bug, while it is very prevalent beyond the patanas on Udapussellawa coffee at present.—Ed. *T. A.*

BAD TEA SENT FROM AMERICA TO AUSTRALIA.

A telegram in an Australian paper, dated Melbourne, March 5, runs:—

Two hundred and fifty chests of bad tea per "Tsinan" have been returned from Sydney. The tea was shipped in the United States and was recently condemned in Melbourne. It is understood that the United States Consul will prevent the tea from being landed in the United States.

A German inventor proposes to make boots with stone soles. He mixes with a waterproof glue a suitable quantity of clean quartz sand, which is spread on the thin leather sole employed as a foundation. These quartz soles are said to be flexible and almost indestructible, while they enable the wearer to walk safely over slippery roads.—Ex.—*Indiarubber Journal.*

THE AMSTERDAM CINCHONA AUCTIONS.

Amsterdam, Feb. 26th.

The following are the analyses of the cinchona bark offered here today:—The manufacturing bark contained about 9 tons sulphate of quinine, or 3·86 per cent., on the average; about 1½ tons contained 0-1 per cent. sulphate of quinine; 20 tons, 1-2; 42 tons, 2-3; 65 tons, 3-4; 60 tons, 4-5; 19 tons, 5-6; 8½ tons, 6-7; 9 tons, 7-8; 2 tons, 8-9; 2 cwt., 10-11; 1½ ton, 12-13 per cent. Of the total quantity offered 2,385 packages were disposed of at a decline in prices, the unit averaging barely seven cents, or not quite 1¼d. per lb. The following was the range of prices: Manufacturing barks in quills, broken quills, and chips, 8 to 91 cents (1½d. to 1s. 4½d. per lb.); ditto root, 15 to 50 cents (2¾d. to 9d. per lb.); druggists' bark in quills, broken quills, and chips, 14 to 140 cents (2½d. to 2s 1d. per lb.); ditto root 12 to 13 cents (2¼d. per lb.) The principal buyers were the Auerbach and Brunswick factories.—*Chemist and Druggist.*

COFFEE IN NEW CALEDONIA.

The *Fiji Times*, in advocating the revival of the coffee enterprise in Fiji, notices its success and probable extension in the French convict settlement of New Caledonia. We quote as follows:—

Another matter, which was almost abruptly abandoned before it had received a fair trial on anything like a comprehensive scale, also might well come to the fore. That is—Coffee. Notwithstanding the effects of the disease to which it is subject, there can be no doubt that it can be made a highly profitable production. Fiji need not look far for assurance in this respect. Her near neighbour, New Caledonia, is making a success of it. From a recent number of the *Times*, we learn that "in an official report upon the condition of that colony the Governor states that agriculture, which has hitherto been of only secondary importance, seems to be entering upon a period of rapid development under the influence of the fresh means of action afforded it by the immigration from the New Hebrides, and New Caledonia will produce in this year (1890) 400 tons of coffee, while it is expected that in four years' time the production will exceed 1,000 tons * * * The Governor reports that what New Caledonia is most deficient in is labour, but he adds that the work done by the convicts, especially at the Thio penitentiary, is much more satisfactory than that of the convicts in Guiana, while the men who have served their time and who choose to work can always find employment at wages of from 4s. to 5s. a day, while at piecework they in many cases earn 10s. a day."

It has been proved beyond question that this colony can produce coffee in perfection. Machinery is here, and skilled knowledge. Yet coffee ceases to count among the exports and home consumption has become a thing of the past, simply because the industry has been given up. It is puzzling to arrive at a comprehension of why this should be. Of course there is the ready answer that it "does not pay." But why should that be the case. If New Caledonia can grow at a profit why cannot Fiji do the same. That the French settlement is doing this may be gathered from the expectations entertained of progressive production. An anticipated increase at the rate of 150 tons per annum is by no means despicable; while at the same time it warrants the belief that no oversanguine estimate has been made. It means a lot of money, however, and this colony is not so superabundantly supplied with that evil of life, but that she can cheerfully bear a heavier burden.

So far as labour is concerned, no reason exist why Fiji shall not be reckoned as on a par with New Caledonia. If growers there can afford to pay reasonable wages and find a fair margin of profit, why should not similar conditions prevail here. Soil is at least as fruitful and climate quite as favorable. In fact, it would be hard to state wherein this place is not at least equally well-off with her neighbour in those constituents.*

* So far the Fiji journalist,—but not a word is said as to whether leaf disease has reached New Caledonia. Its absence would make all the difference in the world.—Ed. *T. A.*

PORTSWOOD TEAS AND LOCAL SALES

The proprietor of Portswood is not inclined further to support local Tea Sales. His experience is not favourable as may be seen from the following extract which we venture to make from a letter before us, not however, written for the printer:—

"You know that some of us have often been asked to sell our teas locally. I have done it twice or three times and each time with a loss. At a recent sale in Colombo 86 66 and 57 cents were bid for Portswood teas—all were left unsold, being considerably under my values—but since the sale, they have been sold privately by the Brokers at R1, 72 and 62 cents and these prices are 1[illegible] to 17 cents under the *average net* price I received in London on 17th Feb. last. Why therefore should I continue to sacrifice the estate interests?"

THE TUTICORIN PEARL FISHERY OF 1890.

Pearl-oysters require rest; and after one fishing a pearl-bank is left in undisputed possession of the young oysters for a certain number of years, to enable them to grow and to settle down on the bed. Following the wisdom which teaches that some years' rest to the beds should be insured after each fishing, the officers and authorities who had the reviewing of the Pearl Fishery Report for the past year have allowed themselves sufficient rest and have proceeded in a leisurely manner to bring into perfection the pearl of a G. O., which now lies on our table. The first report of Captain Baker, the Superintendent of Pearl Fisheries, is dated the 20th of March last year, and his second report the 15th of May the same year. The Acting Collector of Tinnevelly submits his narrative of the Pearl Fishery to the Commissioners of Land Revenue on the 16th June, and the Commissioners submit the same with a review thereon to Government on the 22nd August. The Government deals with the Pearl Fishery on the 19th January of the present year, and the whole proceedings, after enjoying a comfortable rest in the Government office like the oyster on the recently fished up bank, come to us now.

The fishery, as appears from the report, was commenced on the 27th January, 1890, and lasted until the 8th March, when it had to be closed, as the divers went over to Ceylon. It was recommenced on the 23rd April, but it had to be closed again on the 4th May on account of a panic among the divers, two of whom had been bitten by sharks. The number of days during which the fishery was conducted was 40 and the Government's share of the takes amounted to 1,204,816 oysters. The price at which they were sold ranged from R16 to R36 per 1,000. The total amount realized was R24,701-5-10. To this amount has to be added R359-12-0, being the value of loose pearls and the sale-proceeds of the materials of the temporary buildings erected for the fishery. The charges amounted to R17,257-11-5, so that the net profit to Government was only R7,803-4-5. This is a very disappointing result, especially when compared with the net profit of R158,483 which was obtained during the fishery of 1889. The cause of these poor results as explained at length by Captain Baker are chiefly competition by Ceylon, the panic caused by the appearance of sharks, and the extremely low prices. The two last are to be regretted, but could not be avoided, say the Commissioners of Land Revenue. As regards the competition between the Madras and Ceylon fisheries, the Madras Government agrees with the Board of Revenue that effort should be made to come to some amicable arrangement. It is, of course, open to either side to bid for the services of the divers by the offer of better terms, but the Government declares that it would be most averse to entering upon any such system of rivalry, which in the end could not fail to be very disadvantageous to both Governments. This Government has accordingly decided to ask the Government of Ceylon whether it will consent to any arrangement under which the interests of both fisheries will be safeguarded. The questions of clandestine opening of oysters

and of clandestine fishing of the banks were also raised in the papers received by Government. There appear to be three sources of danger to be guarded against—(1) Poaching on the banks by a foreign vessel; (2) Poaching on the banks by a British vessel; and (3) Pilfering of pearls by the boats' crews whilst conveying the shells from the banks to the shore. The first, the Government observes, is a remote danger and may be disregarded. The second may possibly have some foundation of reality. So long as ago 1883 the belief was expressed that the banks were extensively poached but there is nothing on record to show to what extent such poaching was prevalent. Before taking any action in the matter, the Madras Government has resolved to address the Governments of Ceylon and Western Australia in order to obtain full particulars regarding the pearlfishery laws in those colonies. In the latter country it is said that "the fishing takes place in the main outside the 3-mile limit, and the colonial jurisdiction is not supposed to extend so far." With regard to the third difficulty the Bank of Revenue considers that when once the oysters have been raised to the surface and placed on British vessels by persons employed for that purpose by Government, they become the property of Government, and that if the pearls are thou abstracted, taken ashore, and sold, the offence is one of simple theft. In this view of the matter the Government is inclined to agree, and in any case by diminishing the value of the produce to be shared between themselves and the Government, the divers are guilty of cheating. The provisions of the Penal Code, the Government considers, are therefore sufficient to meet the case.—*Madras Times*, March 10.

THE W. P. A., in its usual go-ahead manner, has offered a prize of R200 for the best essay on tea cultivation, of practical local value. The point on which it requires particular and reliable detailed information is the best manner in which a Factory on the Joint-Stock Principle can be worked. Essays are to be sent to Mr. Hockin of Vayitri, S. Wynaad, before 1st June.—*Madras Times*, March 18.

WYNAAD PLANTING NOTES, March 12th.—Last month the rain came down heavily, measuring in some places, as much as two inches, though the fall was very partial, and from what I hear, I fear was insufficient in some parts. The Vythery and Sultan's Battery districts were especially favoured; and the result has been a very fine and healthy blossom which, to all appearance, has set satisfactorily. A great quantity of backward spike is now maturing, and we shall soon be crying out for more rain to bring out our second blossom. So far crop prospects are exceedingly favourable, but so many ills is coffee heir to, that we cannot feel sure of our future, until much later in the season. The heat is very great here now, and the drought is severely affecting the locals; wells are being dug in the paddy flats, and in some of the pardies the people are actually suffering from want of sufficient water to drink. This, of course, is also a bad thing for the now clearings, and a great number of young plants will be destroyed. In spite of the heat and dryness (attributed to the failure of the North-East monsoon), our old coffee is looking remarkably well, and throwing out quite a flush of young leaves. Two of our community, each on his own account, are working hard at experiments for the destruction of leaf disease. Both seem hopeful on the subject, and even should they fail, are deserving of our gratitude for their praiseworthy efforts on our behalf. Wynaad is not particularly lively just now, but the "submerged tenth," of us who *can't* get away even to the hill tops, contrive to meet once a week or so for tennis, and general sociability, and it is certainly pleasant to catch the cheerful drifts of conversation. "Glad to hear you had such a splendid blossom"—"never saw anything like my spike," and so on. It feels like getting one's head above water once again. I hope that my next will be a further record of things, and that I may be able to report that another good rainfall has brought out a second blossom, nearly if not quite equal to the first.—*Madras Times*, March 18.

THE CULTIVATION OF PADDY has been shown to be an unremunerative concern. Not only so, but in a congested place like Jaffna where everything depends upon the periodical rains the chances of success are few and far between. Then let our young men launch themselves into other pursuits. Nothing enriches a people or a nation so much as successful commerce. But if trade or commerce is to be successfully pursued, our young men should fully realise the power of association and the value of mutual confidence as the chief conditions of success on any large scale.—*Com.*

PLANT DISEASES.—Professor Plowright's lectures at the Royal College of Surgeons have been delivered this week. The first was devoted to generalities, and to the effect of fungi in producing over-growth (hypertrophy), from irritation or wasting (atrophy), by depriving the plant of its natural food, and appropriating it to its own use. Various illustrations were given. The second lecture was devoted to the Potato disease. As we shall be in a position to publish these lectures with numerous illustrations, we forbear from further comment at present.—*Gardeners' Chronicle.*

WYNAAD PLANTERS' ASSOCIATION.—From proceedings of a general meeting held at Vayitiri Jubilee Hall, 4th March. Present—Messrs. Atzenwiler, Batty, Boosey, W. F. Brown, Chamier, Hockin, Lamb, McCabe, Powell, Ramsay, Rosling, Taylor, Trollope, Walker, Winterbotham and J. F. Jowitt, Acting Hony. Secy. Mr. Hockin in the chair. *Leaf Disease.*—Read letter from the Honorary Secretary to C. E P. Veruede, Esq. in reply to his offer to come to Wynaad. Also Honorary Secretary's letter to Dr. McCabe thanking him for his Essay. Likewise letter from the Honorary Secretary to the Chief Secretary to Government, Madras, asking the Madras Government to be good enough to forward an application on the Association's behalf to the Government of India for the services of Surgeon Major Barclay on the special duty of further investigating Hemileia Vastatrix. Read also a letter from Mr. Murray together with an extract from the "Detroit Free Press" on the Washington Bureau of Vegetable Pathology. Resolved that Mr. Murray be thanked for the interesting article, and that the Honorary Secretary communicate with Professor Galloway in charge of the Bureau, bringing to his notice the disease our coffee is suffering from, and solicit his aid.

LIQUORICE.—In *A Modern Apostle: Alexander N. Somerville, D. D.*, by George Smith, C. I. E., LL.D., there is an interesting account of the manufacture of liquorice as witnessed by Dr. Somerville at Sokia, near Smyrna. In his (Dr. Somerville's) own words—"The juice is extracted by machinery, here and in America; for the firm (Messrs. MacAndrew and Forbes) has a factory there, and exports from Asia Minor a large quantity of the root. Only a trifling amount now is employed for medicinal purposes; it is principally used for combining with Tobacco leaf to make 'Cavendish,' which is much in vogue with sailors. The whole valley of the Meander for above 100 miles is more or less overspread with diggers, men and women, extracting the roots from the ground, stacking them, putting them into bags, and sending them on to various stations on camels. I was led to understand that this gives employment to nearly 100,000 persons. Indeed, the business has an important influence throughout the district, by teaching the people habits of industry.......We went over the factory, connected with which are Scotchmen, Circassians, Turks, people from the Isle of Patmos, and Scala Nuova, near Ephesus. The manufacture of liquorice paste is accomplished by grinding down the root between ponderous mill-stones. James, observing in the yard some seventeen of the stones formerly used, and detecting in them a resemblance to the drums of colossal pillars, inquired whether they had not been taken from some antique structure, and elicited the information that the worshippers in the temple of Artemis, at Magnesia, in the days of Themistocles, had not been unfamiliar with them when occupying a very different position."—ATHENÆUM.—*Gardeners' Chronicle.*

CINCHONA CULTIVATION IN JAVA.

Mr. van Romunde's report on the Government cinchona enterprise in Java for the fourth quarter of 1890 states that the weather during the quarter was very abnormal. October and the first half of November being very wet; the second half of November being very dry with low temperature at night and frost in some parts; and December being characterized by alternate rain and drought. The drought in the latter part of November caused considerable damage to the young plants: but the loss can be made good by means of the large number of well-grown plants in the nurseries. The older plantations showed remarkably good growth during the later months; and the prospects for the crop of 1891 are therefore very favourable. The crop of 1890 amounted to 459,000 half kilograms of bark, of which by the end of December 364,123 pounds had been forwarded to Tandjong Priok. Though a considerable decrease in production has been experienced during the past year, this is certainly not to be ascribed to a diminution of the stock of bark in the plantations, but is found in the sparing to the utmost of the trees, specially of the ledgerianas after it was seen that very densely grown plantations were not attacked, at least not appreciably, by *Helopeltis antonii* or by caterpillars, which have caused such devastation of late years. The amount of bark in the plantations has therefore very largely increased during the past year, in spite of the unfavorable weather of 1890. On 2nd October, 6th November, and 11th December, sales of the bark of 1889 were held in Amsterdam, the unit prices obtained being respectively 9, 8 and 8 cents per half kilo. In November and December cinchona seed was sold by public auction, the gross amount realized being *f* 1,027 and *f* 792. In consequence of the small amount of dry weather in 1889 the supply of ledgeriana seed was very small, and the prices realized therefore far exceeded the minimum prices fixed by the Government. For one lot indeed so much as *f* 2 per gram was paid. The total number of plants in the Government plantations at the end of 1890 was 3,489,800, made up as follows:—In the nurseries 920,000, viz., 510,000 ledgeriana (including 10,000 grafts) and 410,000 succirubra; in the open 2,569,800, viz., 1,905,000 ledgeriana (including 265,000 grafts and cuttings, but exclusive of the more or less 3,000 original ledgerianas), 2,400 calisaya and hasskarliana, 605,000 succirubra and caloptera, 55,900 officinalis, and 1,500 lancifolia (among these about 1,000 *C. pitayensis*).

REVIEW OF CINCHONA BARK AT AMSTERDAM FOR THE YEAR 1890.

(Report by a Dutch Broker.)

Amsterdam, Dec. 1890.

The past year has been one of great importance for the Amsterdam cinchona market, in the struggle for precedence with London as market of the world; our market may be looked upon as the victor.

Much has been contributed to this result by the energetic leadership of the founders of our cinchona establishment, who from the beginning, have taken care that everything could be done to the bark received here, which would tend to promote a favourable sale. The untiring energy with which growers are made acquainted with possible improvements and economy in their productions, has been attended with marked result.

Both buyers and sellers have become convinced that our market offers advantages which are not to be found elsewhere. Each package can be inspected and sampled three weeks before every sale, and of every parcel an analysis is made and published by non-interested analysis. In addition to this the charges to all parties interested have been calculated on a very low scale and are very much less than in London or elsewhere.

From the subjoined tables it will be sufficiently clear how much the trade in this article has increased here. When taking into consideration the average strength of the Java bark and that of the barks offered in London, it will be clearly seen, from a comparison of the turn-over of both markets, in which direction our market is progressing.

At the end of the year our stock in first hand only consisted of about 2,000 packages, being for the greater part arrivals which came too late for the December sales, and partly lots left over from previous sales. This quantity does not comprise the Government barks intended for the public sales in 1891. The stock in second hand is not worth mentioning at least as far as the factory barks are concerned, whilst the stock of pharmaceutical barks is if anything smaller than at the beginning of the year. Notwithstanding the important increase in the arrivals, we yet find here a stock too small to be of any importance, whilst the stock in London is continually decreasing. It appears therefore that so far the demand for quinine has kept pace with the increased productions. Whether this demand owes its origin to an increased consumption (as many think) or whether it is attributable to an increase in the number of speculative buyers, it is difficult to say. So much, however, is certain that in the first case, the low basis which cinchona bark has reached would be perfectly unjustifiable, and the position would have to be attributed to abnormal relations and influences which interfere with the natural course of events.

FACTORY BARKS.—The handling and packing in Java now leaves very little to be desired, and the arrivals this year were again in both respects much better than formerly. Occasionally parcels were met with, which had been insufficiently cleared of wood and fibres which causes distrust amongst the buyers. Bales insufficiently filled are now very much the exception. In Java the importance has been well understood of carefully mixing the barks before putting them in the bales, by which process the bales of every parcel show equal quality. Shippers whose marks have been treated with special care in this respect, will have experienced the advantages of this mode of treatment.

In January the market was very firm and in the first public sale everything was sold at an average unit of about 10 cents, quinine was sold in that month at, from 1s $2\frac{1}{2}$d to 1s 4d per oz. (f. $25\frac{1}{2}$ to 28 per kilo.) This favourable tendency continued until shortly before the March auction, when quinine dropped to 1s $1\frac{1}{2}$d (f. $23\frac{3}{4}$), and the unit after having reached ± $10\frac{3}{4}$ ct. in the February sales dropped to ± $9\frac{5}{8}$ ct. In the May sales a slow market was experienced with falling tendency and the average price realised was only $9\frac{1}{4}$c.

In June and July larger transactions took place in quinine at lower prices (12d f 21) and the two sales only realized ± $8\frac{3}{4}$c. and $8\frac{5}{8}$c. respectively per unit. Before the August sales an improvement set in which caused the average unit to rise to ± $9\frac{3}{4}$c. but in the October sales under the influence of low offers of quinine for forward delivery, the value again fell to a unit of about $9\frac{1}{4}$c. The November sales the largest of the year were held at a bad time. The financial situation was unfavorable, general distrust and want of activity was experienced, all of which led to a drop and quinine was offered at $11\frac{3}{4}$d (f. $20\frac{1}{2}$). In this sale not more than 8c. per unit could be made, at which price 703 packages were taken out whilst 409 packages had been withdrawn before the sales. On the same day however the greater part of the barks taken out were sold privately at secret prices.

In December the tendency became if possible still more unfavourable; quinine was even offered at $11\frac{1}{4}$d, but the low price brought apparently an increased demand. In the last sale of the year everything could be disposed of, at an average unit of $7\frac{1}{2}$ct. and after this

sale the tendency of the article has slightly improved.

PHARMACEUTICAL BARK.—Succirubra was freely offered but it must be observed that there were many parcels amongst them, which were bought by the factories as "fine dust" with a relatively high percentage of sulphate of quinine, and which therefore ought to rank as factory barks.

QUILLS.—Fine, silver-grey, quills well covered with moss fetched continually firm prices and larger shipments of these would undoubtedly be welcome. The highest price was paid for a parcel of officinalis stem bark quills, only 25 centimetres in length, but of a beautiful typical appearance and well grown over being f. 1·15 per ½ kilo. Inferior qualities will no doubt have frequently given disappointment to growers when sold here. When the bark is dark and smooth without moss or silvercoat it does not pay to make it into quill shape; it is more advantageous to grind these barks to dust. In the case of fine but thin bark of good colour, which it is desired to ship as quills it is advisable to pay less attention to obtaining long quills, but to roll them well (not too broad, but straight pieces, well assorted and convenient for packing in cases). The result obtained by a few shippers with produce of only average intrinsic value but which had been prepared with great knowledge and care, has proved the great advantage that can be derived in this way.

BROKEN QUILLS AND BOLD DUST.—Succirubra, in bold thick pieces, coated with moss and little dust always finds ready buyers at relatively high prices. Except from the Government plantations, where very old trees are found, very few parcels of the desired quality appear on the market. Thinner younger bark, if of good colour and free from dust, such as private growers can also furnish also finds buyers however at comparatively good prices. C. Schukkrafti, on the contrary remains low in price. H. A. VAN OVERZEE, JR, Broker.

AN ACTION ABOUT CINCHONA BARK.

A PLANTER COMPLAINS OF HIS COLOMBO AGENTS FOR HOLDING HIS BARK CONTRARY TO INSTRUCTIONS.

Baker and Hall v. *E. P. Wilmot.*

(D. C. Colombo No. 1,027.)

This was an appeal from the judgment of Mr. J. Grenier, Acting District Judge of Colombo.

Mr. Wendt (Mr. Dornhorst with him) appeared in support of the defendant's appeal.

The Attorney-General (Mr. Browne with him) for the plaintiffs, respondents.

Mr. Dornhorst replied, and the Court took time to consider its judgment.

On 4th March 1891 the following judgments were delivered :—

DIAS, J.—The defendant in this case is an estate owner, and the plaintiffs are Colombo merchants. It was agreed between the parties that the defendant should forward to the plaintiffs at Colombo his cinchona bark, and that the plaintiffs should cure, prepare and ship it to their agents in London for sale; that the plaintiffs should draw on their agents against the bark, and the proceeds of the drafts should be paid over to the defendant, and if the bark when sold in London should fail to realise sufficient to cover the drafts, then the defendant should make good to the plaintiffs the deficiency, with the usual mercantile charges. Accordingly, from 26th Dec. 1887 to 10th April 1888 cinchona bark was sent by defendant to the plaintiffs who shipped it to London, for sale, which resulted in a net deficiency of R5,240·93, of which the defendant paid plaintiffs R1,500, leaving a balance of R3,740·93 in favour of the plaintiffs, and this action is brought to recover that amount with interest. The contract as it is set out in the libel is not denied, but the defendant adds another condition to it, which is that the plaintiffs should not sell the bark for any price less than 3d per unit of sulphate of quinine in each bark, the unit being one per cent of the weight of the bark. The defendant says that till Nov. 1888 the plaintiffs held in London 23,765 lb of the defendant's bark, and that in December 1887 and Jan. 1888 the market price for such bark was 3d per unit, when it was the plaintiffs' duty to sell, but they did not and sold in Oct. 1888, when the market price had fallen to 2d per unit—that if the bark had been sold in Dec. 1887 and Jan. 1888 it would have fetched £508 13s 3d, the plaintiff's claim would be less by R2,788·48, and the difference in favour of the plaintiffs would then be R748·02, which the defendant brings into court. There is also a claim in reconvention by the defendant, which in the view I take of the case need not be noticed. In the replication the plaintiffs denied the new contract set up by defendant, and they also denied that in Dec. 1887 and Jan. 1888 bark like the defendant's was worth 3d per unit.

Two questions arise for consideration, viz. (1) whether the plaintiffs were expressly prohibited by defendant from selling below the 3d., and (2) whether the market price of cinchona like the defendant's in Dec. 1887 and Jan. 1888 was 3d per unit. The correspondence between the parties has been summarised by the District Judge, and the result arrived at by him is that the defendant gave the plaintiffs a discretion as to the price, and this finding I think is fully borne out by the letters. On the second question the evidence is all on one side. It appears that by a mere accident the price of cinchona in the London market on the 6th December 1887 had reached the figure 3d, but when we come to consider the circumstances under which public sales of cinchona bark are held in London, the plaintiffs cannot be expected to forsee that on a particular day in the month of December Cinchona bark would realise 3d per unit. In a carefully considered judgment the District Judge gave plaintiffs judgment, and I am not prepared to interfere with it. Affirmed.

CLARENCE, J.—I think that the Judgment of the Court below is right. The evidence does not sustain defendant's averment that there was an agreement not to sell for less than 3d per unit. The letter of defendant, to which plaintiffs' letter of October 4th 1887 was the reply, is not before us, and all that appears is that defendant wished to get not less than 3d per unit, and plaintiffs then assented to let their London Agent hold the bark for the present, in hopes of the market reaching that price. The market afterwards about December 1887 momentarily touched 3d and then drooped. Plaintiffs, with defendant's approval, held on till October 1888, and then in despair of any improvement in the market sold for about 2nd. Nor do I think that the evidence discloses any breach of duty on plaintiff's part in selling under 3d. It is, I consider, sufficiently shewn that the rise in December 1887 was a sudden and unexpected rise of merely momentary duration and that, having regard to the time required for preparing lots for sale, no negligence can be imputed to plaintiffs in not having seized this momentary rise. Nor, indeed, am I satisfied that defendant's bark, if thrown on the market at that moment, would have commanded the full 3d rate. I agree that this appeal fails and should be dismissed with costs.—Local "Examiner."

SALE OF ESTATES.—The sale and purchase of estates in Ceylon goes on merrily, and hardly a week passes but we have to record properties changing hands, sometimes in the island, though often the purchasers are home capitalists the safety of Ceylon estates as a profitable investment having apparently at last become evident to investors at home. We hear for instance that a Syndicate at home is now in treaty for the purchase of the properties of Mr. F. M. Corbet which led to the now famous litigation with the Ceylon Company, while a telegram was received yesterday by Messrs. E. G. Harding & Co., to the effect that the estates in Rakwana of Mr. C. Shand—Barra, Rangweltenne, and Springwood—have been sold to a Syndicate, the names of whom were not mentioned, while the price is also unknown, but Messrs. E. G. Harding & Co., who have been appointed by wire to look after the interests of the purchasers, will know soon by mail.—Local "Times."

MEMORANDUM ON THE PRODUCTION AND DISTRIBUTION OF SILVER.

As it is now practically certain that no fresh Silver Legislation will be enacted by the present Congress, and as the new House of Representatives is not likely to be called together (unless for special business) till the 4th December next, our friends who are interested in Indian Exchange may like to see the following estimate of the Statistical Position of Silver:—

The following therefore is our Estimate for the current year's Distribution, assuming as in Table 1 that the total production is taken at 145,000,000 ounces viz :—

Table III. Ounces.

PRODUCTION OF SILVER (in ounces.)

Table I	United States	Rest of the World	Total
1887 ...	41,260,000 ...	54,917,375	96,177,375
1888 ...	45,780,000 ...	64,292,140	110,072,140
1889 ...	50,000,000 ...	75,988,671	125,988,671
Estimates 1890 ...	53,000,000 ...	83,000,000	136,000,000
Estimates 1891 ...	57,000,000 ...	88,000,000	145,000,000

The estimates for 1890 and 1891 are, of course, to some extent guesswork, but it will be seen that the ratio of increase has been put very considerably below that of the preceding years, though the stimulus to production afforded by the higher prices recently current would seem to justify very much larger estimates. For instance a Dalziel telegram from New York to *The Times* yesterday estimates the United States production for 1891 at 65 million ounces, against our estimate above of only 57 millions.

DISPOSITION OF SILVER.

The following figures are (approximately) summarized from the Report of the United States Treasury to Congress in December 1889, and refer to the previous year (1888).

Table II.	Ounces
United States Coinage and Certificates ...	26,000,000
Arts and Manufactures (for all the World, Soetbeer's Estimate)	16,000,000
Subsidiary Coinage, Europe and S. America	17,000,000
Sundries (unaccounted for)	6,000,000
China, India, and the East	45,000,000
Total for 1888 (as per Table I)...	110,000,000

PRESENT POSITION.

No more recent figures than the above as to the Distribution of Silver are obtainable, but we think it may be fairly assumed that the Consumption for Arts, Manufactures, Subsidiary Coinage and Sundries (unaccounted for) will be no more now than it was in 1888, looking to the rise in price. The purchases by the United States Treasury have however increased from 26 million to 54 million ounces, in consequence of last year's legislation.

United States Treasury Purchases...	54,000,000
Arts, Manufactures, Subsidiary Coinage and Sundries (unaccounted for) as in 1888...	39,000,000
Leaving for consumption by India and the East	52,000,000
	145,060,000

From the above it would seem that India and the East will have to absorb (even on the extremely moderate Estimate of production given in Table I) 52,000,000 ounces in 1891 against 45,000,000 in 1888, although Silver and the Eastern Exchanges are now higher than they were then. Moreover there is now a large accumulated Stock of Silver in the United States estimated at about 15 million ounces, which must also be disposed of. These considerations seem to indicate that Silver and Exchange must come down considerably in order to admit of the additional absorption.

On the other hand it must be borne in mind that the new House of Representatives which meets in December next is very differently constituted to the present one; they are largely pledged in favour of Silver Legislation, and the expectation that they will pass some strong enactment in favour of Silver is likely to sustain the price of it speculatively.

The following figures show the shipment of Gold and Silver from Europe to India and the amount of Council Bills for the last 5 years:—

Table IV.	Gold	Silver	Council Bills.* £	R.
1886 ...	819,201	7,044,477	10,292,692	13,53,25,369
1887 ...	1,984,739	6,577,748	12,136,279	16,70,03,150
1888 ...	1,308,232	5,854,533	15,358,557	21,81,23,993
1889 ...	2,103,381	8,189,210	14,262,859	20,89,91,221
1890 ...	3,283,375	8,825,771	15,474,496	22,41,86,638
	£9,498,931	£35,924,739	£67,524,903	R95,36,30,371

* For the Financial Year, viz.:—1st April—31st March.

The steadily increasing shipments of Gold to India constitute a noteworthy feature, as tending to decrease her balance of trade and consequent ability to absorb Silver.

ARBUTHNOT, LATHAM & Co.

33, Great St. Helen's, London, 26th Feb. 1891.

PINEAPPLE FIBRE IN THE PHILIPPINES.

Mr. F. W. van Eeden, director of the Colonial Museum sends us the following for publication. Mr. P. K. A. Meerkamp van Embden, our Consul at Manilla who sent us some fine samples of Pineapple fibre last year, which was prepared at Sorson, now furnishes us with an account of its preparation. The Ananas which was introduced here from Mexico about 300 years ago, is named in Spanish "Piña" (pronounced "Pienya") and has no other name in the native languages or dialects of the Philippines.

The plant bears fruit generally in the second year, sometimes in the third year, shortly before this takes place, the leaves which, by that time have attained their full growth, frequently a metre in length are cut, and their preparation begins immediately. Should the fruits be once formed, the quantity of the leaves deteriorates.

The preparation is simple to the last degree, the leaves are worked one by one, being laid on a smooth wooden plank, and scraped with a little earthen pan or dish until the fibre on one side of the leaf becomes exposed and can be carefully drawn out. The leaf is then turned over, in order that the fibre may be detached in the same way from the opposite side.

For removing the pulpy matter from the leaves a piece of coarse china pottery is commonly used, as good well made pottery would be too smooth. The fibre from the under side of the leaf is of finer quality and therefore of more value than that from the upper side. There now remains nothing more to be done than to wash the fibre and to bleach it in the sun until it becomes sufficiently white, though the color always has a yellow tinge.

Before being woven the ends of the threads are tied together, the knot is so carefully made, that it requires very close examination to discover it. Occasionally the ends of the fibres are united by means of starch, but this practice cannot be recommended, and is but little used because the fibres thus joined are liable to loosen.—Translated from the *Indische Mercuur* of the 21st February 1891, by J. D. Y.

[NOTE BY TRANSLATOR.—It is from this fibre that the beautifully fine "grasscloth" is made. The Ananas grows so well in Ceylon and most tropical countries that is seems strange that the Philippines seem to retain a natural monopoly of the very fine "grass-cloth." It used to be brought to Ceylon but I have not seen it for many years. It is a pity the Consul Meerkamp van Embden has not given any particulars as to the kind of Ananas which furnishes the fine fibre. Can you tell your readers whether it grows in Ceylon or not, every variety that has been introduced into this island seems to flourish wonderfully well?]

CEYLON TEA IN AMERICA.

We venture to take the following extract from a letter of Mr. R. E. Pineo, under date, New York, 23rd February:—

"Although I have not rushed into print I yet feel very keenly how misunderstood and how little appreciated in Ceylon my efforts here have been. It has not been easy work to get Mr. May to help us in our great cause, but I feel encouraged by what he is doing and am delighted that you appreciate and understand him through his manly, straightforward, honest letters that cannot but convince you how strong and conservative he is. We are making slow, but I think sure, progress; and, in time, I hope our work will be better known and appreciated by our friends in Ceylon.

"Our work is being honestly performed, and through us pure Ceylon tea is becoming known. We are getting agents, but as we are very particular about securing the right men our progress may be thought slow."

Mr. Elwood May's last letter to Ceylon, we may tell Mr. Pineo, certainly did not create a favourable impression as regards manliness!

THE CINNAMON TRADE.

The news we published on March 17th of the quarterly Cinnamon Sales held in London last month, was not very cheering to Proprietors. The supplementary information contained in our commercial columns yesterday, was not calculated to lighten anxiety. It will be seen from the prices realised, that some of the finest Marks, which always commanded top prices, fetched about the lowest prices. The explanation is, not that there has been any falling off in the quality of the spice turned out by the crack Estates, but that the higher qualities had to be bought in. Looking at the Sale Lists received on Tuesday, we find that of more than half the catalogue which failed to find buyers, the better part was fine Cinnamon. Thus, the only quality of the A. S. G. P. (Golua Pokuna) Mark which was sold, was No. 4. Of Firsts 28 Bales, of Seconds 41 Bales, of Thirds 46 Bales, and some even of Fourths had to be bought in. So with the higher grades of F. S. W. S. (Wester Seaton) and F. S. K. (Kimboolpitiya)—they found no buyers. Some part of these Marks was, we believe, sold subsequently at a decline of 2d. a lb. These Marks had long commanded 1s. 7d. to 1s. 8d. for their highest qualities—prices low enough, when far coarser Quills of the same classification fetched about double those prices, so late as 15 to 20 years ago. The highest price last month was fetched by the J. D. S. R. Mark; and that was obtained after the sale. The conclusion seems inevitable, from a study of the results of the last and the preceding sale (at which, too, a large quantity of the best Cinnamon had to be bought in) that buyers have decided on a maximum of 1s. 2d. to 1s. 3d. a lb. Unless, therefore, the manufacturers of fancy quills are prepared to reduce their prices by almost one-third, they must hold their stocks. The more important question, however, has reference to the future—Will Estates continue to manufacture Cinnamon of a quality for which there is no demand commensurate with the cost of preparation? There should be only one answer to the question.

When dealing, about a fortnight ago, with the note of warning sounded by a Voyangoda correspondent against fine cutting, as injurious to the productiveness or Estates, the thought occurred to us, that the need of manufacturing quills of extraodiuary thinness might cease by a falling off in the demand for them. We had not forgotten that at the November Sales the finest spice had been neglected; but, in view of the strong demand that there had been a few quarters before for fine qualities—medium and coarse sorts having shown a decline!—we hesitated to discuss a contingency which did not seem imminent. But the news brought Tuesday points to the probability that buyers have noted the continued overproduction of the spice, and have also, perhaps, discovered that bark of coarser make might serve their purpose almost as well as fine quills. Whether this feeling is temporary, or is likely to be established permamently, it is impossible to say with certainty; but experience with the downward tendency of prices for a long time past, and the ready market found for Chips, justifies the fear that growers must be prepared for a further fall. In these circumstances, it would be absurd to continue the manufacture of over-fine Quills, to the detriment of Estates. We have no faith, however, in combination; and fine manufactures, we fear, will continue to depress the prices for medium makes on one side, just as Chips have done from another. It is not easy to see a remedy, to avoid, on the one hand, the Scylla of deterioration of Estates, and on the other the Charybdis of over-production. One point seems clear, that extra-payment for extra fine quills should cease. If an arrangement be practicable, limiting 30 quills to the lb., the fall in price may be made good by an increased outturn, and by the revival of Estates.—Local "Examiner."

POLISHING WOOD.

The method of polishing wood with charcoal, now much used by French cabinet makers, is thus described in a Paris technical journal:—All the world now knows of those articles of furniture of a beautiful dead black colour, with sharp, clear-cut edges and a smooth surface, the wood of which seems to have the density of ebony. Viewing them side by side with furniture rendered black by paint and varnish, the difference is sensible that the considerable margin of price separating the two kinds explains itself. The operations are much longer and more minute in this mode of charcoal polishing, which respects every detail in carving, while paint and varnish will clog up the holes and widen the ridges. In the first process they employ only carefully selected woods of a close and compact grain, then cover them with a coat of camphor dissolved in water, and almost immediately afterwards with another coat, composed chiefly of sulphate of iron and nutgall. The two compositions, in blending, penetrate the wood and give it an indelible tinge, and at the same time render it impervious to the attacks of insects. When these two coats are dry, they rub the surface of the wood first with a very hard brush of conch grass (*chien dent*), and then with charcoal of substances as light and friable as possible, because if a single hard grain remained in the charcoal this alone would scratch the surface, which they wish, on the contrary, to render perfectly smooth. The flat parts are rubbed with natural stick charcoal; the indented portions and crevices with charcoal powder. Alternately with the charcoal the workman also rubs his piece of furniture with flannel soaked in linseed oil and the essence of turpentine. These pouncings repeated several times cause the charcoal powder and the oil to penetrate into the wood; giving the article of furniture a beautiful colour, also a perfect polish which has none of the flaws of ordinary varnish.—*Ceylon Advertiser.*

ANOTHER PAPER MILL FOR BENGAL.—A Calcutta paper says that a paper manufactory under the auspices of several respectable zemindars of Behar is to be started at Patna under competent European supervision, and with this view arrangements have just been completed in Calcutta to import the necessary plants and machinery from England. The services of a competent foreman are also to be imported from home, and a certain wellknown paper manufacturer of England has been addressed on the subject. It is anticipated that the venture will succeed, as Behar possesses an abundance of the raw materials suited to the manufacture of paper.—*Pioneer*, March 8th.

PRESERVING HEMP ROPES.—In order to insure greater strength in ropes used for scaffolding purposes, particularly in localities where the atmosphere is destructive of hemp fibre, such ropes should be dipped, when dry, into a bath containing 20 grains of sulphate of copper per litre of water, and kept in this solution some four days, afterward being dried; the ropes will thus have absorbed a certain quantity of sulphate of copper, which will preserve them for some time both from the attacks of animal parasites and from rot. The copper salt may be fixed in the fibres by a coating of tar or by soapy water and in order to do this the rope is passed through a bath of boiled tar, hot, drawing it through a timble to press back the excess of tar, and suspending it afterward on a staging to dry and harden. In a second method the rope is soaked in a solution of 100 grams of soap per litre of water.—*Indian Engineer.*

DARJEELING.—We have had a tolerably good fall of rain here, which has been pretty generally distributed throughout the district, and which it hardly needs to be said has done a very great deal of good in every way, more especially to crops of all kinds. This rain was, of course, exactly what all tea-planters were needing after such a long-continued drought as we have had; and I notice that everything has been freshened up by it. Snow fell at the same time all along the crests of the Singalela Range as low down as Tongloo, and, indeed, as I write, the snow has not even yet been entirely melted on the crest of Phalut. I notice that large consignments of "shooks" for tea boxes are arriving by the D.-H. Railway. Most, if not all, tea estates in the district are now-a-days obliged to import their box planking just as they have all along been obliged to import tea lead, solder and other stores required for manufacture, as the restrictions of the Forest Department are so great that it is cheaper to import box-wood than to obtain it locally. It is here that the metal boxes must tell in the long run, and judging from the brokers' reports these metal boxes have answered the purpose very well wherever they have been used.—*Indian Planters' Gazette,* March 4th.

THE DANGERS OF SUGAR CULTIVATION AND MANUFACTURE IN CUBA.—There being no sugar cultivation of much consequence in Ceylon, (the enterprise having proved a failure), we do not often quote *articles* referring to the sweet cane. But there is much of interest and value in exchanges which reach us. For instance, in the *Louisiana Planter,* just to hand, there is a letter from Havana, disclosing the special risks of the pursuit from fire in the field and steam in the factory. We quote as follows:—

We have, this week, to report a long series of sad events, consisting in several large cane fires, which seem to have commenced this year earlier than customary, and two terrible boiler explosions, which, besides inflicting heavy losses to the owners of the plantations on which they occurred, have also caused the death of several men and wounded a larger number. The plantations on which fires took place are: La Rosita, Alfonso XII, 160,000 arrobes; La Gabriel, at Nueva Paz, 150,000 arrobes; San Juan, at Roque, 100,000 arrobes; Mercedes, at Palmillos, 50,000 arrobes; colonies, Sangre de Dios, at Nueva Paz, 40,000, and San Ramon, at Jaguey Grande, 50,000 forming a total of 550,000 arrobes, equivalent to about 7,375 tons of cane that was burned, the greater part of which may as yet be converted into sugar, provided that it does not rain before it can be ground. By a strange coincidence, both estates on which a boiler exploded are called Merceditas, on the first one, situated at Melena del Sur, part of the sugar house and machinery department were torn to pieces and the death of six men and severe wounds to a great number were to be deplored, whilst on the second, situated at Bainoa, the damage was limited to the unroofing and part of the walls of the engine house tumbled over. With the exception of the fire on estate Mercedes, which was intentionally set, all the others seem to have taken place through carelessness.

THE SEA ISLAND COTTON of Tahiti is a beautiful silky fibre, but difficult to manipulate. We learn, however, that M. Raoul, a French colonist of Tahiti, has succeeded in growing a hybrid variety, obtained by crossing the sea island cotton plant with the wild cotton shrub of Guadaloupe. The journals of Tahiti give a glowing account of the fibre and the richness of the yield.—*Globe.*

BELLEVUE AND SINNEGODDE COCONUT ETATES.—The information we published, that Mr. Charles Byrde is the purchaser of these estates, was derived from a source that should have been well informed, but it is probable that the purchase was on behalf of Mr. F. W. Byrde who had recently dispesed of a Kelani Valley property of his. A correspondent writes: "It will be instructive to know that there was keen competition for those estates. The offers were as under—

R15,000 by J. P. de Vos.
R17,000 by H. J. C. Pereira.

R20,000 by F. W. Byrde per Messrs. Rogers & Co. R20,000 being the highest offer made, the sale was concluded in favour of Mr. Byrde—at the rate of almost R100 per acre."

PATENTS IN HOLLAND.—A good many years ago says the *Journal of Useful Inventions,* the Minister from Holland, at London, was consulted in respect to some proposed reforms in the patent system there. He replied there were no patent laws in Holland, and none were required, the arts in that country had passed beyond the period of discovery, and hence the improvements made by indviduals could not fairly become personal property. This is the substance but not the words of the story, and it contains a tolerably large suggestion, supposing the Dutch Minister to have been sincere in his views. A much better explanation, however, would be to say that the Dutch have so nearly abandoned the arts that a patent law there would amount to little more than a tax in the interest of foreign inventors. Looking at Holland of our day, it is hard to imagine that 300 yeare ago it was a kind of centre in Europe of skilled industry, inculding millwrighting, and so on. The want of fuel, water power, iron, and timber, has nearly put an end to such industry there, and to patents too.—*Electricial Trades Journal.*

THE GARTMORE FANCY TEA.—"The sale of a pound of Ceylon tea in Mincing Lane for £10-12-6 beats even the highest of the recent high records. The Gartmore Estate has achieved the costly honour of obtaining for a small lot of tea this extravagant price. A plantation which should be so reckless as to send to Mincing Lane fifty boxes of tea of equal value would not long escape bankruptcy. The method employed to achieve the result is even more wasteful than the process which the famous Soyer recommended for producing a juicy mutton chop—to skewer three chops together side by side and burn the two outer ones to cinders so as to obtain in the middle chop some share of the juice and flavour of its calcined mates. In plucking tea the practice is to pick the three top leaves of every tender branchlet; on plantations where quantity is in more demand than quality the topmost five are taken. The smallest, the most delicate in flavour of the three, or the five as the case may be, is the topmost, which is also the youngest and the least in size. By picking out this the rest lose that flavour which is necessary to impart the bouquet to the whole and sink into the lowest and almost unsaleable class of teas. The tiny leaf is so light and fills so small a space that a great number is required to make up even a pound or two. Nothing so wasteful of the gifts of nature has been devised by the wit of man since Roman epicures made ragouts of the tongues of nightingales, or drowned valuable slaves in fish ponds in order to procure lamprey of the finest flavour.—*Bombay Gazette.*

NITRATE OF SODA.

The transition from nitrogen-absorbing plants about which I wrote recently, is natural to nitrogen in its concentrated form as derived from the nitrates or saltpetre of Chile, the supplies of which may be rendered uncertain by the

WRETCHED CIVIL WAR

which has arrested the previously satisfactory progress of this leading South American Republic, although Peru and Bolivia also export nitrate of soda. There is an interesting article on the chief article of Chilian commerce,—the mainstay of its revenue, in truth,—in the latest number of the "Agricultural Gazette of New South Wales." Mr. Anderson, the Director of Agriculture of the above colony, believes that this valuable fertilizer has been formed by the decomposition of sea-weed and other organic matter :—

The nitrogen of which has become nitric acid by the process of nitrification, which acid has eventually formed nitrate of soda or Chili saltpetre. In its crude state it contains from 27 to 65 per cent. of the nitrate mixed with common salt, sulphate of soda, gypsum, and other impurities. After purification the commercial article is supposed to contain 95 per cent. pure nitrate of soda, or—in the language of analysis—it has a refraction not exceeding 5 per cent.

The exports from Chile rose from 729 tons in 1878 to 1,000,000 of tons in 1889, mainly from the discovery that the nitrate added so largely to the saccharine matter in beetroots. The results were the

ENORMOUS INCREASE OF EXPORTS

I have mentioned and the sinking of the prices of nitrate from £16 to £9 per ton and of beet sugar from 15s to 11s per cwt. To quote again :—

The manurial value of nitrate of soda is due to the 15·75 per cent. of nitrogen which this salt contains. It is extremely soluble, and therefore be used only on growing crops which can utilise it, and not allow it to be washed out of the soil into the drains.

Reckoning sulphate of ammonia, which contains 20 per cent. of nitrogen, at its Sydney price of £13 a ton, nitrate of soda is worth £10 5s a ton, and is therefore well worth experimenting with at anything under that price.

There is considerable rivalry between this salt and sulphate of ammonia as the two chief sources of nitrogen amongst artificial manures, but it is now generally admitted that on dry soils and on light loamy soils the former is to be preferred, on heavy clay land and wet soils, the latter. The nitrate has been proved to be of great value to all straw growing plants, especially wheat and barley, peas, vetches, lupines, clover, buck wheat, rape, sugar-beet, potatoes, celery, onions and linseed; with maize and tobacco the ammonia salt does better. Dr. Voelcker has shown at Woburn that $1\frac{1}{4}$ cwt. of nitrate of soda gave £4 8s 6d worth of wheat and 12s 6d worth of straw. With barley and potatoes also the results are very satisfactory.

Many farmers argue that nitrate of soda exhausts the soil, and therefore leaves it in a poor state for the succeeding crop. It will be at once seen that the larger it makes the crop the greater is the quality of mineral matter it must take out of the soil; but which is more valuable—the increased yield of grain and straw, or the few pounds of potash and phosphoric acid?

For example, 1 cwt. of nitrate of soda may increase a crop of oats by 3 cwt. of grain and 5 cwt. of straw, which will remove from the soil about 4 lb. of phosphoric acid and 11 lb. of potash; but the increase in the crop is worth about 25s., while the mineral matter can be replaced by 20 lb. of superphosphate and 1 cwt. of kainit for 4s 6d.

This points to the expediency of using nitrate of soda with some form of phosphoric acid, such as bone-dust or superphosphate of lime (which must be dry when mixed with the nitrate, or decomposition may ensue), and some source potash of such as the sulphate or kainit.

It is very valuable in enabling crops to resist the attacks of small parasites such as the beet-fly, turnip-fly, and fungi, owing, probably, to the rapid development of chlorophyll in the leaves by which the plants are placed beyond the destructive influence of those parasitic pests.

We cannot help thinking of the probable

GOOD EFFECT ON RICE

of an application of nitrate as we read :—

On a good mineral soil, $1\frac{1}{2}$ cwt. of nitrate of soda has been found to increase the yield of wheat from 27 bushels and 1 ton of straw, to 44 bushels of grain and $1\frac{1}{2}$ tons of straw,

For vegetable gardens and fruit orchards applications of this substance seem specially valuable :—

For the market gardener who wishes to raise immense crops of early vegetables, this manure has proved a great boon. Instead of applying 75 to 100 tons of stable manure per acre, and working the same in with great toil, he now applies 250 lb. of nitrate of soda and 500 lb. of superphosphate in early spring before drilling in the seed, and again 250lb of nitrate when the plants are a few inches high, and yet another similar dressing in three or four weeks. The results in promoting great growth and early maturity are surprising. Why? First, because this amount of nitrate of soda really contains more nitrogen than 25 tons of average stable manure would supply, and it contains the nitrogen in a form—nitric acid—*at once* available, whereas the nitrogen of the dung has to be changed into nitric acid for the use of the plant by the presence of lime or carbonate of lime or potash in the soil, and the slow process of nitrification—a process that depends on minute living organisms (bacteria) producing a ferment in the soil, and must have a proper proportion of moisture with a temperature ranging from 54° F. to 98° F. It can hence be readily understood how nitrate of soda acts so wonderfully in a drying cold spring, where dung or sulphate of ammonia may refuse to act. Hence also may be deduced the wisdom of applying dung in the autumn and the nitrate as a valuable supplement in the early spring. For early cabbages, cauliflowers, onions and celery, its value has been proved. With regard to fruit, it is of great service in promoting the formation of sugar and early maturity. A dose of $\frac{1}{2}$lb will often recover a sickly lemon or mandarin tree.

The article from which I have been quoting is followed by one on the cultivation of *Coffea arabica* in certain parts of New South Wales, where it grows well and is singularly free from disease. No doubt tea and coffee, like sugar, could be grown in many parts of Australia, but the

HIGH WAGES OF LABOUR

place an insuperable bar to profitable cultivation of such plants in competition with places where comparatively low priced labour is plentiful.

"TIMEHRI."—The December 1890 number of this journal of the Royal Agricultural and Commercial Society of British Guiana has the following contents:—Papers.—The Post Office in British Guiana before 1860, by James Rodway, F.L.S.; Fireflies, by Lady Blake, Jamaica; Statute Law Revision, by Dr. J. W. Carrington, C.M.G., Q.C.; The Necessity of Pure Air for Health, by E. D. Rowland, M.B., C.M., Edin.; Notes on the Geological Reports of British Guiana, by the Editor; On Parasites, by A. T. Ozzard, M.R.C.S., England; Contracts with Cane Cutters, by A. R. Gilzean; Notes on Scale and other Parasitical Insects, by R. Ward; On the Upper Berbice River, by the Editor; The Barbados Sugar Cane Experiments, by J. B. Harrison, M.A., F.G.S., F.C.S., &c. Occasional Notes.—Gold and Diamonds in British Guiana; Rice growing in British Guiana; Dried ripe Bananas; Scale Insects; Young Aboma. Reports of Society's Meetings, from July to December, 1890. List of Popular Science Lectures.

THE NEW TEA DRIERS:—THE MAN AND THE MACHINE.

The production of tea in Ceylon has now attained such dimensions that every improvement in the machinery or its manufacture must be of high importance to planters. The two or three inventors who are coining fortunes out of their patents can have by no means exhausted the possibilities of invention, and this truth they prove themselves by continually making so-called "improvements" to what were declared to be "perfect" machines only the year before. But this is a dodge common to most patentees, as profitable to themselves as its object is transparent and irritating, if—being satisfied with the original type,—you are unable to get its worn-out parts renewed because they have been "improved" out of existence. It is high time, therefore, that we had some more permanently perfect machine, more up to the work it is declared able to perform than as 50 is to 200. Concerning this fact I will tell a good story later on. Not having been able to be present at the public trial of Sharpe's new Drier, at Hangran Oya, and I was invited to a private view a day or two ago, and I then made the acquaintance of the inventor and his machine at the same time, and I now propose to give you some account of both in a free and easy manner. Owing to the inevitable "accidents" that always happen, that public trial was almost a failure. With the impetuosity characteristic of youth, these big men—Messrs. Philips and Sharpe (6 feet 4, and 4 feet 6 respectively)—hurried on the "trial day,"—a month too soon—with the inevitable result—partial failure. The machine itself is no failure, but its public exhibition was, and that without anybody being to blame, because Mr. Sharpe "wanted to get away," and the jobbing engineers failed to produce an essential part "till the very last moment," thus rendering anything like preparation impossible. The consequence was that the "report" sent to the *Observer* was the poorest stuff that ever flowed from the facile pen of that ready writer, while the other fellow who reported for the "Independent" got fits for his pains from the outraged inventor. I predict that those who avail themselves of a private view a month hence will form a more favourable opinion, and be forced to admit that a new Drier of great durability and capability has come quietly into the country, and has come to stay.

Personally, Mr. Sharpe is a genuine and interesting specimen of the British Working Engineer, to whom an intricate piece of machinery is as familiar and dear as his playthings are to a schoolboy. It is a gain to Ceylon to have such men amongst us occasionally, and unless Mr. Sharpe's interests are very extensive elsewhere, he would do well to settle in Ceylon, where there is plenty of room for competition in his line by really competent men. Anyone troubled with obstinate machinery refusing to do its fair amount of work would do well to invite Mr. Sharpe to take a look round his factory. Here 's a case in point:—Mr. Sharpe paid a visit to one of our largest factories, chokefull of all sorts of rollers, driers, packers, sorters, turbines, engines and the rest, with miles of belting whirling in every direction as might be expected in a factory where they turn out 5,000 lb. made tea a day, more or less. The manager, whom we will call Mr. Ponsonby, gave Mr. S. *carte blanche* to check the work done by any machine he liked. He fixed on the latest brand new "Horizontal Blower"—"Tea seed in at one end, and 300 lb. an hour of sorted tea packed in fancy canisters out at the other end," sort of Drier. Instead of 300 lb. he found it doing 50 lb. an hour (!) and almost bursting its boiler at that. Mr. P. thought there must be some mistake, but testing it again along with Mr. S. no more could be got out of it. "Fancy that," said Mr. P., "what 's to be done?" "Ah," said Mr. Sharpe, "What indeed? All the world knows by this time, that you can make good tea, but you can't be expected to know everything about machinery. I see there the fault lies plain enough." "Do you? What is it?" ["Well," said Sharpe, scratching his head, "I am at heavy expenses coming to Ceylon. Everybody has got his own business, and that 's mine. Any other machine I can test for you?" "Oh, bother any other machine," said Mr. P., "tell me what 's the matter with the 'Horizontal Blower,' and name your own fee." "Well, thank you, sir, R100 please."] "Call some coolies and masons"; and without touching the machine itself, Mr. Sharpe doubled its output on the spot. Before going further let me confess that the words enclosed within brackets are my own wicked invention all the rest being true. In point of fact, Mr. Sharpe most liberally did the job for nothing without a hint at a fee.

Perhaps *this* hint to the wealthy proprietors of that estate will not be thrown away—if Mr. Sharpe himself will forgive me for saying so—on the principle that the labourer is worthy of his hire. Such is Mr. Sharpe.

As for the Drier itself, he is still working at it, exercising such patience as the absence of his big shops and appliances at Lincoln render necessary.

Externally, apart from the inevitable furnace, it is a steel cylinder standing on the floor level 7 ft. or 8 ft. high, by 6½ ft. in diameter. Within revolve horizontally four trays, their centres being fixed to and turned by a vertical shaft, their circumferences being supported on a narrow fixed rail, on which they travel. Each of these rails has a "cut-out" part, at the proper place, which drops and raises sections of the trays, rapidly, one after the other, till in the course of one revolution each tray has discharged its contents on to the one below it, the tea being automatically delivered outside, from the bottom tray. At the trial only three trays were in operation, I am told, doing 60 lb. an hour. The construction of a fourth tray is that which is engaging Mr. Sharpe's attention now. All future machines of this size (the smallest size made) will have four trays, and the output be guaranteed at nearer 100 lb. an hour than a maund. So says Mr. Sharpe. The trays are not wire gauze, but thick sheets of galvanized perforated iron. Instead of its vital parts wanting renewing every year, I think it likely that, once put up, a machine will see the estate itself change hands before its own parts call for change.

R. W. J.

DR. GOEBEL, a well-known botanic scientist, has gone out to Demerara for the purpose of making a careful study of that curious pink flower, or rather lily, which is peculiar to the watercourses in that region. The plant, it will be remembered, excited some interest at the Colonial and Indian Exhibition in Kensington in 1886. It belongs to the order of Podostemaceæ, and generally it grows under the water, where beds of the plant can be seen. In the dry season, when the river shrinks and the plant is exposed, it takes advantage of the opportunity to flower and fruit. After the fashion of sea-weeds, it adheres to rocks by a disc-like root, and it holds its ground in the most violent rapids.—*Colonies and India.*

CEYLON TEA FOR AUSTRALIA.—Australian buyers are again suggesting that our teas for their market should be packed in 40 lb. packages, in place of the ordinary 50 to 60 lb. half chests. Dealers in the Southern Colonies are accustomed to the smaller boxes and no doubt prices slightly higher—1 or 2 cents per lb.—would be paid for tea in such packages. It might be worth the while of planters who look to sales in the local market to try some breaks in 40 lb. boxes. The danger would be that buyers for the English market would not compete.—Since writing the foregoing the following extract from a letter for "the Colonies" has reached us:—

"We would suggest to growers, who, we are sure, are anxious to meet the demands of the Colonial trade, that they pack a fair proportion of half-chests weighing from 40 to 45 lb. net. We feel sure that growers would obtain a higher price at the sales for good breaks (80 to 100 half-chests), medium to good medium, Pekoe souchongs and pekoes."

COCONUT BEETLES.

Mr. Hale of Tampin sends the following notes to the Journal of the R. A. S. about the coconut beetles, which seem worth recording :—

"The natives here (Tampin) have the following names for this insect in the larval stage *Lembetah* and *Kelematah.* The latter means "that which tickles the eye (sight being understood), and the former is probably derived from it." Kelemata, originally Gelemata, may, he thinks, be derived in the following way : —"Malay women are generally slightly hysterical, and seeing a lump of these larvæ wriggling about in a vessel would make a Malay woman squirm (I can find no better word) and would give her a feeling of being tickled which she would so express. The large millipede I have known to cause the same sensation to Malay men who are particularly nervous." This suggestion seems quite a possible one for the derivation. One may compare Forbes's account of his throwing a woman into a state of *latah*, by flicking a caterpillar upon her, and I have known a syce unable to look at a death's head caterpillar which I was carrying without violent shuddering and horror."

Mr. Hale adds :—"The larvæ are very much relished by Malays, and I myself ate several of them and found them particularly sweet and nice, having a flavour like a fried filbert. The way to cook them is to put them alive into a pan over a slow fire and fry them until they are crisp. In the process of cooking they exude a quantity of a clear sweet nutty-flavoured oil (100 larvæ will yield about half a pint). This is believed by Malay women to be a most excellent hair-oil, and is much used by them for that purpose to encourage the growth of girl's hair. The perfect insect is called Kumbang Jenti, Kumbang Kalapa and Buang, but all of these names are applied indifferently to other large beetles."

Mr. Ridley says, in the the same publication,

"Towards the end of last year, on examining the contents of a pitcher of the common pitcher plant *Nepenthes ampullacea*, Jack) which was growing in the jungles in the Botanic Gardens, I was surprised to find three larvæ of one of the mosquitoes living and apparently thriving in the water of the pitcher. Carefully cutting off the pitcher and keeping it in a bottle, I succeeded in two or three days, in rearing two of the larvæ to maturity. The mosquito larvæ are not very particular as to the water they live in is known to every one who has ever watched them, but it is certainly very remarkable to find them living and thriving in the Nepenthes, which is so speedily fatal to any other insect which chances to fall in.'—*S.F.Press*, March 11th.

MR. H. F. BLANFORD ON CEYLON.

(From the Hills.)

Mr. Blanford, in his "Elementary Geography of India, Burma and Ceylon," traces the Taprobane of the Macedonians, to "copper water." We have heard of the copper-coloured palms of Wijaya's soldiers who fell to the earth on landing in our island, but the copper water is new to us. We have always felt a strong inclination to believe in the botanical origin of the name, from the Tamana tree, whence Tamankaduwa, the forest of Tamana trees. It is interesting to be reminded that the area of Ceylon is three-fourths that of Ireland. In saying that all the Ceylon rivers save the Mahaweliganga are mere mountain torrents, Mr. Blanford is scarcely correct. The Walawe, the Kelani and the Mahaoya are good-sized rivers, the Kelani, indeed, being navigable for large-sized boats for some thirty miles from the sea. The Mahaweliganga is described as rising under Pidurutalagala, the reference being to the Nanuoya, which with many other affluents forms the Kotmaleganga, and joins the Adam's Peak branch at Pasbage, below Nawalapitiya. But the Agraoya which rises under Kirigalpotta and the Dambagastalawa which flows down the Elk Plains from Totapala. and which unite below the Agras, are really the chief sources of our greatest river, the Agraoya being the farthest from the sea. As a matter of fact the actual sources of the Mahaweliganga can be seen on the great table-land of Horton Plains, 7,000 feet above sea-level. Besides not knowing that our mountain railway has been now for some years extended from Nawalapitiya to Nanuoya and is being extended across our mountain system into Uva, Mr. Blanford was ignorant of the fact that Sir Arthur Gordon had added two further Provinces, those of Uva and Sabaragamuwa, to the seven enumerated in the geography. Kandy is not quite 1,700 feet above sea-level, instead of 2,000, although the mountains immediately surrounding the mountain capital rise to altitudes of over 4,000 feet. In the case of Badulla the altitude is represented by the curious combination of four figures 2, or 2,222 feet above sea-level. Cinnamon, no doubt, grows wild in our forests, but it is the cultivated spice which has been for many years exclusively exported. The price has fallen so low that it would not now pay to collect "Korle cinnamon." With the exceptions noticed the brief account of our island is correct. Our climate, and especially that of our mountain sanatorium, Nuwara Eliya, is fully dealt with in the same author's able and interesting work on the "Climates and Weather of India, Burma and Ceylon." But with the one sanatorium of Ceylon, *as yet* (for the lofty and extensive table-land known as Horton Plains, 7,000 feet above sea-level, richer in soil than Nuwara Eliya, must surely be opened up and settled as the railway traffic begins daily to pass its base)—with our *one* mountain health resort and the *thirteen* scattered over India, from south to north, I must deal in a subsequent communication.

INDIAN PLANTING NOTES.

DHUDHUR ALLI, March 2.—Rainfall this week 1·42; total to date 2·25. Thermometer highest 75, lowest 57. Rain has changed the appearance of the whole country about here, and there is a perceptible change in the climate warning us of the hot weather's approach. In the Garden. "Hoeing" and "Tipping" are about the only works going on.

CHARALI, March 3.—Weather seasonable. We have had several welcome showers of rain. Early pruned bushes almost ready for tipping. The D. M. R. were inspected at Tezpore on the 25th ultimo when all the Bishnauth Division turned up except one man. The station officials don't seem to take much interest in volunteering as everyone of them cleared out to the Mofussil.

NAGRAKATA, March 6.—We are having very seasonable weather and the expected rain fell in heavy showers on the 5th instant. Rainfall up to date 1·04 against 1·15 last year.

DARJEEING, March 7th.—Yesterday was a nasty cold day with ¾ inch in rain. Clearer today. With sun, leaf should commence to come on strong. Cold weather works finished on most gardens; and all manufacturing houses ready for the commencement of plucking.—*Indian Planters' Gazette.*

TEA EXHIBITS AT THE AGRI-HORTICULTURAL SHOW AT MADRAS.

We have been favoured by the Honorary Secretary of the Agri-Horticultural Gardens with a copy of the Calcutta Tea Broker's Report on the teas exhibited at this show.

WOODCOTE ESTATE.—Valuation 1s 3d per lb. Leafy and small broken Pekoe, fair tip, brisk, rather light, little flavory.

KODANAAD ESTATE, Kotagiri.—(2 exhibits) No. 1. Valuation 1s 2d per lb. Small close black Pekoe leaf, fair tip, rather brisk, light.

No. 2. Valuation 11d per lb. Dark Pekoe kind, rather broken, fair tip, fair strength, rather coarse, poor quality.

GLENDALE ESTATE, Coonoor —(2 exhibits) No. 1. Valuation 1s 6d per lb. Rathor bold, curly Pekoe leaf, fair trip, brisk, good flavor, light.

No. 2. Valuation 2s 2d to 2s 4d per lb. Small Pekoe leaf, good tip, little full brisk, good flavor.

TERRAMIA ESTATE, Coonoor.—1s 5d per lb. Curly dark Pekoe kind, rather broken, mixed with ends, little flavory, liquor wants pungency.

PARRY & CO., South Wynaad.—Valuation 10d per lb. Dark mixed Pekoe leaf, rather stalky, mixed with ends, thin, poor quality.

Glendale estate obtained the gold medal, and Woodcote estate the silver medal.—*Madras Times*, March 7.

THE DEMORALIZED QUININE MARKET IN AMERICA.

The action of one of the manufacturers in reducing the price on small packages of quinine to a figure very close to the quotation for bulk has completely unsettled the market without apparently causing the increase in the demand usually following closely upon such a radical change. There seems to be nothing in the position warranting such a decided departure from ordinary practices, and the explanation given in our market report last week, that the step was instigated by the recent publication of the views of a former manufacturer, accompanied by an offer to sell small packages at unusual low prices, appears in the absence of more definite reasons to have furnished the incentive for the move. Since the break was announced with as much publicity as the parties making the announcement could command, it has been met by most of the agents of the foreign makers and that fact has resulted in a further decline. The price first named on five ounce packages by the domestic manufacturer referred to was twenty-five cents not, but the subsequent competition impelled him to offer an extra inducement to jobbers by allowing them a discount of five per cent. One of the foreign brands is now offered at twenty-four cents, less one per cent for cash and it has been intimated that some sellers might accept even less. The fact that buyers have not responded with any degree of alacrity to the flattering propositions made by the sellers has robbed the situation of some of its importance. The apathy of the jobbers is probably due to their knowledge that retailers, under the existing condition can do almost if not quite as well as they and that they therefore have no inducement to buy more than they need to fill current orders.

The market for bulk goods in spite of circumstances that should contribute to a weak feeling is fairly steady. At the same time speculative interest is almost entirely withheld and were it not for the brisk consuming demand caused by the presence of the grip and malarial diseases in the South and West, the market would present a dull appearance. Many are disposed to believe that the present war of rates is only a temporary matter and that it will be followed by a very decided reaction during the spring if not sooner.—*New York Drug Reporter*, Feb. 4th.

D. MORRIS, M A., F.L.S.

(From the *Jamaica Gleaner*, with a portrait.)

Mr. D. Morris, so favourably known and esteemed in Jamaica, was another of the prominent personages who arrived yesterday in the packet from Barbados. Mr. Morris is on a special tour of the West Indies for the purpose of encouraging the agricultural industries in these islands and increasing the usefulness of the several botanical stations. He has visited most of our sister islands and has delivered addresses to large audiences in each, stirring up their interest in the industries peculiar to the island they live in. Here also no doubt we shall see and here a good deal of one at Jamaica's warmest friends. It may not be amiss to give a few brief details of the career of Mr. Morris. Mr. Morris is a native of Swansea, South Wales, and was educated at Cheltenham, and Royal School of Mines, London; was senior moderator and first gold Medallist, and took natural science honors at Trinity College, Dublin, receiving the degree of B. A., in 1876 and M. A., in 1880. He was appointed by the Earl of Carnarvon, assistant to Dr. G. H. K. Thwaites F. R. S., C. M. G. at the Royal Botanical Gardens, Ceylon, in 1877. He was next placed on special duty, in the Coffee Leaf Disease Inquiry, in that island in 1879 and publicly received the thanks of the "Planters' Association of Ceylon" for services in connection therewith, as also special commendation from Sir Michael Hicks-Beach, and an honorarium equal to one year's salary. Appointed Director of Public Gardens and Plantations in Jamaica in 1879. He was engaged on a special mission to Grenada and Trinidad to report on the cultivation of cacao in 1882 and in the same year he visited and reported on the economic resources of the colony of British Honduras. He was appointed Chairman of the Jamaica Committee of the Amsterdam Exhibition in 1883 and in the same year he visited and reported on the resources of the island of Helena at the request of Lord Derby, and was appointed a member of the Government Committee on Fibre Plants. In 1884 he prepared a report on "Planting Enterprise in the West Indies" which was presented to both Houses of Parliament and in the same year 1883 he was Chairman of the Institute of Jamaica. In the following year he went as Commissioner for Jamaica to the World's Exposition at New Orleans where he was instrumental in getting the quarantine restriction removed against Jamaica. He was appointed in 1886 Assistant Director of the Royal Gardens at Kew and left the island amid the regrets of all who knew him. He has since done good work at Kew and this year he has come out to the West Indies on the mission referred to. Mr. Morris is author of "The Colony of British Honduras" of "The Agricultural Resources of the island of St. Helena," "Cacao, how to grow and how to cure it," "The Mongoose on Sugar Estates in the West Indies," "The history and cultivation of Liberian Coffee" and numerous other works treating on the distribution and cultivation of economic plants in the West India Islands.

THE CONSUMPTION OF SUGAR.

Uncle Sam has a sweet tooth. It has been suspected for some time; now there are figures to show it. The latest statistics reveal the fact that the United States consumes more sugar than any other nation in the world. Year by year the human family has been developing its taste for sweet things, the consumption of sugar of various kinds having steadily grown faster than the race has multiplied. And year by year the States and territories making up this hustling "Yankee nation," have in their use of sugar been as steadily gaining on the average consumption *per capita*, until now our 62,500,000 are found to have beaten the record, not only in the total amount consumed as a country, but probably in the average per inhabitant as well. It seems that we used about 50 lb each, last year, or, to be more exact, near 3.100,000,000 lb in all. The rest of the world consumed nearly 10,000,000, lb. It will doubtless be news to a great many people in the United States to learn that of this vast quantity of sugar consumed by the different nations, over 60 per cent is made from beets. It is only a few years since beet sugar was first brought into the market, but from the time of its introduction the quantity of it used has steadily gained on that of cane sugar. In 1884 and 1885 the quantity of each was about equal; the season of 1885-6 placed beet sugar in the lead, and each year's work has given it a little advantage, until now the world consumes 7,700,000,000 lb of sugar made from beet, as against 5,011,000,000 lb of sugar made from cane. The relative quantity of the two kinds consumed in the United States at present is not in the same proportion; beet sugar being less than one-fifth of the whole amount. But there are strong indications of a

very rapid change in this respect. For instance, we import four-fifths of all the sugar we use; the amount of cane sugar imported last year was no larger than that of the year before, while the importation of beet sugar was nearly four times greater than it was the previous year. This was an exceptional increase, to be sure, but the growth has been steady for some years past; and when to these significant facts are added the successful commencement of beet sugar making and the tremendous interest now being taken in the possibilities of the industry, it will be seen that the probabilities are altogether in favor of both the production and consumption of beet sugar in this country soon exceeding that of sugar made from cane. The position of beet sugar among European products is thus stated in a pamphlet issued by the Oxnard Beet Sugar Co., of Grand Island, Neb.: "Beet sugar paid the the Prussian war debt in France, and has done more to make the people wealthy than any other thing. Last year Germany produced 1,220,000 tons of beet sugar—more than any other nation. Austria followed with 730,000 tons, France with 700,000 tons, Russia 480,000 tons Belgium with 195,000 tons, Holland 60,000 tons. Total production 3,445,000 against 2,761,457 tons in 1888, and 2,451,900 tons in 1887. This is the most successful agriculture in Europe. It will soon make the farmers of Nebraska who raise sugar beets rich and stimulate all other interests."

[The above is from the "Sugar Bowl," published in New Orleans. In the same paper occurs the following paragraph on the very exceptional riches in saccharine matter of sugar cane grown in Louisiana:—

AS A SUGAR COUNTRY.—*Louisiana Equals the Tropics.* —Judge O. B. Sansum, a native of the West India island of Bermuda, we believe, where he was reared as a sugar planter, is enthusiastic over the future of sugar in Louisiana. He says last season we grew richer cane than he ever heard of in that country, and he thinks we can compete with the world in sugar production. To prove this, he shows an analysis of cane which he grew on the pine lands of Tangipahoa, which polarized 16·1 per cent in sugar! Not only the pine lands, but also many other sections last year made cane nearly as rich in sucrose.
—ED. *T. A.*]

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Feb. 26th.

CINCHONA.—Tuesday's bark sales offered a fairly extensive supply, distributed as follows:—

	Packages		Packages	
Ceylon bark	956	of which	665	were sold
East Indian bark ..	1,526	do	1,203	do
Java bark	66	do	40	do
South American bark	183	do	56	do
Total	2,731	do	1,954	do

The assortment was a poor one, and the auctions were altogether lacking in spirit, large piles being bought in at nominal prices because the limits fixed for them could not be obtained. On the whole the market was decidedly easier, and the unit price can scarcely be said to have averaged 1¼d per lb.

The following are the quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick work	164,370
Agents for the Mannheim and Amsterdam works	119,284
Agents for the Auerbach works	41,782
Messrs. Howards & Sons	38,838
Agents for the French, Italian, &c., works	35,075
Agents for the Frankfort o/M. and Stuttgart works	29,008
Sundry druggists	37,018
Total quantity sold ...	466,375
Bought in or withdrawn	158,943
Total quantity offered ...	625,318

QUININE.—Business has been very quiet this week, and the market closes weak and lower. A few days ago 5,000 oz. second-hand German bulk were reported sold at 10½d per oz., and today there are further sellers at that price, but no one ventures to buy.

LONDON, March 12th.

ANNATTO.—Bright Ceylon seed is repored to have been sold privately to some extent at the rate of 2½d per lb.

CINCHONA.—The supply of bark offered at Tuesday's auctions was exceedingly small. The catalogues comprised:—

	Packages		Packages	
Ceylon bark ...	575	of which	561	were sold
East Indian bark ...	587	do	476	do
Java Bark ...	3	do	—	do
South American bark	360	do	248	do
Total ...	1,525	do	1,285	do

The assortment was a poor one, and does not call for any special observation. A quiet tone prevailed, and there was no quotable change in the prices. The unit remains at about 1¼d per lb. Fine bright Succirubra chips and shavings for druggists are scarce and realise comparatively high prices, with good competition.

The following are the quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick works ...	36,080
„ Mannheim and Amsterdam works	145,117
„ Frankfort o/M and Stuttgart works	24,468
„ American and Italian works ...	22,042
„ Auerbach works ...	20,266
Messrs. Howard & Sons	18,090
Mr. Thomas Whiffen	1,780
Sundry druggists	19,690
Total quantity sold	288,033
Bought in or withdrawn	52,829
Total quantity offered	340,862

JAVA CINCHONA.—Three cases good druggists' stem quills were bought in at 1s per lb.

SOUTH AMERICAN CINCHONA.—Of 246 packages cultivated Bolivian Calisaya, 215 packages were sold (27,180 lb.) at 7¾d per lb. for fair broken quill; 5d to 5½d for quilly chips, and 1½d per lb. for very common twigs. Twenty-nine bales damaged Pitayo, and 4 bales ditto soft Colombian, via Hamburg, sold at 2d per lb. A parcel of 75 bales damaged Carthagena, also via Hamburg, is held for 6d per lb. The next Amsterdam sale will take place on April 2nd. The shipments from Java continue large, the steamer "Sumatra" which left Batavia on January 29th, carried about 75 tons of bark. The exports of cinchona from Java are given as follows by Messrs. Böhirnger & Sons:—From July 1st, 1890 to February 27th, 1891, about 2,400,000 kilos.; from July 1st, 1889 to March 1st, 1890, 1,758,000 kilos. On the other hand the arrivals by rail in Colombo show a considerable decline, the figures being: January 1st to February 23rd, 1889, 575 tons; same period 1890, 415 tons; January 1st to March 1st, 1891, 260 tons:

The arrivals from Southern India this week have been very heavy, the S. S. "Stentor," which arrived on March 5th, alone brought 1,729 packages from Calicut and 480 from Beypore.

ESSENTIAL OILS.—Citronella without business, at ⅝d to ¾d per oz. Lemon grass also quiet at 1½d to 1¾d per oz.

IMPORTATION OF UNSOUND TEA.

The Collector of Customs having been requested by the Colonial Treasurer to report on the statements of a deputation to the effect that unsound tea condemned in Melbourne was being imported into Sydney, forwarded to the Government Analyst six samples of the questionable tea, and asked for a report, the three points to be determined being—(1) Whether the tea was of the following standard—30 per cent. of extract, 3 per cent. of soluble ash, calculated on the dry tea 212 degrees Fahrenheit, or more than 8 per cent. of total ash. (2) Whether the tea represented by the samples contained any ingredient injurious to the health of possible consumers. And (3) Whether the tea was unfit for human consumption. To these questions the Government Analyst replied as follows: Government Laboratory, Sydney, 25th February, 1891,—Sir,—I have the honour to submit the result of my analyses of the samples of tea, which are

found to be as follows :—

Percentage of Mineral Ash.	Percentage of Extract.	Percentage of Soluble Ash.	Percentage of Theine.	Percentage of Insoluble Ash.
6·20	27·88	3·03	0 69	68·50
6·23	28·20	3·28	1·37	67·95
6·56	30·10	3·62	1·55	64·28
6·07	29·80	3·26	1·40	65·54
6·18	28·76	3·47	0·81	67·16
5·87	27·30	3·07	0·68	69·05

In reply to the request contained in your letter the above results will, I think, answer your first question as regards quality. The sample third on the list passes the standard for genuine teas. To the second question,—viz., as to whether the tea represented by these samples contains any ingredient injurious to the health of possible consumers,—I am able to answer in the negative. With reference to the third and final question,—as to whether these teas are fit or unfit for human consumption,—I am of opinion that they are fit for human consumption, one of them passing the standard adopted by different Governments and institutions. In the Public Health Bill now awaiting the attention of the Legislature definite standards are provided under which five out of the six teas would have been condemned as unfit for human consumption. The fact, however, remains that all the samples are of very inferior quality. I am, &c. William M. Hamlett, F.I.A., F.C.S., Government Analyst." On this report the Colonial Treasurer has expressed the opinion that in the present state of the law it is not possible to prohibit the importation of the tea in question, which, with the exception of one sample, is found to be of lower quality than the standard adopted by any other colony. He, however, regards the report of the Government Analyst as satisfactory evidence that the tea does not contain any ingredient injurious to the health of possible consumors, and that it cannot be considered unfit for consumption. The adoption of a standard regulating the quality of imported tea will be considered when the proposed Public Health Bill is introduced.—*Sydney Mail.*

TEA PLANTING IN UVA.

The Haputale and Madulsima Companies, on the principle of "Hobson's Choice" we fancy, are following the many examples set them by estates originally opened for the cultivation of coffee and cinchona and are now going largely in for tea. Mr. George A. Dick and Mr. Arthur Scovell (two good men and true—most experienced and reliable planters) have recently joined the Ceylon Board of management, a fact which argued well for the future success of the two Companies in question. "It is a long lane that has no turning" and we heartily and trustfully anticipate a good time coming for both the Haputale and Madulsima, as for other Uva Planting Companies.

LARGE PURCHASES OF ESTATE PROPERTY.

The Ceylon and Oriental Investment Corporation, Limited, have just acquired the group of lowcountry estates comprising about 1,500 acres,—about one-third in tea—belonging to Mr. Jeronis Pieris. There are five estates (Wilton, Moralioya, Pathragalla, Narthupana and Deegalla) situated in the Awisawella and Kalutara districts, all of them more or less planted up with tea. The negotiations were finally closed yesterday afternoon by Mr. J. Huntley Thring, and Mr. E. G. Harding on behalf of the Company, and Mr. W. H. Davies on behalf of the seller. Mr. Thring, the Managing Director of the Corporation, returns to England per S. S. "Kaiser-i-Hind," after a successful business trip through the planting districts.

TRINIDAD SUGAR PLANTERS AND THE McKINLEY BILL.

Last month a majority of the Trinidad sugar planters called on the American consul, Hon. Wm. Pierce, and read an address correcting the impression that their immigration tax is an "export duty in disguise," depriving them of the benefits of free entry of their sugar in the United States. Their address is interesting. It cites that when, 45 years ago, slavery was abolished there, the sugar industry would have been extinguished but for the act permitting introduction of East Indian immigrants, on a ten year contract—five years' indenture to the planters who employ them, at an indenture fee of £5 per head and an immigration tax on their produce; the second five years they being free to hire where they please. They stated :—As a result, there are now 70,000 East Indians in Trinidad, in a total population of 200,000, and, as a further result, the exports of the colony have increased in a most remarkable and satisfactory manner.

Mr. Pierce promised to lay their views before our Government. During the interview he spoke of our recent legislation as follows :—The sugar producers of the United States had expended more or less money in the way of sugar estate improvements, upon the idea that the sugar industry was being protected by a heavy import duty. For the Government to have thus encouraged them to make those improvements and then to greatly diminish the value of the same by taking off the custom house duty on imported sugar, would be unjust, if some way had not been found to compensate them for their loss, and their bounty, which is only to last till 1905, was doubtless intended as such compensation.—*Farm Journal.*

THE INDISCRIMINATE PLANTING OF TREES IN OOTACAMUND.

[The conclusion of the discussion on alleged excessive tree planting in Ootacamund contains the commonsense of the matter. It is evidently a minute by the chief Government officer of the district, in his capacity of Chairman of the Municipality.—ED. *T. A.*]

Notes on the influence exercised by trees on climate by Dr. Balfour, printed at page 410. Madras Journal 1849-50. In this reference is made to the fact that the climate of Canara became drier, the seasons more uncertain and the land less fertile, since the tract was denuded of forest and Dr. Balfour adds "I have also understood that effects of a similar kind have been experienced at the Nilgiri Hills." The whole of the notes is very interesting and a summary of the beneficial results of trees are given at page 445. The notes were highly commended by Minutes of Consolation dated 8th September 1848. No. 981 *The atmosphere by Flammariar page* 280 and 281. There the advantage of trees in point of temperature is fully explained. There are other books and papers in which the planting of trees is highly commended, and there is not a word in them pointing to any disadvantage in a place like Ootacamund. Ootacamund is located in an extensive valley which permits of the free course of the winds and which is sufficiently inclined to allow of good natural drainage from every part of it," page 48 of the District Manual.

"The climate * * * for the greater portion of the year is decidedly salubrious. The air is pure and bracing, and has a sensible affect in exhilarating the spirits and increasing the disposition to exercise." Same book-page 48.

The area of the Municipal town is nearly 12 square miles. The excessive planting complained of is not apparent to any one who looks around. On the other hand, the portions on the East and West seem to be markedly bare. The direction of the winds is chiefly from the West and North (page 49 of the Manual.)

The existing plantations have been formed first for shelter and in later years for profit; but they are by no

means excessive, regarded either in point of sanitation or local requirements. The complaint has been as reported by Dr. Balfour, that Ooty has become drier than it was 15 or 20 years ago and this change is attributed to deforestation. As to the 2nd conclusion of the Sub-Committee vide para (8), it appears clear that the Municipal Council can take action under the present sections of the Act in regards to Acacia Wattle, and undergrowth *containing decayed vegetation and noxious matter.* Otherwise, no interference can be exercised, nor is it necessary or expedient to ask for power to do so, as however unsightly such growth may be it is a source of profit and living to several people in the town. The poor people use it for fuel and Wattle has a commercial value as tanning material, although no one has availed himself of the advantage: As to conclusion 3, (vide para 8), the Sub-Committee has not proved by statistics the evil said to have resulted from trees and undergrowth and what evils are feared in the future. The law reports to which I carefully referred make this particularly clear. You cannot restrict the number of trees growing in existing plantations without fully compensating the owners, nor can you restrict future planting in private land without very seriously interfering with private rights. This must be demonstrated before Government can be induced to legislate in the direction pointed out. The Sub-Committee's proposals involves a serious interference with private rights and vested interests, calculated to depreciate the property very considerably. It is a maxim of law that "A legislative enactment ought to be prospective, not retrospective, in its operation." "The laws are adapted to those cases which most frequently occur." There is no wrong without a remedy." "In law the immediate, not the remote, cause of any event is regarded." "Enjoy your own property in such a manner as not to injure that of another person." If Government takes into consideration the amendment of the law as recommended, the restriction in regard to past plantations can only be enforced on payment of compensation to the owners concerned as explained by the above maxim the analogy of section 168 (3) of the present Municipal Act.

I would recommend the Council to pass a resolution in general terms to the effect that after fully considering the vegetation existing within Municipal limits it considers that existing plantations cannot be interfered with without interfering with private rights to an unwarrantable extent as it is not prepared to compensate owners for the value of all trees to be cut out of existing plantations.

II. That as regard Wattle, it will endeavour to effectually deal with this pest by the continuous issue of notices to clear.

III. That it appoints a standing Sub-Committee to watch vegetation and to report instances of noxious vegetation for want of notices to clear. The members of the Sub-Committee in fact to divide the inspection of the town among them. I don't think this is asking too much, as with one or two exceptions the Commissioners don't do very much inspection. That as regards future plantations, the Government be requested to obtain the opinion of the Advocate General as to the competence of the Council to pass and of the Government to sanction, the passing of a bye-law prohibiting the planting of any tree except purely ornamental trees without the sanction of the Council previously obtained. The question bristles with legal difficulties and is eminently one for the Advocate General to advise.

It has just occurred to me that the Council might very fairly ask the Government to help in reducing the timber area within Municipal limits by closing their depot. Purchasers would thus be driven to private producers of firewood and private plantations would be reduced in area.—*S. I. Observer.*

MIDDLING PLANTATION COFFEE is quoted by Reuter at 109s 6d per cwt., but sales have been effected by Colombo firms within the past few weeks at as high a figure as 115s per cwt. delivered cost and freight at Trieste, while it has exchanged hands locally at R72 per cwt.

CEYLON COCOA.

By Dr. A. J. H. Crespi.

One of the most curious features of modern commercial activity is that Nature is, as it were, compelled to improve on her own earlier efforts. Supposing that some much-prized plant is found to do well in a particular region with a climate of given warmth and under certain recognised conditions: the next thing is to find out a region where those conditions are still better, and to introduce the plant there. This seems to have been done with the cacao tree in Ceylon, and cocoa superlative excellence has for many years been manufactured from cacao beans imported from that beautiful island. Some brands of Ceylon cocoa have been recently commanding very high prices; this shows what a magnificent field exists in Ceylon for cocoa culture, and that the quality of the cocoa from that island is far above the average of West Indian varieties. The principal peculiarity of the Ceylon brand is its delicate flavour and rich aroma; although when prepared for use its price is not very high, and quite within reach of most incomes. We confidently predict that as it becomes more generally known, it will be sold in still larger quantities, and so open up a fresh and most important branch of trade to British enterprise.

Messrs. J. S. Fry and Sons, the well-known makers, whose house was founded in 1728, were not slow to recognise the peculiarly delicious flavour of Ceylon cocoa, and they have accordingly added another luxury to our household beverages in the form of Ceylon chocolate, a speciality that is being much appreciated by connoisseurs. While on the subject of Ceylon cocoa, we have just been favoured with some of the most recent statistics relating to the consumption of cocoa in England. Although a great authority gives the average consumption as five ounces per head, it is now ascertained to amount to eight, or to be more precise, in 1889 it reached 18,464,164 pounds. This is not a large total after all, but marks progress. In 1820, duty was only paid on 267,000 pounds; in 1875, on 9,900,000 pounds. In other words, the consumption has doubled in fourteen years, and should the present rate of progress continue another fourteen or fifteen years, the trade will reach, for the first time, very respectable dimensions.

Considering its fragrance and nutritive properties (for all preparations of cocoa are a true food, and valuable as tissue restorers and force producers), perhaps the small consumption is surprising. For our part we prefer well-prepared cocoa to all other beverages, while indigestion, which is so frequently caused, or at any rate, aggravated by the too liberal use of hot tea, does not follow cocoa. The cocoa trade is in a healthy and active state, and the wants of the general public are not likely to be neglected as long as so many leading English firms busily engaged ministering to the national needs.

One of the best uses to which Ceylon chocolate can be put is to eat it when on tricycling or pedestrian excursions. We have it most convenient, and we believe that cyclists, who are often at a great loss for a portable and palatable food which they can eat without dismounting, will more and more trust to chocolate as their sheet-anchor. Long before our attention had been directed to the subject by a circular we were reading the other day, we had found out the value of dry and satisfying food when many miles from home and pressed for time. —*Hardwicke's Science Gossip.*

ECHOES OF SCIENCE.

According to a paper read by Professor Maisch at the Philadelphia College of Pharmacy, the camphor tree is being cultivated on an extensive scale in Florida. It grows rapidly there, and seems to flourish in any kind of soil. Professor Maisch estimates that in ten years there will be more camphor than orange groves in that State. The quality of the gum obtained is more like that of Japan than China, the odour of safrol being quite sensible.

An American contemporary records the blood-poisoning of several greenhouse workmen through contact with a plant known as the Chinese primrose (*Primula obconica*). It is a native of Central China, and was first cultivated from the seed in England about ten years ago, when it created some stir owing to the beauty of his winter blossom. It has, however, the property of irritating and even of poisoning the skin of some people who touch it, producing an inflammation resembling eczema. The sting of the leaves will sometimes last for several days.

Quite recently Mr. W. H. Weed, of the United States Geological Survey, has proved that plants of a low grade are important agents in the production of travertine, tufas, and sinters, hitherto believed to be the effect of inorganic chemistry. The abundance of algæ in hot springs has often been observed, but passed over as a curiosity of biological science, in spite of the well-known fact that certain water-plants extract carbonate of lime from its solution. Some years ago the present writer drew attention to the fact that most of the "coral sand" on a certain West Indian Island is really the calcareous skeleton of a sea-weed, and not, as was imagined, the *débris* of rock coral. Cohn, a German naturalist, has shown that vegetation is an agent in the production of travertine in the Carlsbad springs.—*Globe.*

TEA: FINE PLUCKING AND HIGH AVERAGES.

(*From a correspondent.*)

I think there can be little doubt Alnwick and Portswood pluck fine, though they do not admit it. The samples at the Exhibition in Nuwara Eliya looked so. If according to Wilson, Smithett & Co's, account, Portswood only made 20,000 to 30,000* lb. last year there is no wonder the average was high. You will find wherever they make quantity the average will go down, or I am very much mistaken. Generally speaking, it will never pay to make fine teas unless you could make a large quantity and that would be impossible.

NUWARA ELIYA EXHIBITION AND TEA PRIZES.

A planting correspondent writes:—

"In giving the prizes at Nuwara Eliya for Ceylon teas of breaks to be sold,—that is, the samples *were supposed to be* of breaks to be sold,—"Alnwick" received the gold medal, and Portswood the silver medal, the teas from the latter having averaged 1s 4d all round for 1890, the estate never having EVEN BEEN ONCE *below the first average* out of all the monthly sales during the year. Alnwick for the same period was at 1s 1½d—see Wilson & Smithett's Circular (Ceylon Tea Memoranda for 1890) published in March 1891:—

"Alnwick 56,000 lb. average 1s 1½d.

Portswood 45,000 lb. (sold some locally) 1s 4d.'

The Portswood teas sent to the Show, I believe, were drawn from the bulked tea by Mr. William Mitchell junr. in the Portswood tea factory."

* No—the return for Portswood is 45,000 lb., and extent in tea being 240 acres, but all will not be in full bearing. Alnwick is down for 56,000 lb. at an average of 1s 1½d last year, the *Directory* showing 235 acres in tea.—ED. *T. A.*

PORTSWOOD TEA AND LOCAL SALES.

The rates at which the Portswood teas were actually sold after last sale—R1, 72 and 62 cents—are so good and (as the Brokers tell us) so fully covered the reserve rates, that we think the proprietor is scarcely justified in grumbling about local sales. No doubt Mr. Grinlinton has got higher rates at home; but has he made full allowance for the different state of the market at different dates? So far from casting reflection on "local sales," we think the splendid prices realized here for Portswood teas last week, is about the strongest encouragement to sell teas locally that we have yet seen. As a matter of fact, the sale in London in February took place at a particularly good time, while a sale here at the end of March with the prospect of what the market may be towards May is a rather different matter. At any rate, we can only say: "Well done the Colombo market and the Colombo Brokers that got such splendid prices for Portswood teas last week."

CEYLON TEA.—The *Times* reports that a consignment of Tea from Ceylon, recently sold at Mincing Lane, was, in the opinion of experts, the finest Tea ever grown. It was ultimately sold for no less a sum than 87*s.* a pound; and again changed hands at £5 10*s.*—a price never before approached in the Tea trade. Bravo, Ceylon! Honour to the memory of the botanists in India, whose labours and discoveries more than half a century ago rendered such things possible.—*Gardeners' Chronicle.*

"KEW BULLETIN."—The January number comprises articles on the West African Bass Fibre, the produce of a Palm, Raphia vinifera. Chinese ginger, the preserved ginger of commerce, is, it appears, not a ginger at all, but the produce of Alpinia galanga, which is said never to flower in China but which has been obliging enough to do so at the Hong Kong Botanic Garden, as well as at Dominica. The remainder of the numbr is taken up with correspondence relating to the production of seed in the sugar-cane, and the consequent possibilities of new varieties being originated.—*Gardeners' Chronicle.*

CLOSE PLANTING OF VINES.—That the practice of planting the Vine much closer together than 3½ to 4 feet is not always a failure, is shown in a photograph of a vinery with Vines in bearing (not suitable for reproduction), sent us by Mr. Richardson, gradener, Wood House, Stansted, Essex. The house is 50 feet long, and contains twenty-one canes of Black Alicante and Lady Downe's Seedling, planted at 2 feet apart. The crop seems, from the view taken in October, to have been a heavy one. In the long run we think that close planting would end in inferior crops for very obvious reasons. The weakening of the Vines would commence and go on with the exhaustion of the border, the yearly lessening size of the foliage, and the size of the annual wood.—*Gardeners' Chronicle.*

MORE ABOUT THE GARTMORE TEA.—The following is from the *Sunday Times* published in London:—

"Tea at £10 12s. 6d, a Pound!—A small lot of Ceylon tea from the Gartmore estate realised this ridiculously inflated price at a public auction at the Mincing Lane sale rooms. The tea is said to possess extraordinary qualities in liquor, and to be composed almost entirely of small 'golden tips,' which are the extreme ends of the small succulent shoots of the plant, and the preparation of such tea is of course most costly. I should like to know something more about the 'extraordinary qualities' of this two hundred-and-twelve shillings-and-sixpence a pound tea when it is in liquor.' Does it waken snakes? Will it make goats dance? Will it make to see comets, or feel like the Grand Turk? Well, the worth of anything is just as much as it will bring. It is a pity, nevertheless, that Sardanapalus and Cleopatra are deceased. They would perhaps have liked to invest in a small lot of 'golden tips' at £10 12s. 6d. per pound fortheir five o'clock teas."

CEYLON TEA IN 1890.

MESSRS. WILSON, SMITHETT & CO.'S REVIEW.

We give on page 766 the full text of this extremely valuable series of notes and statistics on the course of London sales of Ceylon Teas for last year, together with general statistics as to total imports, consumption and stocks of all teas in the United Kingdom. While Portswood estate heads the list with the highest average price of any Ceylon estates teas, K. A. W. has the honour of sending the largest quantity (568,000 lb.) from any Ceylon factory with the good average of 10½d. The leading position in price as regards districts of Bogawantalawa and the Nuwara Eliya neighbourhood, reminds us of the remark credited to Mr. Arthur Thompson that our highest-grown teas when shipped in sufficient quantity to keep up a regular supply, might well be marked "Ceylon-Darjeelings" to attract the special attention of buyers of fine teas. Has any shipper done this with high-grown teas and with what result, we should like to know. Kintyre green teas are referred to with commendation, and it is gratifying to see that both Russia and America are expected to be good customers of Ceylon teas in 1891. What is said about the size of bushes again merits careful attention. Dimbula of all districts sent the largest quantity of tea—5,700,000 lb.—at an average of 11¾d in 1890. It is very remarkable to note how the consumption of China teas in the United Kingdom had fallen from 106,310,000 lb. in 1885 to 57,500,000 lb. last year; while that of India and Ceylon had risen from 68,890,000 lb. to 136,500,000 lb. in the same period.

From Messrs. Geo. White & Co.'s Annual India, Ceylon and Java Tea Report, date 20th March, 1891, received today, we quote as follows:—

CEYLON.—When writing last year, we were able to chronicle a marked expansion in the Ceylon trade. Further decided progress has since then being made, the result being an increase in both imports and deliveries of about seven million lb. for the eight months ending 28th February last, the consumption having no doubt been stimulated to some extent by the reduction in duty. This is satisfactory, as it proves the steady and increasing demand existing for these growths, which also no doubt prevented the fluctuation in value seen in former years—the lowest monthly average during 1890 being 10d and the highest 11½d, whereas, in 1889, the range was from 9d to 1s 1¾d; tho 545,000 packages sold during 1890, and 438,000 packages in 1889, having however, realised about the same price, viz., rather under 11d per lb. After Christmas, demand further improved in consequence of the statistical position, which was strengthened by the loss of the S. S. "Nepaul" and "Hong Kong;" but later on, owing to heavier arrivals and quiet country trade, there was less disposition to purchase. On the whole, quality has been desirable, there being a much smaller proportion of over-fired and sour Teas, though few ever really choice flavoured parcels, perhaps due to rather coarser plucking on some of the gardens. During the season, several little lots of "Golden Tips" have been sold, one at 30s. 6d., another at 87s., both of which were re-sold at large profits; and a third was knocked down at £10. 12s. 6d. per lb., after some very spirited bidding between two of the largest advertising firms.

FINE TEA.

There is both profit and satisfaction in handling fine tea. It makes trade. Customers, as soon as their attention is directed to the matter, will discover that there are pronounced differences in flavour and come to appreciate the delicate fragrance of a fine leaf, instead of, as now, being satisfied with any sort of an infusion so long as it is warm. It is not likely that a grocer will sell fine tea unless he is himself a lover of the beverage and can discriminate as to body and flavor, and last of all style. People will soon learn that a high-priced tea is very little more expensive than a cheap tea. The Ceylon factors impress upon their customers that their "money can go as far in $1 25 tea as in a 50-cent tea; that is good tea can be cheap." Then, consumers need to learn the art of making tea and acquire the habit of steeping it at the table.—*American Grocer.*

THE MICA INDUSTRY.

With the extraordinary growth of the electrica industry in the United States for a number of years past there has been created a new and steady demand for mica, which, curiously, has failed to stimulate the mica mining industry in this country; the most important mines, indeed, show a decided decrease in producing during this time, and the business is now in a depressed condition. In the construction of dynamos, electric motors and some other electrical appliances, mica is a very important element, valued on account of its flexibility and excellent insulating qualities. For this purpose, however, there is a decided preference for foreign mica, the Canadian "amber mica" being generally used.

Mica is employed in dynamos and electric motors, mainly in building up the armatures, strips of various dimensions, but unusually about one inch wide, and from four to eight inches long, being used.

The foreign mica is considered preferable to that of North Carolina for this purpose in that while the latter can be split into thin sheets, it is by no means so tough, which is an important requisite. Such mica may perhaps be found in the United States, but up to the present time there is no doubt that some imported micas have proved more suitable for this purpose than the usual domestic grades.

Hitherto the most important, in fact, almost the only important use for mica has been in stoves, and the demands, and consequently prices of the article for this purpose have been such that mica mining was carried on at considerable profit.

The chief mines in the country are in New Hampshire and North Carolina, but principally in the latter State, these producing an excellent quality of the mineral. Several years ago changes were made in the patterns of stoves whereby smaller and correspondingly less expensive sheets of mica were used, and the lower prices resulting depressed the industry greatly, especially in North Calidonia, where many mines were closed. The total value of the product in the United States decreased from 368,525 dols. in 1884, to 70,000 dols. in 1880. During the same time the imports of mica, which, prior to 1884, had been of but trifling importance, increased from 28,284 dols. to 57,541 dols. —*Engineering and Mining Journal.*

SILVER.—I note that the Mount Zeehan Tasmanian Silver and Lead Mining Company has received a letter stating that lodes have been now found of 8 feet and more, and, as some 3 feet was before about the limit, it is clear that the value of this mine is infinitely greater than many supposed. I am of opinion that Mount Zeehan will be but one of the many coming examples of the enormous mining wealth latent in Tasmania.—"*Anglo-Australian*" in *E. Mail.*

TALKING OF TEA reminds me that Her Majesty always has her tea from a quaint, old-fashioned shop in Pall Mall. It costs, I believe, five and fourpence a pound, and is called "Earl Grey's mixture," from having been recommended to the Queen by that nobleman. It is said that Her Majesty's five predecessors have patronised the same tea. It says a great deal for this mixture that amidst so much degeneration in the tea that there is now, it should have held its own so long.—*Cor., A. F. Press.*

WILSON, SMITHETT & Co.'s CEYLON TEA MEMORANDA FOR 1890.

London, March 1891.

The amount of Ceylon Tea brought to auction in London between January 1st and December 31st, 1890, was about 30 per cent in excess ot the supply in 1889, and, it is satisfactory to note, realised the same average price as was recorded for that year, viz., 10¾d per lb., and only ½d per lb. less than in 1888, when the Imports were less than half those of the year under review.

The event of the year has undoubtedly been the reduction of the Tea Duty from 6d to 4d per lb. When in the early spring rumours were afloat as to the intention of the Chancellor of the Exchequer to partly utilise his surplus in thus relieving taxation the idea that Tea would be one of the articles touched was not generally creditod; it was argued that if once reduced the old duty could never be re-imposed unless under most pressing circumstances, and that the reduction itself would give no relief to the poorest class of consumers who buy their tea in penny worths. The eventual decision of Mr. Goschen has, however, been gratefully acknowledged by a large section of tea-drinkers, and so far as Indian and Ceylon producers are concerned the boon was conferred at a most opportune time. The rise in silver, precluding any invasion of the market by low-class China leaf, the impetus given to the home consumption shown by the increase of 8,400,000lbs. in 1890 over that of the two previous years, operated entirely to the benefit of British-grown teas. The silver question itself threatened at one time to be of grave import to the industry, but the crisis once past it may reasonably be questioned whether the danger was not after all a blessing in disguise.

In taking a retrospect of the course of the market during 1890 we are chiefly struck with the comparatively uniform range of prices ruling throughout the twelve months; the average never sank to the low level it touched in the spring of 1889, whilst it failed to reach the high average attained in the autumn of that year. The fears of the trade as to any prospective over-supply were effeotually allayed by the rise in silver, whereby the exports from China were considerably curtailed; and on the other hand, in the autumn, when the strong statistical position of the trade as a whole might have led us to expect a more important advance in values, a check was imposed by the wave of commercial depression caused by financial troubles, which at one time threatened to overwhelm the credit of the country.

Early in the year we enjoyed a very firm market for the lowest grades for price, but the better qualities soon commenced to recede in value, and the average price of 11¾d for the first week in January was reduced to 11d at the end of the month. In February a generally dull tone supervened, and operations were conducted in a very hand-to-mouth manner. At the earliest sales in March the market became very flat, and the quality of the offerings at this period was not calculated to counteract the downward tendency; the average price gradually declined, and one week was as low as 9¾d per lb. This low range attracted attention for a while, and some slight improvement took place; good Broken Pekoes and Pekoes, which showed the greatest depression, were more enquired for, and sold at enhanced values. A temporary flatness soon followed; in view of the possible reduction in the duty country buyers deemed it expedient to clear as little as possible, and dealers consequently also refrained from going into stock to an extent. After Easter, as the time for the disclosuro of the Budget proposals approached, the chief buyers began to take advantage of the heavier sales to extend their operations in view of heavy clearing orders in the near future; finest qualities rose slightly in value, but the lowest grades were chiefly affected, medium qualities, for the time, being disregarded, and the average price for several weeks fluctuated from 10¼d to 10½d per lb. The reduction of the duty, in due course, was accepted very quietly, but if it did not cause any marked advance in prices, it was no doubt an important factor in preventing any decline at this usually depressed period. Throughout June and July a steady tone prevailed, the best teas were well supported, and indeed the fluctuations were principally effected by the quality of the offerings. On the 1st July the first New Season's Chinas were offered, and, with the exception of several of the finest lines which commanded very full rates for export, sold at a low range. In August, the generally poor quality of Indian and China directed more attention to Ceylon—more especially to the fine teas. In September the improvement became more accentuated, and the average price gradually rose to 1s ½d—the highest rate recorded in the year. In October the low rates ruling for ordinary Indian Pekoes unfavourably affected the corresponding grade of Ceylon leaf; but a good all-round demand prevailed, the finest invoices being strongly competed for. After the first week in November the market began to show signs of weakness and irregularity, particularly for the more undesirable sorts; common Souchongs declined ½d per lb., and the weekly average gradually receded, and at the closing sale of December stood at 11d per lb.

The issue of our Annual Circular has again been unavoidably delayed by the heavy amount of work entailed in summarising the results obtained by most of the chief estates in Ceylon, numbering over 450. It is quite possible, that, for reasons advanced on previous occasions, some slight miscalculation may be discovered; we can, however, confidently recommend our statistics as substantially correct for all intents and purposes, and, we trust, that all those whom our circular reaches will prove it so for themselves, and regard it as of some practical interest and value. We can only once more congratulate Planters and all concerned on the highly satisfactory state of the industry, and confide our researches to their favourable consideration and study. It will be remembered that whereas last year only five names appeared in the first group of estates aggregating over 200,000 lbs. seventeen are to be found this year, two of which, Mariawatte and the Kadawella group, have contributed over half-a-million lb. each. The fine teas of the New Dimbula Co., with a yield of 209,000 lbs., head the list with an average of 1s 1½d against 1s 1d per lb. last year closely followed by Wallaha with an output of more than double that quantity. In several other cases last year's average has not been maintained, but in many instances this is to be traced to rather freer plucking, and we doubt whether many more satisfactory results can be quoted than the average of 1s 0¼d per lb. for Chapelton with a yield of 450 lbs. an acre. In the second group Labukelle has given 15,000 lb. less tea, but has more than compensated by an increase of 2¼d per lb. in the average price realised; the fine delicate flavoury teas of this garden have sold largely for Russian account throughout the year. The next estate in the list—Kotiyagalla—whose Pekoes also have again found marked favour in the same market, has with an increased yield of 16,000 lbs., averaged 2¾d per lb. more than in 1889. Kirkoswald sending 43,000 lb. more has maintained the same average. Gleudevon with an increase of 20,000 lb., is only a ¼d per lb. behind, and Invery at a like small expense has increased its yield by about 70 per cent. In the third group Mooloya with a stationary yield has advanced 1d per lb.

The Highest average of all is that of Portswood viz :— 1s 4d, against 1s 4½d per lb. last year; perhaps no estate has so well maintained its distinctive character as this well-known mark.

Bogawantalawa and the country round about Nuwera-Eliya head the Districts with an average of 1s 0¼d, or 1½d above the average realised by the Ceylon Tea sold on the London Market; but the case of Dimbula will perhaps be considered the most satisfactory; the yield from this fine district we estimated last year at 3,800,000 lb., this year we put it at 5,700,000 lbs., with the same average, viz., 11¾d. Amongst the

remaining districts the most noticeable is a rise of ¾d per lb. in the productive Kelani Valley.

During the past year the demand for Ceylon Tea on the Continent has developed considerably; a comparatively large business was done, principally with Russia, and we confidently look forward to a still greater distribution in this direction in the coming season. Several large lines of good useful Pekoe Souchongs have sold in the United States and in Canada, and we may also reasonably look forward to extended competition from this quarter in the future. The Ceylon Tea Co. in New York, founded at the close of last year, will doubtless prove a valuable medium for prosecuting this desirable enterprise.

Early in the spring of 1890 some especially fine Green Teas from Kintyre estate, attracted much attention and commanded very high prices; they did not, however, find a ready market in the country, and subsequent consignments were disposed of at much lower but still at satisfactory rates. The demand for this class of tea is restricted to a very small area at home and prices obtainable in America are not such as to encourage their manufacture on any large scale. The example of the above estate was followed by several others, but the quality of the teas was of a very inferior kind. Several small consignments designated Oolongs met with very languid competition, being dry and malty and totally lacking the distinctive character of the Formosa type.

The size of the breaks from many estates was much more satisfactory last year, and it is to be hoped their example will be more universally followed in the coming season. Much irregularity in prices will be saved if care is taken in this respect specially in the large proportion of medium qualities. In times of heavy supply the large lines will always secure the most attention, except in cases of tea of particularly fine quality, when their marked superiority naturally compels competition. The surprise experienced at the varying prices sometimes realised for different marks, actually counterparts are one of the other, is almost always assignable to this cause.

WEEKLY PUBLI AUCTIONS OF CEYLON TEA during 1890 with average price realised;—

Week ending.		Number of Pkgs. offered in auction.		Avg. price per lb.		Av. Price per lb. for corresponding week 1889.
				d.		d.
Jan.	4th	526	...	11¾	...	10¾
	11th	14,152	...	11½	...	10¼
	18th	10,345	...	11½	...	10¼
	25th	8,147	...	11½	...	10¼
Feb.	1st	12,646	...	11¼	...	10¼
	8th	8,205	...	11	...	10¼
	15th	9,144	...	10¾	...	10¼
	22nd	8,793	...	10¾		10¾
March	1st	11,000	...	10½	...	10¾
	8th	10,950	...	9¾	...	10½
	15th	7,130	...	10¼	...	10¼
	22nd	10,596	...	10¼	...	10¼
	29th	12,940	...	10¾	...	10½
April	5th	4,277	...	10½	...	10¼
	12th	no sales	...	—	...	9¾
	19th	15,729	...	10¼	...	10½
	26th	17,050	...	10½	...	10
May	3rd	10.590	...	10¼	...	9¾
	10th	12,219	...	10½	...	9½
	17th	8,619	...	10½	...	9½
	24th	18,268	...	10½	...	9¼
	31st	2,534	...	10	...	9½
June	7th	22,856	...	10½	...	9¾
	14th	12,0[illegible]8	...	10¾	...	9¼
	21st	15,500	...	11¼	...	9
	28th	15,753	...	11	...	9
July	5th	8,384	...	10¾	...	9½
	12th	14,418	...	10¾	...	10
	19th	8,934	...	10¾	...	10¾
	26th	14,293	...	10½	...	11¼
Aug.	2nd	16,268	...	10¼	...	11½
	9th	2,947	...	10	...	10¾
	16th	19.369	...	10½	...	11¾
	23rd	17.966	...	10½	...	1/0¼
	30th	9,650	...	10¾	...	11¾
Sept.	6th	18,900	...	11	...	/0½
	13th	7,457	...	11¼	...	1/1¼
	20th	9,414	...	1/	...	1/1¼
	27th	812,90	...	1/0¼	...	/1¼
Oct.	4th	14,800	...	1/	...	1/1¾
	11th	7,184	...	1/	...	1/2
	18th	9,434	...	11¼	...	1/2
	25th	9,233	...	11¾	...	1/2¼
Nov.	1st	8,233	...	1/	...	1/1¾
	8th	4,708	...	10/¼	...	1/1¼
	15th	5,440	...	1/	...	1/0½
	22nd	10,613	...	11¾	...	11¾
	29th	10,313	...	11	...	1/
Dec.	6th	7,460	...	11¼	...	11¾
	13th	14,147	...	11	...	11¾
	20th	7,207	—	11	...	11¾

SUMMARY OF CEYLON TEA SOLD AT PUBLIC AUCTION in London between January 1st and December 1890, estimated quantity in lb. and averaged prices realised:—

Average price for the Year 10¾d per lb., against 10¾d in 1889, and 11¼d in 1888.

The initial letters following the estate names refer to the mean elevation, as follows:—

L (low) sea level up to 1,000 feet—H M (high medium) 2,500 to 3.500 feet—H H (highest) above 5,000 feet—M (medium) 1,000 to 2,500 feet—H (high) 3,500 to 5,000 feet.

Over 200,000 lb.		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Diyagama	H...	209,000	1	1½	1	1
Wallaha (CTP) Co.	HM...	484,000	1	0¾	1	1¼
Chapelton	H...	224,000	1	0¼	1	1¼
Campion	H...	228,500	0	11¾	0	11½
Galaha	M...	250,000	0	11¾	0	11¾
Mattakelly	H...	206,500	0	11¼	0	10¾
Glenalpin	H...	221,000	0	10¾	0	11¾
Gallamudina	M...	226,000	0	10½		—
Imboolpittia	M...	271,000	0	10½	0	11¼
K A W	HM...	568,000	0	10½	0	11
Dunedin (CTPCo.)	L...	201,000	0	10¼	0	9¼
Vellai-oya (EP&ECo.)	H...	325,500	0	10¼	0	11½
Darrawella (OBEC;	H...	200,500	0	10	0	10¾
Mariawatte (CTPCo.)	M...	541,500	0	9¾	0	11
Gallebodde	M...	200,000	0	9½	0	11
Sunnycroft	L...	203,000	0	9½	0	9
Lebanon Group	M..	203,000	0	9¼	0	8
100,000 lb. to 200,000 lb.						
Labukelle (EP&ECo.)	H..	101,000	1	3¼	1	1
Kotiyagalla	H..	109,000	1	3	1	0¼
Drayton	H..	145,000	1	1½	1	2
Kirkoswald	H..	176,500	1	1¼	1	1¼
Waverley	H..	100,000	1	1	1	1
Glendevon (OBEC)	H..	122,500	1	0¾	1	1
Bambrakelly & Dell	H..	197,500	1	0½	1	1¼
Invery (SCTCo.)	H..	127,000	1	0½	1	0¾
Tillyrie (CTPCo.)	H..	176,500	1	0¼	0	10
Ythanside	H..	122,000	1	0¼	1	0¼
Bogawautalawa	H..	117,000	1	0	1	1
Glenugie	H..	180,500	1	0	1	2½
Hope (EP&ECo.)	H..	176,000	1	0	0	11¼
Mahacoodagalla	H..	137,000	1	0	0	11
Ragalla	H..	107,500	1	0		—
St. Clair	H..	111,000	1	0	1	2¼
Annfield	H..	111 000	0	11¾	0	11
Hauteville	H..	127,500	0	11¾	1	0
Moray	H..	189,500	0	11¾	1	0½
Vallombrosa	H..	115,000	0	11¾	1	1¾
Bearwell	H..	124,000	0	11½	0	11½
Fordyce (LPCo.)	H..	109,500	0	11½	0	11¼
Gorthie	H..	124,500	0	11½	0	11¾
Rookwood	HH..	186,000	0	11½	0	11¼
Scarborough	H..	115,500	0	11½	0	10¾
Strathdon (SCTCo.)	HM	137,000	0	11½		—
Venture	H..	114,000	0	11½	0	11
Dunsinane	H...	111,500	0	11¼	1	0¾
Holyrood, E	H...	106,000	0	11¼	0	9½
IMP	H...	111,000	0	11¼	1	0¼
Lynstead	H...	106,500	0	11¼	0	11¾
Spring Valley	H..	181,000	0	11¼	0	10½
Waltrim	H...	124,500	0	11¼	0	10½
Wangieoya	H...	124,000	0	11¼	0	10¾
Wattegodde	H...	110,500	0	11¼	0	11¼
Adam's Peak	H...	124,000	0	11	0	10¼
Calsay	H...	129,000	0	11	1	0
Craigie Lea (OBEC)	H...	150,500	0	11	1	0

		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Kabragalla, M	H...	106,000	0	11	0	10½
Le Vallon	HM...	128,000	0	11	1	0
Lindula	M...	100,500	0	11	0	11¾
Mipitiakande	L...	148,000	0	11	1	0¼
Sogama (EP&EC)	HM...	143,500	0	11	1	0½
Alton (CTPCo.)	H...	123 000	0	10¾	0	9½
Kataboola	H..	108,000	0	10¾	0	11¼
Barnagalla	M...	150,500	0	10½	0	11¼
Castlemilk	M...	102,500	0	10½	0	11¼
Elkadua	HM...	156,000	0	10½	0	10¾
Hoonoocotua	H...	110,000	0	10½	0	10¾
Hunugalla	H...	103,000	0	10½	0	11¾
Kellie	M...	199,500	0	10½	0	10
Kudaoya (OBEC)	H...	114,500	0	10½	0	10
Laxapana	H...	147,500	0	10¾	0	11
Meddecombra (EP&ECo.)	H...	191,000	0	10½	1	0
Nilambe	HM...	130,000	0	10½	0	8½
Osborne	H...	109,000	0	10½	0	11
Abbotsford	HH...	116.500	0	10¼	0	9¼
Choisy & Rolleston	H...	111,500	0	10¼	0	11¼
Dalleagles	M...	109,000	0	10¼	0	10
Dikoya	H...	120,000	0	10¼	0	9½
Doteloya	M...	153,500	0	10¼	0	10
Elston	L...	134,500	0	10¼	0	10½
Glencairn	H...	126,000	0	10¼	0	10
Goorokoya	M...	113,000	0	10¼	0	10½
Great Western	H...	199,500	0	10¼	0	11
Hardenhuish and Lammermoor	HM...	121,000	0	10¼	0	10¼
Hatale	H...	134,500	0	10¼	0	11½
Hindagalla	M...	139,000	0	10¼	0	11
New Peradeniya OL&PCo.	M...	152,000	0	10¼	0	10½
Pen-y-lan	M...	164,000	0	10¼	0	9¾
Andangoddie (OL&PCo)	M...	161,500	0	10	0	10½
Arapalakande (EP&ECo)	L...	132,000	0	10	0	10
Hill Side	M...	103,000	0	10	0	9
Katooloya	H...	157,500	0	10	0	10½
Penrith	L...	132,000	0	10	1	0
Tyspany	H...	121,000	0	10	0	10½
Westhall	HM...	154,500	0	10	0	9¾
Dewalakande (CTPCo)	L...	133,000	0	9¾	0	10
Pambagama	L...	175,000	0	9¾	0	9½
Blackwater	M...	194,000	0	9½	0	9½
Delta	H...	112,500	0	9½	0	9½
Hunasgeria	H...	169,000	0	9½	0	9½
Kelani	L...	105,000	0	9½	0	9½
Narrangalla	M...	107,500	0	9½	0	11
Sembawatte	HM...	117,000	0	9½	0	10
Yataderia	L...	155,000	0	9¼	0	11
Yellangowry	M...	137,000	0	9¼	0	10
Aberdeen	HM...	130,500	0	9	0	9½
Kandaloya	M...	182,000	0	9	0	9¾
Luccombe	HM...	142,000	0	8½		—

50,000 lb. to 100,000 lb.

		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Mooloya	H...	56,500	1	2½	1	1½
Pita Katmalie	H...	58,500	1	1¾	0	11¼
Alnwick	H...	56,000	1	1½	1	3½
Henfold	H...	54,000	1	1		—
Kandapola	HH...	96,500	1	1	1	0¾
Pundaluoya	H...	50,500	1	1	1	0¼
Eltofts	H...	60,500	1	0¾	0	11½
Goatfell	H...	85,000	1	0¾	1	3¼
Kew	H...	88,000	1	0¾	0	11
North Cove	H...	74,000	1	0¾	0	10¼
St. John del Rey	H...	69,500	1	0¾	1	1¼
Erlsmere	H...	60,500	1	0½	0	10½
Errol	H...	63,000	1	0¼	0	10½
Cullodon	L...	78,500	1	0	0	10¾
Scrubs (CTPCo)	HH...	73,000	1	0	0	11½
Bogahawatte	H...	74,500	0	11¾	1	2
Brunswick	H...	58,000	0	11¾	0	11½
Elbedde	H...	99,500	0	11¾	1	0
Mahanilu	H...	69,500	0	11¾	1	0
Mayfield	H...	96,500	0	11¾	1	0¾
Mincing Lane (SCTCo)	H...	60,500	0	11¾	1	0½
Nayabedde	H...	55,500	0	11¾	0	10¼
St. Vigeans	H...	52,500	0	11¾	0	11
Albion	H...	72,500	0	11½	0	11½
Glassaugh	HH...	65,000	0	11½	1	0¼
Kandenewera	HM...	53,000	0	11½	0	10
Loolcondera (OBCE)	H...	64,500	0	11½	1	1¼
Mocha	H...	79,000	0	11½	1	0¼
New Forest	H...	56,500	0	11½	1	0
New Valley	H...	71,500	0	11½	0	11¼
Norwood (EP&ECo)	H...	75,500	0	11½	1	2
Poengalla	HM...	81,000	0	11½	0	10½
Rangbodde	H...	93,000	0	11½	1	0
Rangalla	HM...	80.000	0	11½	1	0¼
WA	H...	70,000	0	11½	0	11
Agra Ouvah	H...	76.000	0	11¼	0	11¾
Balmoral	H...	68,000	0	11¼	0	11¾
Beaumont	M...	78,000	0	11¼	0	11¾
Claverton	M...	67,000	0	11¼	1	0
Glentilt	H...	68,000	0	11¼	0	11¼
Hornsey	H...	50,000	0	11¼	0	10½
Lawrence	H...	78,500	0	11¼		—
Mount Vernon	H...	91,000	0	11¼		—
Newton	H...	58,500	0	11¼	0	11¼
Summerville	H...	66,000	0	11¼	1	0¼
Fetterosso	HH...	94,000	0	11	0	10½
Geddes	H...	75,000	0	11	0	11
Gikiyanakanda	L...	76,500	0	11	0	11¾
Glentaaffe	H...	62,500	0	11	1	0
Heeloya	H...	62,000	0	11	0	11½
Lippakelle	H...	74,000	0	11	1	0
Talawakelle	H...	80,000	0	11	0	11½
Theresia	H...	51,500	0	11		—
Windsor Forest	M...	70,500	0	11		—
Blair Athol	H...	58,500	0	10¾	0	10
Doragalla	HM...	79,500	0	10¾	0	10¾
Fairlawn	H...	53,500	0	10¾	0	11¾
Glengariffe	H...	51,500	0	10¾	0	11
Kadienlena	M...	63,500	0	10¾	0	10¼
Kirrimittia (EP&LCo)	M...	51,500	0	10¾	0	11¼
Lamiliere	H...	72,000	0	10¾	0	10¾
New Peacock	H...	82,500	0	10¾	0	9
Niloomally (OBEC)	H...	88,500	0	10¾	1	0
Oliphant	HH...	55,500	0	10¾	0	9¼
Oodewelle	HM...	54,500	0	10¾	1	1¼
Sanquhar	HM...	51,000	0	10¾	0	10¾
Sinnapittia (OBEC)	M...	71,500	0	10¾	0	11½
Somerset	H...	75,500	0	10¾	0	11½
Templestowe	H...	81,000	0	10¾	1	0¼
Atherfield	L...	64,000	0	10½	0	10¾
Bloomfield	H...	66,500	0	10½	0	10¾
Castlereagh	H...	67,500	0	10½	0	11
Dedugalla	M...	60,500	0	10½	1	0
Dessford	H...	72,500	0	10½	1	0
Dimbula	H...	98,500	0	10½	0	11½
Galloola	H...	83,000	0	10½	0	10½
Glendon	L...	58,000	0	10½	0	10
Great Valley	HM...	51,500	0	10½	0	11
Havilland (OBEC)	M...	91,000	0	10½	0	10½
Kalcogalla	HM...	72,500	0	10½	1	1
Kabragalla (M)	H...	77,500	0	10½	0	10½
Kelaniya	H...	59,000	0	10½	0	10
Marguerita	HH...	53,000	0	10½	0	11½
Minna	H...	84,500	0	10½	0	9¾
Nayapane	HM...	66,500	0	10½	1	1¼
Needwood	H...	56,000	0	10½	0	10¼
Norton	HM...	50,500	0	10½	0	9¾
Oononagalla	H...	91,000	0	10½	0	9¼
Ottery	HM...	96,000	0	10½	0	10¼
Ovoca	H...	79,000	0	10½	0	11½
Peradenia	H...	69,500	0	10½	0	11¾
Rickarton (OL&PCo)	HM...	71,000	0	10½	0	11¼
Torrington	H...	65,000	0	10½	0	10¼
Torwood	L...	57,500	0	10½	0	9¾
Uva	H...	74,500	0	10½	0	9¼
Wewolmadde	M..	66,000	0	10½	0	10½

		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Weyweltalawa	M...	64,000	0	10½	0	10¾
Agra	H...	64,500	0	10¼	0	10
Avisawella	L...	73,500	0	10¼	0	9¾
Degalessa	L...	77,500	0	10¼	0	10¾
Dunkeld	H...	70,500	0	10¼	0	10½
Gammadua	H...	93,500	0	10¼	0	10
Gangwarily	M...	50,500	0	10¼	0	9¾
Hayes	M...	81,000	0	10¼	0	8¾
Kallebokka	H..	58,500	0	10¼	0	11¼
Kelvin	M...	72,500	0	10¼	0	9¾
Lauderdale	HM...	60,500	0	10¼	0	9½
Maha Eliya	H...	70,000	0	10¼	0	10¼
Mahalma	L...	56,000	0	10¼	0	11¼
Orwell	M...	71,000	0	10¼	0	9½
Polgahakande	L...	62,500	0	10¼	0	10½
Putupaula	L...	62,500	0	10¼	0	10¼
Queensberry	H...	61,000	0	10¼	0	11½
Raxawa	HM...	67,000	0	10¼	0	10½
Shrubs Hill	HM...	73,500	0	10¼	1	0½
Stonycliff	H...	67,000	0	10¼	0	9¾
Wattylakel	H...	80,000	0	10¼	0	11¾
Dambulagalla	H...	93,500	0	10	0	11
Densworth	L...	80,500	0	10	0	10½
Ernan	L...	56.500	0	10	0	10
Gallaheria	H...	93,000	0	10	0	9¾
Gingranoya	HM...	53 500	0	10	0	11¼
Glassel	L...	89,500	0	10	0	10¼
Goomera	H...	93,500	0	10	0	11
Hatherleigh	M...	67,000	0	10	0	8¾
Heatherly	M...	81,000	0	10	0	11
Ingurugalle (E P & E Co.)	M...	70,500	0	10	0	10¾
Leangapella	H...	68,000	0	10	0	9¾
Mahatenne	M...	56,000	0	10	0	9¾
Mottingham	...	83,500	0	10		—
Nyanza	HM...	68,500	0	10	0	10
Parusella	L...	64,000	0	10	0	9¼
St. Helens	M...	57,000	0	10	0	9¼
Strathellie	M...	66,000	0	10	1	0
Troy	L...	54,000	0	10	0	9¼
Tunisgalla	H..	67,500	0	10	0	11½
Cottaganga	H..	54,500	0	9¾	0	10
Emelina	H..	88,500	0	9¾	0	10¼
Glenalla	L..	63,500	0	9¾	0	10¼
Happugahalanda	M..	68,000	0	9¾	0	9¼
Lankapura	H..	87,000	0	9¾	1	0¼
Lavant	L..	88,000	0	9¾	0	9½
Ambetenne	L..	61,000	0	9½	0	9½
Digalla	L..	57,000	0	9½	0	9½
Ivanhoe	H..	500	0	9½	0	10
Knuckles Group	HM..	63,000	0	9½		—
Binoya	HM..	75,000	0	9¼		9¾
Cocoawatte	..	52,000	0	9		—
Indurana	L..	65 500	0	9¼	0	9¾
Barra	M..	85,500	0	8½	0	8½

20,000 lb. to 50,000 lb.

		About lb.	1890. s.	d.	1889. s.	d.
Portswood	HH..	45,000	1	4	1	4¼
PDM	H..	28,500	1	2	1	0¼
Sheen	H..	47,500	1	2	1	3½
Charley Valley	H..	39,000	1	1¾	1	2
Condagalle (EP&ECo.)	H..	43,000	1	1½	1	0¾
Denmark Hill	HH..	36,000	1	1½		—
Loinorn	H..	35,500	1	1½	1	1¾
Ouvahkellie	H..	31,500	1	1½	1	0½
Elgin	H..	42,500	1	1¼		—
Frotoft	H..	48,500	1	1¼	1	0¾
Heathersett	H..	46,500	1	1¼	1	2¼
Hoolankande	HM..	36,500	1	1¼	1	9
Hantane	M...	43,500	1	1	0	10½
Warwick	H...	25,000	1	1	0	11¼
Wootton	H ..	38,000	1	1	1	0
Agarsland	H...	29,500	1	0¾	0	11¼
Bramley	H..	35,500	1	0¾	0	11
Combewood	HM...	25,500	1	0¾		—
Court Lodge	HH...	22,500	1	0¾	1	0
Edinburgh	H...	44,500	1	0¾	1	0
Mahagastotte	H...	26,000	1	0¾		—
Upper Cranley	H...	22,000	1	0¾		—

		About lb.	Av. price per lb. 1890. s.	d.	1891. s.	d.
Agrakande	H...	38,500	1	0¼	1	1¾
Braemore	H...	37,500	1	0¼	0	9¾
Dammeria	HM...	24,500	1	0¼		—
Deeside	H...	48,000	1	0¼	1	0¼
Glasgow	H...	34,000	1	0¼	1	1
Macduff	H...	39 000	1	0¼		—
Melfort	H..	44,500	1	0¼	0	11¾
Brownlow	H .	21,500	1	0		—
Friedland	HH...	35,500	1	0	0	10¼
Gartmore	H...	31,500	1	0		—
Gonakelie	HM...	20,500	1	0	0	11
W. Holyrood	H...	28,000	1	0	0	9½
Kowlahena	H...	27,000	1	0	1	0½
Middleton	H...	25,000	1	0	0	11¼
Muliguseny	...	43,000	1	0		—
Poolbank	H...	28,500	1	0	1	0
Broughton	H...	39,000	0	11¾	1	2
Devonford	HH..	34,500	0	11¾		—
Rahatunagoda	H..	38,000	0	11¾	1	0¼
Suriakande	H..	49,500	0	11¾	0	9¾
Thornfield	H..	48,500	0	11¾	0	11
Clontarf	L..	46,500	0	11½		—
Dunnotar	H..	23,000	0	11½		—
Gonomotava	H..	48,500	0	11½	1	0¼
Hatton	H..	29,000	0	11½	0	11¾
Morar	H..	48,000	0	11½	1	0
Rajatalawa	HM..	28,000	0	11½	1	1
Aadneven	H..	23,500	0	11¼	0	10
Bathford	H..	32,000	0	11¼	1	0¼
Detenagalla	H..	34,000	0	11¼	0	10½
Dunlow	H..	43,500	0	11¼	0	10¾
Frogmore	H..	34,000	0	11¼	0	10¼
Heatherton	HM..	28,500	0	11¼		—
Ingestre	H..	20,500	0	11¼		—
Kirklees	H..	36,000	0	11¼	0	11½
Mahousa	M..	41,000	0	11¼	1	0¼
New Caledonia	H..	48,000	0	11¼	0	11¼
Panmure	H..	30,000	0	11¼	0	9½
Portree	H..	38,000	0	11¼		—
Stellenberg (OBECo.)	H..	48,500	0	11¼		—
Broad Oak	H..	35,000	0	11	0	10¼
Cattaratenne	HM..	23,500	0	11		—
Deanstone	H..	34,500	0	11	0	11
Fruit Hill (LPCo)	H..	48,000	0	11	0	11
Holmwood	H..	34,000	0	11	0	9
Hopton	HM..	20,500	0	11		—
Kelliewatte	H..	45,000	0	11	0	10½
Maskeliya	MM..	36,000	0	11		—
Nicholoya	HM..	25,500	0	11	1	0
Pansalatenne	M..	44,000	0	11	0	10½
Penrhos	M..	36,000	0	11	0	11¼
Pine Hill	M..	27,500	0	11	0	11¾
St. John's	H..	41,000	0	11		—
Aigburth	HM..	26,500	0	10¾	0	10
Ampittia (LPCo.)	H..	49,000		10¾	1	1¼
Bitterne	H..	45,500	0	10¾	0	9¾
Blackstone	H..	45,500	0	10¾	1	0¾
Caskie Ben	H..	35,500	0	10¾	0	11
Dangkande (OBECo)	HM	37,000	0	10¾	0	11½
Delpotonoya	H..	38,500	0	10¾	0	10½
Ferndale	H..	49,500	0	10¾	0	11¼
Galella	H..	26,000	0	10¾	0	8¼
Haputale	H..	24,000	0	10¾		—
Kintyre	H..	52,000	0	10¾	0	10¼
—,,— (Green)	H..	13,500	1	1¼		
Meria Cotta	H..	32,500	0	10¾	0	11¼
Relugas	HM..	22,000	0	10¾		—
Tommagong	HH..	39,000	0	10¾	1	0
Warriapola	M..	39,000	0	10¾	0	10½
Wavahena	M..	31,500	0	10¾	1	0½
Wellekelle	H..	26,000	0	10¾	0	11
Zululand	M..	21,000	0	10¾		—
Aldie	H..	20,500	0	10½		—
Amblamana	HM..	47,000	0	10½	1	0¾
Battagalla	H..	21,000	0	10½	0	10¼
Battalgalla	H..	44,000	0	10½		—
Craig	H..	40,000	0	10½	0	10
Duckwari	HM..	27,000	0	10½		—
Epplewatte	M..	43,000	0	10½	0	10
Glencoe	H..	47,000	0	10½	0	9
Kinloch	H..	30,500	0	10½		—
Kottagalla	H..	28,500	0	10½		—

		About lb.	Av. price per lb 1890. s.	d.	1889. s.	d.
Lagalla	HM..	33,000	0	10½	0	11
Little Valley	HM..	33,500	0	10½	—	
Loonagalla	HM..	35,500	0	10½	—	
Madoolkelle	HM..	21,500	0	10½	0	9½
Midlands	HM...	46,000	0	10½	0	10¼
Mount Pleasant	HM...	28,000	0	10½	—	
Mousakelle	H...	41,500	0	10½	0	10
Old Madegama	HM...	38,500	0	10½	—	
Riverside	M...	40,500	0	10½	—	
Situlaganga	H...	25,000	0	10½	—	
Taprobana	H..	38,000	0	10½	1	0
Theberton	HM...	22,000	0	10½	0	8½
Verelapatna	H..	24,500	0	10½	0	11½
Berragalla	H..	36,500	0	10¼	0	11¾
Campden Hill	M..	22,000	0	10¼	0	9
Chetnole	HM..	39,500	0	10¼	0	10¾
Deyanella	M..	35,500	0	10¼	1	1
Fassifern	H..	23,500	0	10¼	—	
Gona	M..	34,500	0	10¼	—	
Kaluganga	L..	29,000	0	10¼	0	9¼
Karagastlaawa	H..	29,500	0	10¼	1	2½
Kelburne	H..	38,500	0	10¼	—	
Marlborough	H..	27,000	0	10¼	—	
Melrose	HM..	33,000	0	10¼	—	
Ooragalla	M..	40,000	0	10¼	—	
Oppalgalla	HM..	31,000	0	10¼	1	0½
Peacock Hill	HM..	42,500	0	10¼	1	2½
Selegama	HM..	23,000	0	10¼	0	8½
St Leys	H..	40,000	0	10¼	0	10¾
Ugieside	M..	33,000	0	10¼	0	8
Warleigh	HM..	41,500	0	10¼	0	9¼
Wiltshire	HM..	25,000	0	10¼	0	10½
Woodcote	M..	28,000	0	10¼	0	9½
Woodstock	H..	31,000	0	10¼	0	11¾
Yarrow	HM..	21,500	0	10¼	0	11¾
Amunamulle	H..	40,000	0	10	0	11¾
Beverley	M..	41,000	0	10	0	9
Bismark	H..	41,000	0	10	0	9¾
Brae	—..	37,000	0	10	0	8½
Dahanaike	HM..	30,000	0	10	0	10
Damblagolla	HM..	36,000	0	10	0	9½
Doronakande	L..	39,500	0	10	0	9¾
Ekolsund	H..	44,000	0	10	0	10
Heminford	L...	44,500	0	10	—	
Lower Haloya	M...	49,500	0	10	0	9
Maryland	M..	29,500	0	10	—	
Pasbagie		31,500	0	10	—	
Salem	M..	27,000	0	10	—	
St. Helens	M...	43,500	0	10	0	9¼
Stockoholm	H..	24,500	0	10	—	
Wereagalla	L..	26,500	0	10	0	9
Agra-oya	M .	30,000	0	9¾	0	10¼
Ardross	L...	39 000	0	9¾	0	9
Arslena	M..	46,000	0	9¾	—	
Blackwood	H..	22,500	0	9¾	1	0¼
Cabragolla		34,500	0	9¾	—	
Ederapolla	L...	40,000	0	9¾	0	9¾
Galat/	M..	31,000	0	9¾	0	10½
Gavatenne	HM...	27,500	0	9¾	0	10¾
HGA	H..	45,000	0	9¾	0	9¾
Hangranoya	M..	31,000	0	9¾	0	9½
Koladenia(EP&ECo,)	M...	34,500	0	9¾	0	8¾
Matara-oya		31,500	0	9¾	—	
Warriagalla	M...	27,000	0	9¾	0	10
Wattawelle(OBECo.)	M..	47,000	0	9¾	0	9½
Dalguise	HM...	40,500	0	9½	—	
Dehiowita	M...	29,500	0	9½	—	
Ellagalla	M...	37,000	0	9½	—	
MK	HM..	28,500	0	9½	0	10
Putiya	..	25,000	0	9½	—	
Saumarez	L..	48,500	0	9¼	0	9½
Amblakande	M..	39,500	0	9¼	—	
Balgowrie	L..	27,000	0	9¼	0	7½
Donegama	H..	30,500	0	9¼	0	10½
Laxapanagalla	M..	42,000	0	9¼	0	8¼
Morton	L..	34,000	0	9¼	0	8¾
Nrrtakande	M..	37,000	0	9¼	0	8¼
Orion	M..	23,000	0	9¼	0	10½
Aoerfoyle	HM..	41,000	0	9	0	9½
Coolbawn	M..	20,500	0	9	0	10
Florence	M...	27,500	0	9	0	8
Hiralouvah	HM...	22,000	0	9	0	10½
Lyegrove	M...	26,500	0	9	0	10
St. Leonards	L...	24,500	0	9	0	9½
Udabage	L...	35,500	0	9	0	9½
Gallewatte	HM...	27,000	0	8¾	0	8¾
Kennington	ML...	22,500	0	8¼	—	
Kurulugalla	HL...	22,000	0	8½	0	10
Topare	HM	30,000	0	7¾	—	

Estimated relative Yield and Average price realised for the different CEYLON TEA DISTRICTS compiled from the Public Auctions held in London between January 1st and December 31st, 1890:—

	lbs. about	Av. Price per lb. about	Av. Price per lb. in 1889. about
Bogawantalawa ...	1795000 ...	1/0¼ ...	1
Newara Eliya, Maturata & Uda Pusselawa	1450000 ..	1/0¼ ...	1/0½
Dimbula	5700000 ...	0/11¾ ...	0/11¾
Hewaheta	1050000 ...	0/11½ ...	0/11½
Pusselawa, Kotmale, Pundaloya and Ramboda	3050000 ...	0/11¼ ...	0/11¼
Dikoya	3000000 ...	0/11 ...	0/11½
Matale & Hunasgeriya	1550000 ..	0/11 ...	0/10½
Kelani Valley ...	2800000 ...	0/10¾ ...	0/10
Maskeliya	2750000 ...	0/10¾ ...	0/11
Uva	1500000 ...	0/10¾ ...	0/11
Kalutara	750000 ..	0/10½ ...	0/10½
Nilambe and Hantane	1050000 ...	0/10½ ...	0/11
Ambegamuwa, and Lower Dickoya	2800000 ...	0/10¼...	0/10¾
Kaduganawa & Aalagalla	750000 ..	0/10¼ ...	0/10¾
Knuckles, Kallebokka, Rangalla &c. ...	1900000 ...	0/10¼ ...	0/10¾
Dolosbage and Yacdessa	2550000 ..	0/10 ...	0/10
Saberagamua	750000 ...	0/10 ...	0/9½
Galle	150000 ...	0/9¼ ...	—
Lower District ..	35000 ..	0/9 ...	0/9¾

N.B.—Untraceable marks to the extent of about 3,000,000 lb. averaging 9¾d per lb. are not included in the above estimate.

HOME CONSUMPTION of China and East Indian growths 10 years ago, 5 years ago, and last year :—

	China. lbs.	Indian & Ceylon. lbs.	
1880	111,307,000	43,807,000	or 28¼ p. c. of the total.
1885	106,310,000	68,890,000	,, 39½ do do
1890	57,500,000	136,500,000	,, 70½ do do

N.B.—In 1889 the consumption of Indian and Ceylon was 67⅔ per cent.

Monthly Deliveries of Ceylon Tea during the past five years.

	1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
January	2215670	1945932	1029318	535280	285400
February	2126498	1915114	1060546	494520	235390
March	2081078	2137838	1084850	616230	316790
April	1334678	2165016	1238420	657420	316240
May	5019890	2893385	1305960	779130	429380
June	3813768	2667890	1594208	780570	569710
July	3932286	3667728	2266106	998590	766310
August	3793038	3200918	2116702	1341790	817780
September	3960440	2900718	1873396	1197220	786520
October	3640690	2655188	1885440	1008950	683770
November	3162432	2177092	1689480	790010	566240
December	2772302	1889324	1408134	741900	471210
	37652770	30216143	18552560	9941610	6244740

Monthly Imports of Ceylon Tea during the past five years :—

	1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
January	2573914	2660244	1356784	578250	226160
February	3051404	1971772	1261250	713490	394470
March	3008554	2476842	1243966	746280	399480
April	3403832	3257796	1106462	679000	705180
May	4067074	2681694	2015920	886780	692730
June	3693204	3649132	2139242	1230240	623560
July	5142768	2883564	2040074	1650270	880820
August	3508780	1716628	2412362	1178610	813870
September	3244802	2673498	1452408	781570	681406
October	2371260	1953520	1691792	815110	427160
November	3056966	2516050	1588964	872330	499750
December	2888626	2746054	201 462	1193030	530320
	40011184	31189794	20324286	11324960	6874900

STOCK of Ceylon tea in Bonded Warehouses at the close of the past five years:—

1890.	1889.	1888.
8,621,824 lbs.	6,303,954 lbs.	5,129,978 lbs.
1887.	1886.	
3,149,430 lbs.	1,660,460 lbs.	

Board of Trade Returns of Imports and Home Consumption of Tea from all Countries during the past five years:—

From	1890. lbs.	1889. lbs.	1888. lbs.
Brit. East Indies	146,260,642	127,160,409	113,004,692
,, China	73,635,351	88,848,574	105,424,271
Other Countries	4,758,378	5,593,677	5,189,515
Imports ...	224,654,371	221,602,660	223,618,478
H. Consumption	*194,008,492	†185,621,800	185,556,214

From	1887. lbs.	1886. lbs.
Brit. East Indies ...	97,830,117	80,987,351
,, China ...	119,739,116	145,111,596
Other Countries ...	5,194,054	4,796,345
Imports	222,763,287	230,895,292
Home Consumption...	183,635,885	178,894,151

* Of this total 101,961,666 lbs. were Indian, 34,516,469 lb. Ceylon, 54,873,592 lb. China, and 2,656,745 lb. from other countries.

† Of this total 124,408,798 lb. were British East Indian, 59,513,397 lbs. China, and 1,699,600 lb. from other countries.

Exports of Tea (of all kinds) during the past five years.—

1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
*36,967,137	35,661,900	37,956,840	34,741,390	44,413,050

* Of this total 2,624,579 lbs. were Indian, 1,431,931 lbs Ceylon, 31,493,125 lb. China, and 1,417,502 lb. other countries.

Stock of Tea (of all kinds) in Bonded Warehouses at the close of the past five years:—

1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
103,229,153	109,907,332	110,805,783	113,027,688	109,678,467

THE REPORTS FROM DELI, the tobacco country on the north-east coast of Sumatra, are still very favourable for the tobacco cultivation, and it is expected that the present crop will be the largest one ever harvested in Deli.—*Colonies and India.*

NEW STEAM FUEL FOR LOCOMOTIVES.—It is stated that a substitute for coal in the raising of steam purposes is now being successfully carried out on one of the leading lines of railway, and that two eminent London engineers have patented a system by which a ton of residual oil costing £3 10s may be made to create 8,000-horse power for a space of one hour, and generally to do twenty times the work of coal. It is also stated that the experiments made by the Great Eastern Railway have turned out most successful, and that Mr. Holden, the locomotive superintendent of the line, has patented an injector in connection with the fluid, and that it is now being used on about a dozen locomotive engines as an auxiliary to coal. The fluid, it is stated, is tar, to which is added some green oil from tar works, and the cost is three half-pence per gallon. Each engine uses about 12lb. of coal and one gallon, or 11 lb. of fluid fuel per train mile, as against 34 lb. of coal. The relative cost, it appears, is rather less than coal at the present price of both, but the value of the injector, it is asserted, is seen especially on gradients, when steam can be got up instantly by touching a tap at the hand of the driver.—*Railway News.* [All this ought to be good news for many Ceylon tea planters looking to the future, —ED. *T. A.*]

LIBERIAN COFFEE in and in the neighbourhood of Colombo is all out in a splendid blossom at present, the beauty and fragrance of which are very attractive to bipeds as well as bees. Many of the trees are at the same time, laden with fruit in all stages from green to dark purple as well as with the snowy white blossom. If the native villagers took to cultivating this tree as they do coconuts, they certainly should never be at a loss for a supply of coffee for their own needs.

A REMEDY FOR MALARIA.—Mr. G. Yeates Hunter, late Brigade Surgeon of the Bombay Army, writing to the *Financial News*, says:—"There would seem to me to be little cause for surprise at the reduction in the price of quinine, when it is borne in mind that the Indian kreat is now generally admitted to be, in many respects, superior to quinine. To my knowledge halviva—a preparation of kreat—answers admirably in controlling fever, and also in repairing the mischief wrought by quinine in that large number of patients who suffer from its ill-effects, evidenced by head symptoms, general malaise, intense irritability, &c. After more than 20 years' experience in India of the comparative value of quinine and kreat, I believe that the latter will be more and more recognised by the medical profession as the safest and best remedy against malaria.—*Pioneer.*

THE SEASONS FOR FELLING TREES FOR TIMBER AND FIREWOOD are thus indicated in the *Indian Forester*:—

On the season in which trees are felled depend the technical properties of the wood, and even the possibility of carrying out the work, for labour may not be available in sufficient quantity and at reasonable cost throughout the year, and malaria or heavy rain or snow may be a bar to all operations.

To prevent cracks timber should be allowed to season slowly. Hence it should be felled in damp and cool (if possible, even cold) weather. Where there is a true winter, felling in winter also preserves the wood from fermentation of the sap, from infection by fungus spores, and from the attacks of insects. With regard to durability alone, the theoretically best time for felling occurs when the trees contain their minimum of reserve materials that is to say, generally just after the new flush of leaves is out. But this season can be observed only when it does not coincide with the appearance of new seedlings, which the felling and export operations are bound to destroy; or with the season of heavy rains, during which the ground would be soft and muddy and the advance growth, if there is any, full of tender and easily-injured shoots. It may of course be observed in coupes that are to be clear-felled and then re-stocked artificially. For the safety of young growth the best time for felling is the season of repose, when the plants are least fragile and possess their greatest recuperative power; but on the higher ranges of the Himalayas the snow lies too heavy for felling to take place then without risk to human life, and, as export must take place during the following summer, most of the trees have to be cut in spring, while the seedlings are only just sprouting or coming up from seed. As regards firewood, we know that the quicker it dries, the better it is; also that it is heavier the more full it is of reserve materials. Hence in felling for firewood, the best time of the year, provided sylvicultural exigencies do not bar it, is when dry, warm weather prevails; and if this coincides with the season of repose, so much the better. The time for felling coppice is limited, by purely sylvicultural considerations, to this season, the only exception being when bark for tanning is the chief produce sought, in which case the felling must be effected during the first three or four weeks of the season of vegetation, unless the trees are barked standing, or this period falls within the rainy season. In the case of charcoal-making the charcoal-burners must have a sufficiently long spell of fairly dry weather in which to complete their work. Cleanings and early thinnings in which the poles are cut as they are selected, must, of course be effected while the forest is in full leaf

The Quinine Ring.—The sequel to the recent efforts of the American quinine manufacturers to establish a quinine combination is given as follows in the last report of Messrs. Schoellkopf, Hartford and MacLagan, of New York:—"There can be no doubt we are in for an era of cheap quinine in the States, for a fierce war of prices is raging here, and is likely to grow worse. The representative of an American factory, having failed signally in his recent attempt to beguile the European makers into some sort of combination or arrangement, persuaded his people to enter on an aggressive course to coerce the recalcitrant German factory (supposed to be the Brunswick) to come to terms. The outcome is anxiously watched, but the fight is expected to be a long one, especially, as it is generally believed here that our manufacturers can supplement their output by using the ammunition of their enemies in the battle without any great loss to themselves. Meanwhile the large Philadelphia maker looks on, and keeps his price up. One good effect this quarrel will have—it will relieve the European market of considerable surplus stock.—*Chemist and Druggist*, March 21.

The Tea Trade between China and Tibet.—In "Through Eastern Tibet and Central China," by Mr. Woodville Rockhill, in the *Century* for March, the following occurs:—

The road was covered with long files of heavily loaded porters trudging slowly on to Ta-chien-lu, and in every tea-house their huge loads were placed on benches while the frugal coolies refreshed themselves with a cup of tea or a bowl of bean-curd and a chunk of corn-bread. Most of them were carrying tea from Ya-chou or some neighbouring town, about one hundred and fifty miles away, to be taken later, on yaks or mules, into Tibet. They were of all ages, and I was surprised to see among them not a few women and small children. The packages of tea, each about four feet long, six inches broad, and three to four thick, and weighing from seventeen to twenty-three pounds, are placed horizontally one above the other, the upper ones projecting so as to come over the porter's head. They are held tightly together by coir ropes and little bamboo stakes; straps, also of plaited coir ropes, pass over the porter's shoulders, while a little string fastened to the top of the load helps to balance the huge structure, which it requires more knack than strength to carry, for its weight must bear on all the back and only slightly on the shoulders. In their hands the porters carry a short crutch which they place under the load when they wish to rest without removing it from their backs. The average load is nine packages, or from 190 to 200 pounds, but I passed a number of men carrying seventeen packages, and one had twenty-one. A man, I was told, had a few years ago brought an iron safe weighing four hundred pounds for Mgr. Biet from Ya-chou to Ta-chien-lu in twenty-two days. Old or decrepit people commonly travel along this road borne on the backs of porters. Many of the women porters carried seven packages of tea, nearly two hundred pounds, and children of five and six trudged on behind their parents with one or two. The price paid for this work is twenty tael cents (about twenty-five cents) a package, and it takes about seventeen days to make the trip from Ya-chou. So far as my knowledge goes there are no porters in any other part of the world who carry such weights as these Ya-chou tea-coolies; and, strange as it may appear, they are not very muscular, and over half of them are confirmed opium smokers.

There is an illustration, showing some of these tea carriers with their loads on their backs. The Bhutias of Darjiling are also noted for their carrying powers, taking enormous loads of tea lead and other heavy material on their backs up to Darjiling from the foot of the mountains. There is a story, similar to that related above, of an iron safe being carried up to Darjiling on the back of a Bhutia.

The Products and Manufactures of the coconut palm are thus noticed in "Notes by the Way" in the *Jamaica Gleaner*:—

The original design of a coconut trophy has been partly carried out by the manager who has arranged the coconuts in their various stages round the base of the tree in the Jamaica court, and shown the coir and the fibre beside it, while ranged round the sides of the interior are useful household articles manufactured from the fibre, the latter being exhibited by a London firm. I recommend my readers to see this instructive exhibit.

Cardamoms.—Cardamoms grow wild in the Ceylon jungles, but about fifteen years ago they began to be cultivated in several districts of the island by European planters. The results of the venture turned out unexpectedly profitable, the yield having occasionally been as high as 400 lb. per acre. Until a few years ago cardamoms were propagated only from the rhizomes, or bulbs, but since then it has been shown that they can be successfully grown from seed. Until not very many years ago cardamoms were imported exclusively from the Indian mainland, and a considerable quantity, including some of very fine quality, are still drawn from that country; but since the cultivation has been taken up in Ceylon that island has altogether eclipsed the Indian exports. Indian cardamoms are usually imported in large cases, containing from $1\frac{1}{2}$ to 2 cwt. and the Ceylon variety in boxes usually varying from 40 to 80 lb. in weight. The average crops in Ceylon during the last few years have been about 300,000 lb.—*Chemist and Druggist.*

Injurious Insects in 1890.*—The 14th annual report on the ravages of injurious insects amongst our farm and garden crops, which Miss E. A. Ormerod, the able entomologist to the Royal Agricultural Society, issued last week, is a most satisfactory publication. When *The Times* called attention to the first very small report issued in 1877 the subject of economic entomology was almost unknown, whereas now it is recognized as an integral portion of agricultural teaching at the whole of our leading educational institutions. That all this has been brought about from the initiative work by Miss Ormerod must not only be gratifying to that lady, but should be matter of satisfaction to agriculturists and gardeners. The present pamphlet does not differ in form from those that have preceded it. In all 26 distinct attacks by injurious insects and eelworms are fully described and illustrated. This means—as was stated in the history of "British Agriculture in 1890," which appeared in *The Times* a few weeks ago—that last year was an average one so far as insect damage was concerned. Nearly all our common crop pests were present, but only a few really did any serious damage. There is, therefore, no need to refer to these at length. The chief lessons of the year are as to the use of more effective insecticides, such as "Paris Green." The use of these has been considered somewhat dangerous owing to their poisonous character, but with a fuller knowledge of the strength necessary to destroy attack Miss Ormerod thinks the time has come when they may be safely recommended for more general use. In one case a correspondent reports that he last year sprayed his trees ten times with Paris Green (2oz. to 20 gallons of water) with good effect. Although his fowls had a free run all over the field none were injured. In the use of these poisons, however, it is strongly recommended that farm animals should never be allowed to pasture or feed under trees that are being, or have recently been, so sprayed. The chapter dealing with this subject is very interesting, and may be said to exhaust the subject.—London *Times.*

* "Report of Observations of Injurious Insects and Common Farm Pests during the year 1890, with methods of Prevention and Remedy." Fourteenth report. By Eleanor A. Ormerod, F. R. Met. Soc., &c. London: Simpkin, Marshall, Hamilton, Kent, and Co, (Limited). 1891.

CEYLON UPCOUNTRY PLANTING REPORT.

CEYLON PRODUCTS IN THE MARKETS OF THE WORLD—JAVA VERSUS CEYLON KAPOK IN AUSTRALIA—CEYLON METHOD OF PACKING AND FREIGHTS—RAILWAY RECEIPTS FOR TEA BOXES—A SHORT SINHALESE HARVEST—COFFEE CROPS—FLUSH OF TEA—COOLIES.

April 2nd.

It is not often that a Ceylon product has to take a second place in the markets of the world. We are so much accustomed to a front seat that we have begun to look upon it as a right, and if not awarded, inquire the reason why. It is our pride, more than our pocket that is offended when even one of our minor products runs with the neck, instead of leading as we hold that all Ceylon things should do.

One of those minor products which does no credit to the name of Ceylon is Kapok—the tree cotton. It grows well enough, and ought to do well enough, but in the Australian markets it is a drug and cannot get a buyer, if kapok from Java can be had at the time. Now the Java kapok is, I understand, exactly the same as our own, and the reason why it is readily bought up, at from 8d to 9d a lb., while Ceylon kapok is hard to move even when offered at 5d to 6d is simply a matter of preparation. Java kapok reaches the Australian markets packed in mat bags, thoroughly teased out, and free from seeds, whereas the Ceylon article has been subjected to hydraulic pressure, has been very imperfectly cleaned—not only seeds but even the core remaining, and the cotton often in little lumps.

There is no doubt that by the Ceylon method, of having the cotton heavily pressed, there will be a considerable saving in freight, but upholsterers and especially mattress-makers dislike it. It breaks the spring of the cotton fibre, and a mattress made of the Ceylon kapok is heavy and solid, whereas a Java kapok one is light and elastic. A gentleman who has just come up from the Australian Colonies, and to whom I am indebted for the above information, was most emphatic on the positive dislike which existed among buyers of kapok, to any of it coming from Ceylon. It was simply because freight from Java was not always to be got, and as a consequence the market was sometimes wholly devoid of the Java article that the kapok of Ceylon got an innings at all. Now this is not a hard matter to remedy. To have the kapok wholly free from seeds, or any other impurity, well teased, and looser packed is all that is wanted. What is *not* wanted is what goes down at present, an imperfectly cleaned and slovenly prepared product, and which is rendered less valuable still, in that it arrives pretty nearly as hard as a concrete block and bound with hoop iron.

As I said at the beginning, Ceylon takes unkindly to a back seat in any matter, and as regards kapok—for which there is a good demand in Australia—there is no earthly reason why growers of it here should not get the top price going. The difference in freight would be very much more than met by getting the advance in price, and then the comfort of having an article that would sell.

The Ceylon Government Railway is about as irresponsible as it can possibly make itself, and its regulations and by-laws are the astonishment and envy of the managers of home lines. But the tide still runs in the direction of even greater security and if a motto were wanted for that branch of the Government, the historic one of "I 'll make siccar" might well be adopted. Railway receipts are seldom clean, and if you are despatching tea, let your boxes be what they may, there is some remark about them, testifying to the argus-eyed vigilance of our carrying Company. We are now pretty well accustomed to the "one plank loose" or "some nails coming out," or other matter of this kind and the whole thing ending in nothing. It always reminds me of a mate's receipt I once saw. Bar iron was being shipped, but while the number of bars were right enough, there was the saving clause of "very rusty" written across the document! The other day I got a receipt back from the railway; there were no planks loose this time nor nails coming out, but, two of the tea chests were "stained with cow dung"? Was there ever such perfection as that? This official deserves and I trust will be promoted. Just contrast his precision, with the loose way things are often done on board ship. Three elephants were once shipped at Calcutta, or at least were supposed to be shipped. All the receipt that could be got out of the ship however was for two, with the clause "one in dispute," added. I never heard if the other elephant was found.

The Sinhalese harvest just being reaped, is I hear, a short one in some districts—as much as a third behind last season it is said. If the villagers have not a sufficient rice harvest, if they but come to the tea estates, and work steadily, they will earn a harvest of rupees instead. What tea flushes we have been having, and how pushed all have been to keep up with them! A wonderful season certainly.

Coffee, too, in many places is looking very well; I was hunting the other day for a specimen of leaf-disease and could not find one. There is a fine crop, too, set and a promise of more. But there is the experience of the past of what a fair deceiver coffee is, and while it is legitimate enough to chronicle the present prosperous appearance of things, and rejoice therein, still there is so much between this and the harvest.

The unusual push on estates at this season has made the value of Ramasami rise again, and the recommendation of the Planters' Association in the matter of advances is pretty much disregarded. Those who have fairly and honourably tried to act on the suggestion have found their labour force falling off and have had to do the next best thing, join in the scramble.

This is very much to be regretted, but it was not wholly unforeseen. Every year makes the need of coolies more and more evident, and yet it is wonderful how we manage to scrape through. The Tamil nation met our wants when there was the big run on coffee, although there was many a fearful Jeremiah with his roll of the coming woe, who foresaw nothing but disaster, and I have no doubt that history will repeat itself, and with our increasing outturn of tea there will come an increasing influx of Tamil labourers to meet our wants. Any how it would make one uncomfortable to believe otherwise. PEPERCORN.

A SUBSTITUTE FOR COAL: THE FIRST LIQUID-FUEL EXPRESS LOCOMOTIVE IN THE WORLD.

[We are indebted to a correspondent who writes:—"I send you copy of the *Daily Graphic* with the account of a run on a Liquid-Fuel Express Train. As the matter bears on estate firing, I thought you would like to see same."—We give nearly all the report as of special interest to planters and others who may be longing for an economical fuel.—ED. *T. A.*]

A RUN ON A LIQUID FUEL EXPRESS.

(BY OUR SPECIAL COMMISSIONER.)

It was the box-seat that did it. Had we something corresponding to the box-seat on our fast engines, where for an extra fee, one could face the wind and the rain, the sunshine and the mist,

we would discover that trains are no less interesting and picturesque than ever the old lumbering dead and gone stage coaches were; for there is beauty in an engine—leaving on one side the smoking, puffing, evil-breathed metropolitan or suburban engines—the beauty of strength and speed. Had not Dickens and Hazlitt and other literary giants of that day told us in their best of the joys of the ride on the stage coach, and hid from us its many discomforts, we would have seen less of romance in it than we do now.

ENGINE 759.

At any rate, I found much to admire in Engine 759 as she ran up the line at Ipswich station, coming to a stand after her steam from Yarmouth. She is practically the only express engine fed by liquid fuel. There are other liquid fuel engines, many in Russia, a few in the United States, and in South America, but none are entitled to be called "express" engines, engines which do long runs at a high speed. Engine 759 is now some eighteen months old, and she is in the pink of condition. She differs from the ordinary engine in appearance by having on the tender, instead of some tons of coal, an iron tank, and in her cab one to the manner educated would have noticed a few more taps and handles and levers than usual.

A REFUSE OF VALUE.

I had travelled down with two officials of the Great Eastern Railway Locomotive Department at Stratford, and was told of one of those mechanical revolutions, of which this century has seen so many. The story is a curious one. The railway company have at Stratford gas works where they make from shale oil the gas which is burned in their trains. In the making of this gas refuse in the form of thin tar is given off, and this having been run into some stream at Stratford, the authorities came down on the company for river pollution. That it was possible to further pollute any stream at Stratford was a surprise to me. However, the company had to get rid of their refuse in some way, and it occurred to Mr. James Holden, the Locomotive Superintendent, that the best he could do with it was to burn it. He hit on a plan of burning it under the stationary boilers used for making the gas, and suddenly, from a mere refuse, this by-product had become valuable. Little led to much. Mr. Holden went on to invent a system by which the refuse could be used as fuel on locomotives, and at once effected a revolution in the fueling of engines.

SOLID AND LIQUID FUEL.

There were great difficulties to be got over. In this country it would be of little use designing a system which would render engines useless for solid fuel, or one such a nature that the parts are complicated and easily thrown out of action. It has, further, to be under the ready control of the driver. Another and chief difficulty is the blast. All these points have been fairly met. Dealing with the blast first, I must explain that when burning liquid fuel the blast required is much softer than when burning coal alone. A greater quantity of air must pass through the body of the fire when coal is used. Means were found to enlarge and reduce the blast pipe, and thus fit the engine for either coal or liquid fuel. Accompanying this is a sketch of the engine, with the front removed to show the blast pipe. The diameter there shown is 6in., and it is that diameter which is "on" when the liquid is being burned; but when coal alone is being used, the fireman touches a lever, the ring above comes down, and, being conical, reduces the blast pipe to 5in. diameter. When the large diameter is in use there is less wear and tear of fire-box and tubes, and less back pressure on the cylinders, and the engine in consequence works more freely. It will be seen that this arrangement of enlarging the blast pipe, which has been invented in connection with this system, is of high value.

HOW THE FIRE IS FED.

To explain thoroughly the ingenious arrangement of Mr. Holden's apparatus would require much technical detail. How it is done is simply this:—The liquid fuel is conducted from the tank through pipes to the "injectors." These (two in number) are placed below the footboard in front of openings provided in the fire-box. Coming from the boiler are steam pipes, all easily regulated by the bunch of handles shown in the sketch. The steam passes through these pipes to the injectors, there meeting the oil and driving the atomized fuel into the fire-box. But before combustion takes place the stream of pulverised liquid is met by still another gush of steam known as the ring jet, which induces a strong current of air, and the fuel is thrown into the fire as a fine spray, charged too with abundant oxygen for rapid combustion. Then there are other cunning contrivances —a lever which regulates or stops the flow of fuel to the furnace, a handle which, turned, sends a jet of steam through a coil in the tank to warm it in cold weather or liquefy it when it is thick, and various other matters, all tending to great economy in working and in fuel. As to the relative value of the system with that of solid fuel, that also is important. One pound of the fuel is equal to 2 lb. of coal, which means that, as with a pound of coal 8lb. of water can be evaporated, a pound of liquid fuel will evaporate 16lb. of water. The fuel costs 25s a ton; coal to do the same work (two tons) costs 35s—a big saving alone. Of ten engines of the same class, one using liquid fuel requires per engine-mile (which includes standing in sheds, sidings, &c.), 11lb. liquid and 12 lb. solid fuel. The others require 34lb. solid fuel per engine-mile. The weight on the tender is reduced by a couple of tons, and the saving all round is something like 50 per cent. The gentleman who has had this department of the Stratford Works in hand form the first, tells me that the fuel used to cost them ¾d a gallon. They are now paying 1d a gallon for it. They add to it a refuse oil obtained from the Beckton Gas Works, a creosote or green oil left over after tar distillation, which costs from 1½d to 2d a gallon, and brings up the cost of the fuel to about three halfpence per gallon.

THE START.

But all this time Engine 759 has been standing waiting the signal to be gone. Here is her official description:—Driving wheels, four coupled, 7ft. diameter; cylinders, 18in. by 24in., weight, in working order, 40 tons. Our times were:—Ipswich 4.22; Liverpool Street, 6 o'clock—nearly seventy miles to be done in an hour and twenty-eight minutes. A few yards away rose the tree-clothed hill, crowned with a pretty red-brick house, which serves to make Ipswich Station one of the most striking in the Eastern Counties. Even the tunnel, with which it has been pierced, hardly disfigured it, and on such a day—sunshiny, warm, and blue skied—after a spell of London fog it was enough to suggest the still far-off spring. I climbed into the cab of Engine 759, and saw the fuel pipes at rest. The fire was a dull glow, for it is one of the benefits arising from the use of liquid fuel that none of it is wasted when the engine is

at a standstill, and no steam generated only to be blown away in a shrieking howl from the safety valve. Driver Dennison was oiling the human machine which is his, as he turned to welcome us aboard. Bob, the fireman, was oiling Engine 759, and we had the engine to ourselves for a moment. Its weight saved it. But time was now up. The "board" fell, somewhere in the rear of the train the guard whistled, and with a sharp toot and then a long call from the whistle, we were on our way up the tunnel. Bob had pulled the fuel lever and touched the steam cocks, and as he threw in three or four shovelsful of coals, showed us the fire-box suddenly become a raging furnace of white flame. Yet as we came into the daylight the smoke stack gave no sign of smoke. A long line of steam trailed behind us, and it was pointed out that even when she was being coaled no smoke came from the engine funnel. Here is the smoke nuisance solved, so far as railways are concerned, thought I. We had now settled down for the run. We were going up hill—something like one in 110, I believe—and the load, seventeen coaches, was a heavy one. Another coach and we would have had to come on with a pilot, as is the case with this train all the summer months.

* * *

AT TOP SPEED.

A little steam was blowing off and we seemed to whistle under archways and station roofs in our speed. Away as far as I could see as I leaned out of the cab, were a number of platelayers, their day's work done, going home. They were on the up line, and when there was still a long distance between us and them the driver pulled the whistle cord. They stepped aside with pleasing promptness, and almost at once I caught a glimpse of their brown upturned faces as we powdered past. "We did that bit at over sixty," said my mentor. Only "Surfaceman" could sing the praises of such an exhilarating whirl of life inspiring haste as that! Yet one had time for contrasts. In the height of our fastest pace a country church with its white headstones, each with its wreaths and flowers of remembrance, was for a moment in sight. Who could have failed to think that for all our rattle and rush and roar, for all our "ever toiling up the climbing wave," there was the terminus? Still even there it may be pleasant to think we have been one of the first to do seventy miles in an hour and a-half on a liquid fuel express. We were nearing the end. A murky haze ahead and the lessening of the distance between the stations betokened an approach to London, whose lights were now beginning to show. Away down in the country there was an impression of stillness. The stations, the roads, the fields looked quiet. We were the only noisy object in sight. Even the woodman as we passed stopped his chopping to gaze at us in the still of the evening air.

ALMOST HOME.

Now people appeared thickly on the stations. The roads had become streets, and were brisk with traffic. We went by suburban trains laden with folk. London was around us. We had had a clear run. Only once did a signal stand out against us, and at once the fuel was shut off and the train began to slow. But it was only for a moment. Even in the crowded ways about the suburbs our course was indicated by green lights, and only outside Liverpool Street itself did the red show. We came to a full stop, shut off steam and fuel, and waited. The effect of shutting off the fuel was wonderful, reducing the fire at once to merely a bright glow. "She's down," said Bob, as the signal dropped and we glided into Liverpool Street ahead of time, with the black of the fire bars showing in the box—enginemen will appreciate that after an express run—and no steam being wasted at the valve. It only remains for me to add that the system has already begun to affect the coal supply. Mr. Holden's agents, Taite and Carlton, are fitting it up on South American engines, and there it means all difference between very cheap liquid fuel at their own doors and English coal imported at £3 per ton.—*Daily Graphic*, March 4th.

THE ANCIENT CINNAMON REGION.

At the meeting of the Royal Geographical Society on Monday last, an interesting paper was read by Dr. H. Schlichter, on "Ptolemy's Topography of Eastern Equatorial Africa." The object of the author was to show that Claudius Ptolemy, one of the most famous of ancient geographers, who flourished at Alexandria about 150 B.C., knew and mapped out the position not only of the coast of Africa as far, and even farther, south as Zanzibar, but also, with tolerable accuracy, indicated the position of the great lakes of Eastern Equatorial Africa. In how far Ptolemy's topography was correct need not now be inquired into; but, in the course of the discussion it was pointed out that Ptolemy placed the "cinnamon country" of the ancients (*Regio cinnamonifera*) to the south-east of the Victoria Nyanza, whereas the country known to the ancients as the myrrh and cinnamon region was placed by them along the south coast of the Gulf of Aden, and the littoral south of Cape Guardafui. In connection with this statement it may be pointed out that there is evidence for the assumption that the cinnamon known to the ancients was the Chinese cassia; while it is practically certain that long after Ceylon was visited by European trading-vessels no cinnamon was produced in that island. The question whether in classic times cinnamon, or cassia, really did grow in Eastern Africa has frequently occupied the attention of pharmacologists; but the balance of opinion appears to incline to the belief that the cassia of China, along with other products of the far East, were carried to the ports on the Read Sea and the north-east coast of Africa by Indian traders, and there taken possession of by the Phœnicians (and after the decay of Tyre by the Egyptians), who carried them further towards Alexandria and other Mediterranean ports, but were, of course, careful not to divulge the trade secret of the origin of the valuable spice. In modern times neither cinnamon nor cassia has been produced anywhere in Africa on a commercial scale.—*Chemist and Druggist.*

[And yet, cinnamon is almost the only product left to us to which we thought we could safely apply the term "indigenous": we have the wild cinnamon tree in our jungles. We shall want to hear what Dr. Trimen has to say in answer to Dr. Schlichter.—ED. *T. A.*]

OPALS of a finer quality than those of Mexico have been discovered near Moscow, in the State of Washington, U. S., close to the Idaho Railway. They were found by some labourers while digging a well in a wheat field, the mother rock being a basalt wacke. Opal is an amorphous hydrated silice, and is deposited from water. The finest specimens of the gem or precious opal come from Hungary, but those of Mexico are very fine. The fire opal of Zimapau, in Mexico, is transparent and of a deep red, being coloured by oxide of iron. Small veins of opal have been found in several parts of the United States.—*Globe.*

THE JAMAICA EXHIBITION: WHY NOT A COSMOPOLITAN EXHIBITION IN CEYLON?

PRODUCTS OF JAMAICA.

From a description of the Jamaica Court, some interesting extracts must be taken:—

In the centre of the Court as already stated shoots up a palm tree whose spreading branches arch overhead and add to the picturesque effect of the building. At the base of this tree are two tropical plants in tubs, one is the pepper plant the other is a fine specimen of the pine apple—*ananassa Sativa.* At the four corners of the Court are bananas in tubs, coffee plants in berry, palms, crotons, large barrels of raw coffee berries and a small barrel of cocoa berries. Barrels of sugar are placed at the other corners.

COFFEE.—The specimens of coffee are arranged on shelves, on the east side of the court on the exterior. They are the first objects one sees on entering the hall and looking to the west. The different coffee parishes are well represented. In the centre is a fine exhibit sent by Capt. G. G. Taylor, from his Moy Hall Estate in the Blue Mountains. This coffee is grown at an elevation above 4,000 feet and competent judges state that some of the samples here shown are equal to the finest coffee produced any where. In connection with this exhibit we may mention that Capt. Taylor exhibits in the same court a painting of his Coffee Plantation works, and also one of his Coffee Fields at Moy Hall. These are very characteristic views, giving one a true idea of what mountain scenery in Jamaica is. There are also fine samples from Whitefield Hall, Cold Spring (John McLean), and from the various parishes. From St. Catherine for instance there are samples from the estate of Mr. Thomas Kemp, Mr. Thorp, &c. From Manchester from Mr. Wyman, Mr. Elder and Mrs. Martin. St. Andrew from Messrs. Henderson, McClaverty and Thorp. Clarendon from Messrs. Young, Welsh, Waddell and Logan. St. Mary from Mr. Walker, and a specimen of Liberian coffee from Mr. Jenoure, Portland.

RICE &c.—In the corresponding division on the opposite side are exhibits of pimento, nutmegs, and cinnamon. There is also an interesting exhibit of rice from Dr. Calder's fields in Westmoreland, and one from Portland, sent by Mr. Thomas Briscoe.

COCOA AND KOLA.—On the eastern shelves is arranged a pretty exhibit of cocoa. The seeds are contained in bottles on either side and in the centre are a lot of fine pods, mixed with specimens of the prepared cocoa from different exhibitors. Specimens of Kola beans are also shown with the powder.

Tea seems to have been exhibited only by the Botanical Department. The negroes of Jamaica, although more advanced than those of Hayti, have not, it appears, yet abandoned their savage and degrading superstition of the Obeah; as the following paragraph shows:—

The article in the "Victoria Quarterly" on Obeahism by Inspector Thomas is one of the most scathing that has ever appeared in that generally very mild journal. Inspector Thomas has had exceptional opportunities for studying the superstition and what comes from his pen is sure to be trustworthy. The picture he draws of the degrading belief is a sad and disgraceful one, and it is in the hope that his article will assist in stamping it out that the Inspector has penned it. It will be published in pamphlet form and sold at the Exhibition, where the Inspector has also an exhibit of some of the articles taken from the practisers of the vile art.

The Christian Church as presented in its state-supported form could not, in days of slavery, ave been instrumental in superseding such superstitions by a purer faith, as witness the utterances of a candid clergyman regarding the now happily disestablished Church of England:—

Churchmen are not the only men who will wish to have the book. Nonconformist will buy it, read it, and learn from it. And they will be pleased to find that they have in the writer of the sketch of the history of the Church of England in Jamaica one who writes without fear, favour or affection out of place. The exclusive spirit that wounds, because it ignores the Christian work of other people, Mr. Ellis does not cherish. If he does, it is not in his book. There is the ring of honesty in what he says of this other work, and it occurs again and again, so that the acknowledgment is full. On the other hand Mr. Ellis touches frankly on the shortcomings and the blots on the early Church of England in Jamaica. He is as plainspoken on these, as on the good work done by the Nonconformist missionaries. In this way and following the thread of his narrative, the reader gets a very fair outline of the history of Christian progress in Jamaica, and he learns that that progress is real, and better still is assured.

Mr. Ellis gives his readers some curious glimpses of the clergy in the olden times. One of his mildest censures is the following:—"Nor, as we shall presently see, were the character and attainments of some of the clergy, licensed by Bishops of London, calculated to give the laity of Jamaica much confidence in the tact and judgment of the prelates who selected these clergy and licensed them for their sacred duties." In the early part of the 18th century the Jamaica Church was, he says, "regarded as little more than a respectable and ornamental adjunct of the State, the survival of a harmless home institution, which would cease to be tolerated if it showed any great signs of energy or activity. At best it represented the religion of the white settlers, and cannot claim in any real sense to have been a missionary church to the black labourers * * * few traces are to be found of any marked efforts on the part of the church to raise the moral tone of the slaves, to ameliorate their distressful position or to instruct them in the elements of religious truth." Referring to the circumstances that must have hemmed in any clergyman disposed to be active, Mr. Ellis observes, "As subsequent events prove, and as no doubt the planters anticipated, the inculcation of Christian truths should not fail to produce feeling of disaffection, and a consciousness of humiliation and ill-treatment in the minds of the African bondsmen. 'The truth shall make you free,' and those who were opposed to freedom were at any rate consistent in withholding the truth. It is easier to find fault than it is to make allowance, and if the Jamaica clergy of the eighteenth century deserve their share of blame, they are at least entitled to a large and charitable allowance in view of the difficult and unusual circumstances under which they laboured." A contemporary writer is quoted as saying of the clergy of that time that the majority of them were "of a character so vile that I do not care to mention it; for, except a few, they are generally the most finished of debauchees." Mr. Ellis then remarks, "The same writer adds that many of the churches were seldom opened, a fact which only a sham sentiment can regret. There is a sort of pleasure in giving these disreputable clergy credit for the possession of that amount of grace and of good feeling which was sufficient to prompt them to keep their shameless persons outside the doors of the houses of God."

Some startling information is given in reference to the administration of the Sacraments of the church. "As an instance," says Mr. Ellis, "of how little care the legislature took in the religious condition of the slaves at this time, we may mention that the fee, fixed by law, for administering the Sacrament of Holy Baptism to a slave was £1 3s 9d, a sum large enough to be prohibitory." Even in this century things were in a strange condition. In 1816 when Mr. Monk Lewis was on a visit to the island to look after his properties, the following incident occurred. "One day during this visit a slave wished one of his children to be baptised, and, as there was no clergyman within many miles, Mr. Lewis undertook to administer the Sacrament. The ceremony took place in the dining room, Mr. Lewis signing the child's forehead with the sign of the cross, and offering an *ex tempore* prayer. This was followed by the baptismal party giving three

cheers for Mr. Lewis, who concluded the ceremony by distributing Madeira among the congregation." In the same year the baptismal fee for a slave was fixed by statute at two shillings and six pence. Between 1821 and 1824 one clergyman baptized 12,000 slaves at half-a-crown a head.

Dr. Wolcot (Peter Pindar) was, for a time, one of the exemplary clergy referred to. Some of the *Observer* readers may be as ignorant as we were until we read the literature of the Jamaica Exhibition, that, amongst Queen Victoria's titles, in addition to Empress of India is "Supreme Lady of Jamaica." We notice that the working of the railway by the American company to which it was so unwisely sold by Government is described as most unsatisfactory. A fatal accident is reported in the paper before us. Amongst the distinguished personages present at the landing of Prince George was Major Knollys, C. M. G., Inspector-General of Police, who came to Ceylon as Sir Arthur Gordon's A. D. C. The report states that

The photo-artist of "Harper's Magazine", the "Illustrated American" and "Frank Leslie's Newspaper" was busy during the interval of waiting taking photographs with the camera.

If we quote a notice of the opening ceremony at the tail-end of this communication, it is due to the arrangement of the matter in the three sheets of the special edition of the *Gleaner*. From its report we learn that

The ceremony which took place in the Exhibition Building was certainly one of the prettiest from a spectacular point of view that has ever been performed in our island. For never before has such a handsome building graced our town and seldom has such a galaxy of distinguished men and women been gathered together on so interesting and important an occasion is this when our first International Exhibition was opened by His Royal Highness Prince George of Wales. Truly our Royal visitor received a welcome worthy of the grandson of the Queen—a welcome which every one could see was the source of deep gratification to him.

His Royal Highness then stood in the centre of the dais, the Governor on his right and Lady Blake on his left, the Vice-Admiral Watson being next to her. Lady Blake was attired in a dress made in an English School of Art and designed by a Baronets. It was trimmed with Orchids and leaves embossed on light Canary Satin with Chaneille trimming, each end of which alternated with balls of Canary and Heliotrope. Her Bonnet, was of light canary velvet with Heliotrope Orchids and aigrette.

From the address by the Commissioners to Prince George, we take a few paragraphs :—

The original suggestion from which this Exhibition took its rise was, by collecting and displaying samples of the Agricultural Industrial and Commercial products of the Island, to arouse and foster a spirit of enterprise and emulation among the inhabitants of Jamaica, and at the same time to disseminate among the people of other countries a more extensive knowledge of the resources and capabilities of the colony.

The spontaneous and liberal manner in which funds for carrying out the enterprise were guaranteed by the people of the colony and those interested in its welfare and the ready response with which the invitation to take part in the Exhibition was met by the Mother Country, and the sister colonies—notably by Canada—and by many Foreign states led to the enlargement of the original scheme and has resulted in an Exhibition on a larger scale, and of a more general and comprehensive character than that at first contemplated by its originators.

Every effort has been made to render the Jamaican Exhibits a complete and representative collection of the agricultural, mineral and industrial products of the Island and we would venture respectfully to express a hope that, as such, they will be found by Your Royal Highness to possess features of novelty and interest.

The Prince made a suitable reply ; and after a prayer by the Bishop, during which a canary poured out its song, and after Sir Henry Blake had presented a golden key to the Prince as a fitting emblem of a golden future for Jamaica, Prince George declared the Exhibition open. The address from the city was enclosed in a casket made from 120 ounces of silver. When we left Britain for Ceylon in August 1837, there were not more than 200 miles of railway completed, and the first experiments in telegraph were being conducted by Wheatstone. Deeply interesting is the progress of telegraphy in the interval, as narrated in connection with exhibits of the appliances of the art :—

Of Historical Telegraph Apparatus there are Cooke and Wheatstone's 4 needle Telegraph 1838, Cooke and Wheatstone's Double Needle Telegraph 1844, First Train Signalling Instrument 1840 used on the Blackwall Railway between Limehouse and Stepney. Specimen first Telegraph Line 1837 between Euston and Camden Town. Double needle small pattern, Highton's single needle Telegraph 1848 Wheatstone's Type Printer 1841. Varley's Horizontal Relay 1856. Wheekey 1855 ; set of wire joints 1842. to 1851 Switch or commutator 1857. Preece's Semapore 1860. Bain's Chemical Telegraph 1850. More Embosser 1853, Universal Switch 1860. Specimen of first submarine cable Dover and Calais 1850.

Mr. Wilson informed us that this cable was of solid copper wire insulated with Gutta Percha there being no outer protection whatever, the consequences were that the Gutta Percha almostly immediately chafed through and the undertaking failed. To make the cable sink to the bottom weights were attached during the laying at about every 100 yards.

In 1851 another effort was made to carry the Telegraph Line across the Channel, which was successful. This cable is now working, that is to say portions of it, for in the many repairs it has been subject to fresh cable has been put in, to replace the old.

Mr. Wilson also informed us there is today over 100,0.0 miles of Submarine Telegraph Cables in operation. The general portion is owned by English companies, and all are manufactured and laid by English firms.

Mr. Wilson said, to give some idea of the employment of labour throughout the world brought about by the varied applications of electricity the following is about the number of persons employed. Land Telegraphs, 180,000 persons. Telephone Companies 30,000 persons. Electric Lightning Companies 100,000 persons. Submarine Cable Manufacture (Mainly British) 5,000 persons. Submarine Cable Company (Mainly British) 6,000.

Mr. Wilson informed us that at the present day the Telegraph systems throughout the world possess about 1,800,000 miles of wire. Russia claims 154,000, France 170,000, Germany 180,000, the United Kingdom 240,000. India and Colonies 200,000 and the United States 600,000. Traffic carried over such Lines—United States 70,000,000 messages per annum, United Kingdom 45,000,000, Colonies and India 12,000,000, France and her Colonies 32,000,000, Germany 18,000,000.

Mr. Wilson told us all Englishmen should be proud that the first specification of patent taken out in any country for telegraph apparatus was granted to Cooke and Wheatstone in 1837.

It was not till 1845 that public interest was really attracted towards the Telegraph—Fame and success are frequently due to a mere accident and this was the case with the Telegraph. A murder was committed at Slough and the murderer escaped by the first train to London. The telegraph was set to work and the carriage occupied by Fawoll—that was the man's name—was arrested much to his surprise he not having taken into calculation the new element which had been used against him.

We fear we have extracted too freely, but we think the interest of the matter will more than atone for its

length, especially to readers who favour the idea that Ceylon, no less than Jamaica, ought to have an Exhibition of her own: not merely a collection of local exhibits, but a cosmopolitan and comparative show to which all the countries in the world should be invited to contribute. If such an Exhibition is deemed feasible, and if it is to precede the great World Show at Chicago, there is clearly no time to be lost in making the necessary preparations and arrangements. Money will be required, and may we suggest that to no better or more reproductive object could the proceeds of the pearl fishery now in progress be devoted? The responsibility of cordially accepting or coldly rejecting the idea rests with Sir Arthur Havelock.

BURNT EARTH.

This material is very useful to the cultivator who has a cold or stiff soil to deal with, as it promotes the drainage, and is especially useful where liquid manure is applied, the noxious substances inimical to plant life being eliminated, and the soil made much warmer and richer in potash, lime, phosphoric acid, carbon, &c., ingredients which increase greatly the fertility of the land. Burnt earth dressing will prevent the cracking of the surface during dry weather by rendering it less adhesive, and therefore not so liable to cake. We use a large quantity of it here for mixing in the Vine and Peach borders, for Roses, &c., under glass, and outside for herbaceous plants, and it is found to be useful for all of these; in fact, I have not the least doubt that it would prove beneficial to all kinds of plants here, and also wherever the soil is stiff and cold. If used in the proportion of one part burnt earth to six parts soil, and well mixed, it makes a great difference at once in the working of the latter, and is, in fact, the best thing that can be applied for the pupose; other materials that are often used for keeping soils open, such as sand, coal-ashes, lime rubbish, &c., do not give such good results, because they tend to impoverish instead of enriching the soil. A good instance of its utility is to be seen here at the present time; the borders are being renewed in our large Peach-house, because they were not properly made when the house was built, and some four years ago I had a quantity of burnt earth worked in amongst the roots of the trees on the coldest side of the house. These trees now lift with a nice lot of fibrous roots; the soil comes away cleanly, and in good condition. The soil of the opposite border, which has not been treated in the same manner, has become sour in many places, and the tree-roots have not many fibrous roots.

I have not had the opportunity of trying its effects on light soils, but imagine that it would benefit them also if used in a smaller quantity; it would certainly improve any that might be overcharged with nitrogen through excessive manuring, &c., and during dry weather it acts as a reservoir for moisture when placed beneath the surface.

The best time of year for preparing it is during a spell of warm, dry weather, everything burning freely when dry, and earth being no exception to the rule; but it is possible to burn it under any circumstances by using a larger quantity of fuel.

In this, as in all other operations, very much depends upon getting a good start. We generally get some large tree-roots, or "butts," which have been sawn off, or some large logs cut into lengths of 3 to 4 feet, and a small quantity of sticks and straw to get a good body of fire as quickly as possible. The small stuff soon burns out, but when the larger pieces get well alight, some bush prunings, &c., are thrown on it in order to keep the soil from settling down too close to the large logs, and as soon as the fire burns partly through this covering, some soil may be put on. This should be done gradually at first, so as not to overload the fire; but when all the heap has had one good covering of soil, and the fire is seen to be making its way through it, some coal-dust should be scattered all over, and another lot of soil put on; after this is burnt through, the heap should be ready to "draw" by opening out the middle, so as to spread the fire, and get a good base of ashes. This is best done by what is called a "muck drag" in this part—an iron tool with two or three prongs about 9 inches long, shaped like a Canterbury hoe; after the fire is well open out, another old log should be put in the centre to keep a body of fire going on, some more garden refuse placed over this, and then more soil added.

The heap by this time should be a large one, and in dry weather will burn almost anything with little further assistance; but if the soil is wet and the weather rainy, some coal dust or old pieces of timber should be added occasionally so as to keep the fire well alight. The best soil for burning is a rather light loam from a pasture, cut in turves about 4 inches thick, but this is not easily obtained by many persons, and the best that can be had must therefore suffice; clayey soils will not do, as they burn too lumpy and require screening afterwards, and very sandy soils would most likely run down too fine to be of much benefit; old fruit borders that have got sour or worn out will answer well for burning, and refuse from the potting benches, if free from crocks, prunings of fruit trees, &c., make first-rate ashes if burned up in this manner, but this is properly speaking charred refuse, and does not come under the heading of burnt earth.—W. H. DIVERS, Ketton Hall, Stamford.—*Gardeners' Chronicle.*

COCONUTS AND CINNAMON.

VEYANGODA, 28th February.

With very nearly 4¼ inches of rain February, one of our driest months, all anxiety with regard to the effects of the drought is at an end. Under ordinary circumstances, the drought will practically be at an end in March, for in April we have the fitful showers which are associated with that month. A heavy fall of 2·53 inches on the night of the 12th instant was particularly welcome to all forms of vegetation, and to cattle. The latter have not, as is usual at this time of the year, suffered from want of pasturage.

The prospects of coconuts are bright for the year. The effects of three consecutive years of liberal rainfall are now apparent in good crops. Prices both for the raw nuts and for copra are good. The former is kept up by the demands of the local Desiccating Factory, where prices ranging from R34·50 to R35·50 are paid according to quality of nuts. There seems to be no end to the extension of the works here. Buildings seem to be cropping up all over the grounds to supply the orders that pour in from all quarters of the globe.

The cinnamon season 1890-91, that will end in March, will be long remembered as one of the most unfavourable on record. Both the S. W. and N. E. seasons were unfavourable for continuous peeling. Harvesting was carried on by fits and starts, whenever rain fell. With any other product, one would have been safe to predict a diminution of crop as a result of unfavorable seasons. This is impossible with cinnamon, the output of which mysteriously increases when circumstances point to a decrease. It is safe, however, to say that the vast majority of cultivated Estates in the principal Cinnamon districts of the Western Province have secured little more than an half of their annual crops. With the rain we had this month many Estates have resumed peeling. The possibilities of continuing the work are dependent on the weather, which, if appearances are to be relied on, will prove favourable. Last night we had all the indications of an imminent shower in low rumbling thunder and flashes of lightning, which seemed nearer and nearer as the night wore on. They ended in nothing, however, here, but may I think be safely regarded as a precursor of what we may expect in a day or two. With a diminished crop, the contemplation of lower prices at the last sales is not over pleasant to proprietors. The hopes ex-

pressed of a rise in prices "next time" are the usual buoys that keep those engaged in agricultural pursuits from despondency.

The necessity of supplying certain demands often threatens an industry. The suicidal inclination to meet them is fostered by high prices. The encouraging prices paid for fine Tea stimulate fine picking, in spite of its having been shewn by a competent chemist that it is a great strain on the bushes. Not only the prices realised, but the reputation an Estate and its Manager acquire, promotes a pernicious practice. The reference to Tea is only to exemplify what is being done with another product with which I am more immediately concerned. Those who are in a position to compare cinnamon estates as they were 20, or even 15, years ago with their present condition, cannot fail to be impressed with the evils of fine cutting. It is not to be supposed, however, that the difference in appearance is mainly due to the difference in the height of the bushes. No, the growth is decidedly weaker now than then. The bushes are less healthy. Those whose accounts of crop cover the period I have named will, I am sure, find, on reference to them, that the difference in quantity will range from 20 to 40 % between then and now. The mischief is that the decline has been so gradual as to be hardly perceptible. For 2 or 3 years the yield is kept at the old average by forced cuttings. Then the inevitable, that crop has decreased, is faced, and a lower figure is accepted as the annual yield. It is attempted to keep up to this lower figure by a system of forced cuttings for a few years, with a like experience—a lowering of the estimate of yield in a few years—till now, as I said before, the difference in yield, though imperceptibly, has declined materially. The growth of wood, as before stated, is not as healthy now as it was before. The sticks are stunted. This, however, is not to be wondered at, and is the natural result of shoots from immature stools. Where I wonder is this system of fine cutting to end? I see no end to it, however, as long as the demand for fine cinnamon lasts. The manufacture of cinnamon is becoming a fine art. The older generation of peelers is quite out of it, and the "quilling" is entirely in the hands of young men and boys. The improvement in the make of the quills will be best understood when one circumstance is mentioned. About a dozen years ago, and after the craze for manufacturing fine quills had set in, a Manager of a crack Estate drew special attention to a parcel of exceptionally fine cinnamon of "superiors" which averaged 19 quills to the lb. Now 40 quills to the lb of the same quality of cinnamon is thought to be nothing unusual! I warn proprietors, however, to look carefully into the question of fine cutting, and to decide whether it is to their interest to persist in it.—Local "Examiner."

TEA AND COFFEE SUBSTITUTES.

(*Continued from page 732.*)

COMPOSITÆ.

44. *Helichrysum quinquinerve*, Lessing.—A sample of the dried leaves of this plant were shown in the Cape of Good Hope Court of the Colonial Exhibition, 1886, as Bushman tea, and said to be used as a substitute for China tea.

45. *Tarchonanthus camphoratus*, Linn.—A shrub, 6 to 8 feet high, native of the Cape of Good Hope, were it is known as Dagga. When fresh, the leaves have a peculiar camphor-like smell, hence the specific name; they are infused in the form of tea, and are supposed to have medicinal effects. They are also chewed by the Mahomedans, and smoked by the Hottentots. There is a sample of the leaves of this plant in the Kew Museum.

VACCINIACEÆ.

46. *Vaccinium Arctostaphylos*, Linn.—Under the names of Thé de Bel Dagh, Trebizond tea, and Broussa tea, the dried leaves of this plant have been variously known. It was noticed in the *Pharmaceutical Journal* for January 17, 1885, pp. 573-4, and March 21, 1885, pp. 771-2. In 1817, Mr. George Maw brought for the Kew Museum from Asia Minor a small sample of a native tea obtained at Broussa in Anatolia, where it was sold for about 8*d.* per pound. In a report by Her Majesty's Consul "On the Town and Port of Samsoon, and on the Circassian Colony in the District," contained in the *Commercial Reports from Her Majesty's Consuls*, 1884, part 1, p. 147, reference is made to the production of a native tea which considerably interfered with the import of China tea into the country. The Vaccinium tea is in appearance very like coarsely-prepared black Indian or China tea, and has a similar aroma—so much so, indeed, that the Customs authorities demanded duty upon the samples sent to Kew by Her Majesty's Consul; the taste of the infusion, however, has no resemblance to true tea. Upon submitting samples of the Trebizond tea for the opinion of a well-known firm of tea brokers, they remarked that common China tea showed a better value in every respect, so that the admixture of the Trebizond tea could hardly reduce the cost, while it would certainly not improve the flavour.

The following further notes on this subject are gathered from a memorandum by H. M. Vice-Consul at Samsoon. The tea in question became a commercial article so recently as 1880. At first its consumption was limited to the country, and particularly to those districts in which Circassian colonies had been founded. It is manufactured by Circassian planters in the neighbourhood of Amassia, Tokat, and Horek, all in the province of Roum, at a short distance from the forest, which clothes the mountain chain called Beldagh, and on which the plant which furnishes the tea in question grows in great abundance. The manufacture is carried on in the houses of the Circassian colonists who undertake this industry, and who appear to be pretty numerous. There are several gatherings of the tea; that which yields the best quality takes place in May. About 5,000 ocques (an ocque equals $2\frac{3}{4}$ lb.) are manufactured annually, but this quantity could be considerably augmented if there were occasion for it. The tea is sold on the spot at about 5 piastres per ocque. The cost of transport to Samsoon might amount to about 1 piastre, which brings the price per ocque to 6 piastres in that town.

The consumption is almost limited to the requirements of the vilayets of Sivaz (Roum) and Angora (Anatolia). It is to the town bearing the last-mentioned name that the greater part of the crop is sent. In 1881 a consignment was sent to France, but the transaction was not a profitable one. Some further consignments to Constantinople also do not appear to have been successful.

47. *Vaccinium hispidulum*, L.—A sample of the twigs of this plant is shown in the Kew Museum, under the name of Anise tea, from St. Pierre and Miquelon.

48. *Agapetes saligna*, Hook. f.—Described as a large epiphytic shrub of the Sikkim hills, at an elevation of from 1,000 to 5,000 feet. The leaves are said by Hooker to be used as a substitute for tea.

ERICACEÆ.

49. *Ledum palustre*, L.—An erect, small-leaved bushy shrub. Native of Canada and Labrador, where the leaves are used as tea under the name of Labrador tea.

50. *Ledum latifolium*, L.—The Cree Indians in the Hudson's Bay territory use the flowering tops of this plant as tea; they are gathered when in full flower, and dried, when they have an odour between that of Tansy and Camomile. The leaves are esteemed pectoral and tonic, and are said to have been used as a substitute for tea during the war of Independence. It is called Karkar-pukwa, or Country tea.

51. *Kalmia angustifolia*, L.—The twigs, with the leaves and flowers, are known by the Cree Indians in the Hudson's Bay territory as Bitter tea; the infusion is used more as a medicine than as a beverage.

52. *Gaultheria procumbens*, L.—A small, creeping, shrubby plant, native of shady woods in mountainous districts in Southern Canada and the Northern United States; it is known as Mountain Tea, Jersey Tea,

or Tea-berry. The leaves have a pleasant aromatic flavour, and an infusion is used in some parts of North America as a substitute for China tea, under the name of Mountain or Salvador tea.

STYRACEÆ.

53. *Symplocos Alstonia*, L'Her.—A small tree of New Granada, described as having the habit of the tea plant. The leaves, which are of a pale green colour, are employed as tea on account of their slight astringency. It is known as tea of Santa Fé.

LOGANIACEÆ.

53A. *Gærtnera vaginata*, Lam.—The seeds of this plant were introduced to notice under the name of Mussænda borbonica, but were identified at Kew in 1889 as those of Gærtnera vaginata. The interest at first attached to the seeds was on account of their use as a substitute for coffee. It was made the subject of an article in the *Kew Bulletin* for December, 1889, from which the following notes are taken:—The plant is a native of Réunion, and in a letter from the Consul to the Foreign Office, it is described as a shrub found in the forests, but not plantiful, bearing fruit only at the extreme ends of the branches. "The berry, when gathered, is peeled, and then much resembles the coffee berry, though smaller. In fragrance, it is inferior to coffee, and in colour to chicory. The yield is far less than that of the coffee tree, and the picking more expensive, that is to say, about 1s. the pound. It is much doubted, by reason of its inferiority, that Mussænda could ever compete with coffee and chicory, even if it were cultivated." From an examination made by Professor Dunstan, of the Pharmaceutical Society, it was proved that the seeds contain no caffeine, and that in consequence it cannot be regarded as a proper substitute for coffee. The result of Professor Dunstan's examination is printed in the *Pharmaceutical Journal* for November 16, 1889, p. 381. A sample of the seeds is contained in the Kew Museum.

BORAGINEÆ.

54. *Lithospermum officinale*, L.—The Gromwell of our hedges and copses is found also in other parts of Europe, and in the Basse Pyrenees; the plant is used as a substitute for tea, under the name of Thé de Montagne. A sample of this tea is contained in the Kew Museum.

SCROPHULARINEÆ.

55. *Veronica officinalis*, L.—A native of this country and of other parts of Europe, as well as in North America. The leaves, which are astringent and bitter, are made into tea in Sweden and some parts of Germany, and used medicinally as a stimulant under the name of Thé d'Europe. Simon Paulli contended that this tea was identical with the true tea of China. A sample is contained in the Kew Museum.

56. *V. Allioni*, Villars.—A glabrous procumbent plant, native of Switzerland, Southern France, Italy, &c. A sample of the dried leaves in the Kew Museum is labelled "Thé de Mont Cenis, used as a beverage on Mont Cenis."

57. *Capraria biflora*, L.—It is known as the West Indian Tea plant, Lunan says, according to Long and Barham, the leaves not only resemble those of tea, but make an equally agreeable decoction, which is also recommended as an excellent febrifuge. The plant is very common everywhere in the Savannahs.

Barham, writing of the plant says: "A Frenchman, captain of a ship, affirmed to me as we were walking about the town of St. Jago de la Vega, and observing this plant growing so plentifully, that it was the same as the tea plant of China that he had used in the part of the world many years, had seen large fields of it, and the manner of cultivating it, and all the difference was that the Chinese plant was larger, which he ascribed to such care and cutting of it, and had no doubt but the Jamaica plant if it were set in rich ground and attended with equal care would improve in size." Barham further mentions the fact of "a gentleman who never drank any other than West Indian tea, and that although he could not coil up the leaves so dexterously as they do in China, yet he performed this operation tolerably well, and every person whom he regaled with it extolled it as the very best green tea they ever drank in their lives. It is certainly unknown to what perfection it might be brought if reclaimed from its wild state, and cultivated in the rich soil of gardens, and it well deserves the experiments of the curious." The plant is a shrub widely distributed in the West Indian Islands, extending into Mexico, Brazil, Peru, as well as in Tropical Africa.—JOHN R. JACKSON, Museum, Kew.—*Gardeners' Chronicle.*

EEL WORMS AND ROOT GALLS.—The *Agricultural Gazette* of New South Wales for August, 1890, contains an elaborate account by Mr. N. A. Cobb of the eel worm (Tylenchus arenarius) which is causing great mischief to root-crops in New South Wales. A synopsis of the known species is given. When established, cure is impracticable; but prevention may do something by ridding the soil of the worms, or by putting such obstacle in their way as to render their ravages bearable. This may be done by the use of some chemical—preferably a fertiliser—which will destroy the larvæ before they have entered the roots; by the selection of some varieties not subject to the attacks of the creature; by trapping the worms and destroying them. To trap and destroy enemies numbered by the million, and hidden away under ground, might seem impracticable; nevertheless, a plan based on the life history of the creature has been successfully adopted in the case of Beetroot. Strubell, who obtained a prize from the University of Leipsig for an investigation into the nature of the disease affecting the Beetroot, observed that the larvæ, after entering the roots, did not become mature till after an interval or five or six week. Whereupon Professor Kuhn recommended that the plant should be pulled at the end of four weeks, when the creatures would die, and leaves no progeny in the shape of eggs. By thus sacrificing two or three crops of seedling plants, the pest is so diminished that a crop of roots can be successfully raised. Gas lime applied to the soil would probably be efficacious. These pests are becoming more frequent, or are sooner observed than heretofore, not only in outdoor crops, but in the case of pot plants. —*Gardeners' Chronicle.*

A FEW OLD SIMPLES.—To allay hæmorrhage, a toad, well dried in the sun and put into a bag, was hung round the neck by a string sufficiently low to touch the region of the heart; and a preparation of garlic and honey smeared on the person was said to act as a charm against the bites of dogs and reptiles, or the sting of numerous insects, likewise effecting, their cure. Toothache could be charmed away by a few leaves of the "shepherd's purse," placed in the sole of the shoe on the reverse side of the body to that in which the tooth was aching. An excellent recipe for weak or sore eyes was the expressed juice of the calyx of the red honeysuckle; provided always that the flowers were gathered kneeling, repeating nine paternosters in honour of the Trinity, nine more "to greet Our Ladye," and a creed. Rest and sleep were required after application. Another prescription for the eyes much in favour with the Anglo-Saxons was a paste made of the strawberry-plant and pepper, diluted with sweet wine. Children were passed through the split stem of a tree for the cure of the rickets, but the fracture must be afterwards bound up sufficiently tightly to ensure cohesion. For ague a very well-salted herring, split open, was applied, as hot as possible, to the soles of the feet. It might also be mitigated by the habitual wearing round the neck of an emerald—a gem equally potent in epilepsy. Precious stones were accredited with marvellous powers over the moral qualities and affections, as well as physical disease—hence the origin of their being set in rings and worn. The teeth of old age were fixed firmly in the gums by an infusion of powdered jet; while water in which the beryl had been steeped afforded a valuable wash for strengthening the eyes, besides ensuring the mutual love of a wedded couple.—*Hospital.*

CEYLON TEA AND THE NEW FRENCH TARIFF.

Mr. Mundella, the President of the Board of Trade, may justifiably be credited with the desire to see that all sections of British industry receive careful safeguarding when the terms of the proposed new French tariff have to be discussed between the respective Governments of Great Britain and France. It is questionable, however, whether any possible reduction of the present duty on teas imported into France would be beneficial in inducing its people to make such a change in their habits and tastes as to take to the use of tea instead of the present national beverage of coffee. We believe the existing rate of duty to amount at present to a little over one franc, or tenpence, the pound, and though comparatively high, this can scarcely be said to be a prohibitory tax. Of course tenpence strongly contrasts with the British rate at the figure (fourpence) to which the English duty has lately been reduced.

No doubt it would be a great thing for all growers of tea if the consumption in France and on the Continent of Europe generally, could be increased; but, as we have said, the item of duty upon the article is not the most important matter. A recent London Letter told us that a family in the South of France had been paying no less than seven shillings the pound for all the tea consumed by the household. Of such a price, the item of duty makes up but a small proportion. The question therefore must naturally presents itself whether so excessive a rate of cost may not be due to want of commercial activity in introducing the article. At the rate at which Ceylon tea could be imported into France—notwithstanding the existing high rate of duty—the retailer who vends tea at seven shillings the pound must be demanding a profit of something like three hundred per cent! If competition cannot be induced so as to greatly lower such a tax upon would-be tea drinkers, it is easy to see that there can be but little chance of the consumption of tea extending in France. It might, it seems to us, have a different result if really good tea was sold, as it might well be and with a satisfactory profit to the vendor, at something between three shillings and four shillings the pound. But even at such a rate there must yet remain a disadvantageous comparison between the cost of the coffee so freely imported into France and that of the tea which we desire to see largely supplant the former article.

So far as we are aware, the effort to introduce Indian tea to the Parisians has not as yet been marked by any great success. When that effort was first made, the hope was entertained that its effects would radiate from the capital as a centre throughout the provinces of the Republic; but this is scarcely likely to follow unless some further effort is made to reduce the prices at which tea seems still to be retailed in the localities the more removed from Paris itself. We could scarcely recommend such localities as a field at present open for direct attack by our own tea agencies. Our efforts are now quite sufficiently widely directed to occupy our attention for a good many years to come. But in spite of that fact, it may be as well that our distributors should bear in mind the disadvantages which are tending to restrain the French people from acquiring a taste for tea drinking. That restraint will be strengthened should the existing duty be, under the new proposed tariff, increased appreciably, and to the prevention of this we trust the interview had by our London Association with the President of the Board of Trade may materially contribute.

THE CEYLON LABOUR SUPPLY FROM SOUTHERN INDIA.

Like nearly all other large employers, Mr. H. L. Forbes, the Managing Director of the Scottish Ceylon Tea Company, felt during his recent visit to the island, that the labour supply was the most ticklish question in connection with the future of the Tea industry in Ceylon. We impressed on him in leaving, the advantage of learning all he could from a fellow-voyager, Mr. C. H. Greswell, a gentleman who, while knowing the Ceylon planting districts, had spent the last ten years in the centre of the labour supply districts in Southern India, as Resident Enginner on the South of India Railway. Both gentlemen travelled home by the P. & O. S. S. "Khedive" and the result is that we have the following interesting information from Aden, which we have no doubt will receive due attention from the Committee of the Planters' Association. In the first place Mr. Forbes writes:—

S. S. "Khedive," Gulf of Aden, March 26th.—We have had a fine run so far and hope to be at Aden tomorrow. It has been fairly cool till today which is very muggy and hot. With Mr. Greswell I have had several chats about labour supply, and enclosed is the result. All danger, apparently, of distress in Southern India has been wiped away by late rains. Undoubtedly what we looked upon as our own supply of labor has now also to serve other countries: the Cape largely. This is a very serious question and one which the P. A. should take up without loss of time; as if the migration to Burma, the Cape, etc. is to increase, our already too meagre supply will further naturally decrease. We must not allow other countries to become more liked than our own.

Mr. Greswell's letter is as follows:—

S. S. "Khedive," March 25th.

To the Editor "Tropical Agriculturist."

DEAR SIR,—Mr. Forbes has asked me for a few lines to enclose in his letter to you on the important question of the Labour Supply for the Ceylon tea estates. On leaving India I was not aware that any difficulty had been experienced by owners and managers of estates in obtaining coolies in sufficient numbers from the out districts in S. India. At one time owing to the partial failure of the N.-E. monsoon distress was predicted and Collectors of Districts were ordered by the Madras Government to submit special reports on the then existing state of affairs. These on the whole were favourable, and the rain which fell early in February removed all cause for anxiety. I am not in a position to explain wh the Ceylon planters should find it difficult to obtain labour now that confidence has been restored in the island and coolies are again paid regularly. Undoubtedly a great many emigrate to Burma and S. Africa and these countries afford a splendid opening for the industrious Tamil where in a few years he makes a small fortune. As an instance of this I may mention that only a few weeks ago I saw a batch of coolies alight at the Mayaveram station in the Tanjore District, and one of these had a large cash chest with him containing he said no less than 6,000 rupees. I asked him how he had managed to amass so much money. He replied that about 5 years ago he went to South Africa where the Government had given him a grant of land for supplying the men engaged in the Diamond Fields with vegetables and poultry; and he added he was now proceeding to his native village to buy land. According to the census returns the population of the Trichinopoly District has increased 95,000 during the last 10 years. The returns from S. Arcot, Tanjore, Madura and Tinnevelly Districts have yet to be published; but assuming their increase is in the same ratio, the question one naturally asks is what becomes of this (what may be termed) surplus population? As far as I have been able to observe the area of land now under cultivation between Villupuram and Negapatam, a distance of 166 miles much the same as it was eight years ago and yet,

it is not always easy to procure cooly labour, in fact during January and February last on account of the harvest all works in connection with the S I. Railway were more or less at a standstill for want of labour; and during the early part of last month when heavy rain fell the ryots were paying as much as 1s a day to their coolies for harvesting the ground-nuts which were beginning to sprout and had to be gathered in with as little delay as possible. On the other hand during the slack season which extends from March to July there is an abundant supply of labour, and it is then that a push is made with all Government and Railway Works. In July when the rains come down in flood, cultivation is resumed and the coolies return to the fields. If I had known before leaving India that the labour question was such an important one I would have inquired more fully into it and furnished you with details relating to the emigration of Tamils to other countries; as it is, I fear you will find the above remarks of little interest. On my return from leave to S. India, I will however indeavour to ascertain the cause of the falling-off in the labour supply to Ceylon from the districts I have already referred to.—Yours faithfully,

C. H. GRESWELL,

Resident Engineer, South India Railway.

We are much obliged to Mr. Gresswell and shall be glad to have his further reports by-and-bye. Clearly, however, there is to be no surplus of Tamil labour this year.

DR. TRIMEN'S TRIP TO THE STRAITS AND JAVA.

The M. M. S. S. "Natal" brought back Dr. and Miss Trimen after a pleasant trip extending over six weeks to the Straits Settlements and Java. Dr. Trimen has not fallen in love with the climate of Singapore which he considers hotter and more trying than that of Colombo. He was met by old friends in Sir J. F. Dickson and Mr. Trotter (Auditor-General) and very kindly received at Queen's House by Sir Clementi and Lady Smith. He also made excursions to Johore—where he met Mr. Turing Mackenzie, not over-satisfied with the progress of planting, and Mr. John Milne—and to Malacca, where he met a brother of our Auditor-General, Mr. O'Brien who is now Postmaster-General at the Straits. He also met Sir F. Weld, who looks the courtly old English squire and who, we regret to say, had returned from Pahang—which he came out to explore on behalf of an English Company, with an attack of "liver" which had quite laid him aside in Singapore when the "Natal" left. Sir F. Weld in his day has been one of the greatest of Australian and New Zealand explorers and bushmen, but he is too old now to presume on such work especially in tropical jungle.

The more important part of Dr. Trimen's trip was of course to Java. Here our Director of Botanic Gardens found a great contrast in many respects to Ceylon—the rich volcanic soil, the rather slovenly style of cultivation on plantations, the very happy contented appearance of the Javanese, the permanent location and easy-going ways of the Dutch, and above all the splendidly-equipped Buitenzorg Government Gardens, where the scientific staff includes no less than twelve Europeans, all graduates and "Doctors" and all busy in their several departments. The division of the 24 hours into two days and two nights is rigidly carried out almost everywhere in Java, so that when Dr. Trimen called at the Gardens after luncheon about 2 p. m., no one of the staff could be found! The siesta between 1 and 4 is a universal custom, while, to compensate, excursions are common after dinner up to midnight or 1 a. m., gardens and bands of music being then utilised as in English Colonies from 5 to 7 p. m. Anything will grow at Buitenzorg with the minimum of trouble, owing to the rich soil and moist climate; the Gardens are on a very extensive, luxuriant scale, though perhaps less attractive than our our own at Peradeniya.

Dr. Trimen was not impressed with what he saw of tea in Java; up to 3,500 feet above sea-level the tea gardens seemed of poor jât and careless management as compared with Ceylon. He was not able to get away to the great cinchona-growing region, but he found this article generally as little esteemed in Java as with ourselves of late years. The boom in Java at present seems to be in Liberian coffee which is being freely planted, and will apparently supersede the Arabian variety. Dr. Trimen saw little or no disease on it and the growth and crop are reported as satisfactory. He was told by English merchants in Batavia that proper preparation (a good drying of the beans) does away with the slight bitterness complained of, and now they get as good prices as for the best of the ordinary coffee. This was confirmed at Singapore: the Liberian variety is also as greatly in favour in Johore, &c.

When at Singapore, Dr. Trimen took the opportunity of seeing gambier prepared by the Chinese; he was able to follow the operations though a little puzzled as to how the final coagulation took place. Dr. Trimen has brought back some cubeb plants with him, but he has also discovered that already he has plants of the West Java variety growing in the Peradeniya Gardens. —Dr. and Miss Trimen return, we are glad to say, in good health, much pleased with their trip.

STEALING OF CACAO FRUIT FROM YATTAWATTA ESTATE.

P. C. Matale, No. 5,843.

Sanduram Pulle Kanakapulle, complainant, *v.* Sinna Tambi accused. The charge here was that on or about the 7th day of February 1891 at Yattawatta, the accused was found in possession of about 8 lb of the unripe fruit of the cacao tree, of the value of R8, without being able to give a satisfactory account of his possession thereof, and thereby committed an offence punishable under Section 368 of the Ceylon Penal Code and the 2nd clause of the Ordinance No. 22 of 1886.

The accused was found guilty and was sentenced to four months' rigorous imprisonment and to receive 15 lashes. In his judgment the Magistrate narrated the circumstances of the case and added that thefts of cacao had been increasing of late to a very large extent. He did not therefore consider he would be doing his duty, if, in every case where it was clear that accused persons had been guilty of the offence of having unripe estate produce in their possession for which they add give no satisfactory account, he did not inflict a punishment that would deter others from indulging in similar offences. In this case he said Mr. Martin had proved that small thefts from his estate had been committed for some days before accused was caught. Since accused's capture Mr. Martin had not noticed any thefts.

Messrs. Geo. White & Co.'s Annual Tea Memoranda—already referred to in our columns—will be found reproduced so far as several of its more generally interesting paragraphs, on page 784. What is said about 'prospects,' 'additional outlets,' 'manufacture,' 'style of package,' 'bulking and packing,' 'marking' and 'analysis of crop' deserves the consideration of all practical tea planters.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, March 21st.

ANNATTO SEED.—The market is well, in fact almost over-supplied with seed. Two parcels, together with 175 bags from Ceylon and the East, were offered today, and 77 of these sold at 2d to 2½d per lb. for fair to good bright.

ESSENTIAL OILS.—Citronella in tins was bought in at ¾d per oz., and Lemongrass at 1¾d per oz.

QUININE was reported rather firmer during the week, and yesterday it was even said that there were buyers at 10d, but no sellers under 10¼d per oz. for second-hand German bulk. The B & S agents say that 1s per oz. is their lowest price. Nevertheless, at today's drug auctions the article touched the lowest price yet re-recorded 1,000 oz of the Auerbach brand selling at 9¾d per oz; 2,000 oz Brunswick at 10d to 10¼d; and 4,000 oz Whiffen at 1s 1½d per oz. There has been very little business done privately this week.

A FIRMER QUININE MARKET

in our last market review shows that the article was beginning to recover from the great and sudden break that had occurred the week before on the strength of most depressing news from London, and since that time further progress in the line of improvement has been made. As the decline in the first instance began in London so has the reaction been caused by reports emanating from that market. It is difficult to ascertain what caused the break unless it be the decline in the price of bark at the recent public sale in London, but as there has been in the past, even a greater decline in the unit price of bark without effect upon the quinine market, this explanation is hardly satisfactory. In view of the fact that the effort recently made to bring the manufacturers of the world into accord on the question of regulating prices and production failed because, as it is reported, one manufacturer refused to lend assistance to the scheme, it has been intimated that the late extreme depression was the result of a bear movement inaugurated and continued for the purpose of compelling the recalcitrant manufacturer to co-operate in a measure designed for the general good. There is no evidence that the manufacturers have yet come together and unanimously adopted a plan to place the quinine market on a substantial basis, while it is a fact that the market has recovered somewhat, therefore the cause of the improvement will have to be sought in some other direction. The facts seem to be that the average speculative holder of quinine is seized with a panicky feeling whenever the article begins to shows evidences of unusual weakness from any cause whatever, and at once hastens to unload, thus increasing the weak tone of the market and quickening the downward movement. More confident buyers then step in, and after the pressure to sell has been relieved, the inevitable reaction occurs. This is an experience often repeated in the quinine market, and in the absence of any better explanation seems to fit the conditions recently prevailing in the quinine market.—*New York Oil and Drug Reporter*, Feb. 25th.

WILD FLOWERS OF CEYLON.

Nanuoya, April 6th.

Through Miss Martin's courtesy I am now able to send you the list of 54 of our hill wild flowers, portraits of which that lady exhibited at the Nuwara Eliya Show. The names have been carefully copied so as to render the task of the compositor and proof reader easy, while a careful comparison has been made with Dr. Trimen's list by Mr. A. M. Ferguson, junior, who has added Trimen's numbers in nearly every case, with native and other names, where given or known. With regard to the suggestion of publishing a work after the model of Miss Anne Pratt's "Wild Flowers of Britain," Miss Martin very reasonably doubts if sufficient encouragement could be calculated on for so expensive a venture. In any case, should publication be ultimately decided on, the lady artist feels that she must add very considerably to her present collection. She deems it probable that she will not have exhausted the hill country wild flowers (especially if she goes into orchids and ferns) under three years. This shows how rich our mountain region is in wild flowers. Meantime the advance list of those drawn, coloured and exhibited by Miss Martin is as follows:—

MISS MARTIN'S EXHIBIT OF WILD FLOWERS.

1 Coleus inflatus, 623.
2 Sopubia trifida, 558.
3 Utricularia rosea, 563.
4 Eriocaulon quinquangulare. (Kok-mota), 907.
5 Sida carpinifolia, 87.
6 Campbellia cytinoides, 561.
7 Christisonia subacaulis, 562.
8 Burmannia pusilla, 767.
9 Balanophora indica, 687.
10 Euonymous revolutns, 164.
11 Vaccinium Leschenaultii, 443.
12 Strobilanthes Hookeri, 586, (*nilu*).
13 Parochetus communis, 209.
14 Smithia blanda, 217.
15 Gentiana quadrifaria, 517. (Gentian.)
16 Utricularia, 563.
17 Exacum Walkeri, 512.
18 Do. macranthum, 512.
19 Swertia zeylanica, 518.
20 Senecio zeylanicus, 433.
21 Emilia zeylanica, } 431.
22 Do. sonchifolia. (Kadu-para) } 431.
23 Pedicularis zeylanica, 559.
24 Hapenaria aristata } 822.
25 Do. spiralis } 822.
26 Satyrium nepalense. } 823.
27 Do. do. var. white } 823.
28 Spiranthes australis, 810.
29 Liparis Wightiana, 771.
30 Kingia Notouiana. (Diyanilla), 568.
31 Impatiens Walkeri } 118. (Balsams.)
32 Do. bipartita } 118. (Balsams.)
33 Do. acaulis } 118. (Balsams.)
33 Do. macrophylla } 118. (Balsams.)
35 Valeriana Moonii, 400. (Harebell).
36 Wahlenbergia gracilis, 440.
37 Pachystoma speciosum. (Daffodil orchid.) 777.
38 Barleria Arnottiana, 589.
39 Oxalis Carniculata. (Hin-embul-embiliya). 116.
40 Trifolium minus, p. 22. (Trefoil.)
41 Cynoglossum furcatum. (Bu-kattu-henda), 528. (Forget-me-not.)
42 Vernonia setigera, } 402.
43 Do. Wightiana, } 402.
44 Sonerila hirsutula, 302.
45 Osbeckia rubicunda.
46 Do. cupularis.
47 Hygrophila spinosa. (Katu-ikira S., Nirmulli T.), 580.
48 Commelina, 864
49 Phaius bicolor, 779. (Large ground orchid, A. M. HF. Jr.)
50 ibiscus angulosus, var. grandifloras. (Kapu-kinissa), 93.
51 Crotalaria semperflorens, 208.
52 Scutellaria, 629. (Skullcap.)
52 Hypericum, 69. (St. John's Wort.)
54 Asclepias curassavica.

TOBACCO DISEASE.—In his note on the above subject, Dr. Cooke seems to have fallen into error when he says that Peronospora hyoscyami is "confined apparently" to Hyoscyamus. He does not tell us what species of Tobacco he refers to under the Tobacco of Australia. Peronospora hyoscyami has, according to Professor W. G. Farlow, badly attacked for the last four years Nicotiana glauca in Mexico and California, and great fears have been entertained in America of the pest spreading to the Tobacco-growing districts of Virginia.—W. G. S.—*Gardeners' Chronicle.*

CEYLON TEA MEMORANDA.

(*From Messrs. Geo. White & Co.'s Review for* 1890.)

Prospects.—There is little probability that the causes which brought about smaller supplies than expected both from India and China in the season now closing, will be again in operation this year. We must therefore, in the ordinary course of events, be prepared for larger crops from India and Ceylon, while the better prices realised for China Congou throughout, and the high rates paid by Russian buyers at the northern ports for fine teas suitable to their requirements, will no doubt induce the Chinese to pick and manufacture considerably more. It must not be forgotten that in 1890 almost the whole of the second crop and part of the first was destroyed by wet and unfavourable weather, while the high rate of exchange also helped to curtail shipments. Fortunately, to meet this probable larger supply, our requirements have become greater, and show a slight tendency still to expand; but as the estimate of China given overleaf will most likely be exceeded, there will be a surplus, and prices current in 1890-91 must not be looked for.

Additional Outlets.—Although the consumption of Tea in the United Kingdom has risen to rather over 5 lb. per head of population in 1890, against 4½ lb. per head in 1880, it would appear that the present consuming power of this country will not suffice to counterbalance the annually increasing output. It is therefore all the more important that every effort should be made to further foster the Trade in British-grown Tea with our Colonies, Europe and America. It is gratifying to note that shipments to Australia have shewn considerable development, the export from Calcutta 1st April, 1890, to 31st January, 1891, being 4,279,000 lb., against 3,156,000 lb. in 1889-90, and from Colombo 2,448,000 lb. against 1,076,000 lb. To America direct shipments from Calcutta are disappointing, as they have fallen from 174 000 lb. to 106,000 lb. in the same period, but from Colombo they have quadrupled, being 172,500 lb. against 42,000 lb. proving that the persistent efforts to push the Trade there have been rewarded.

As regards the Continent of Europe export figures from Calcutta and Colombo are not much guide, the great portion of the Trade being done from here. Considerable attention has been given to the promotion of business in both India and Ceylon Tea in Russia. The Government there is inclined to assist the introduction of these growths, and to prove the interest taken in the question one of the largest Russian buyers in Hankow called at Colombo on his way to China and is reported to have visited several Tea gardens.

Manufacture.—Heavy shipments being expected from all the producing countries, it behoves British planters to use every endeavour to prevent the market being flooded with mediocre Teas of poor liquor. They will therefore probably find that by plucking a little finer than usual they will make much better Tea, and in the long run show a more satisfactory result financially, as the enchanced prices obtained will more than recoup them even should the total output be smaller.

Garden managers are much more independent of the weather than formerly, owing to the introduction of withering machines, such as "Blackman's." Manufacture and the use of patent dryers are also now so much better understood, that it is quite exceptional to come across over-fired, scorched, or sour invoices, which were noticeable in former years, and the few that are seen generally result from some exceptional cause. In the early part of the season many of the Assams had a peculiar musty flavour, attributed by some to the Tea having been packed too hot into damp or not thoroughly seasoned chests.

The requirements of the Trade vary from time to time, but thick rich liquoring parcels with a bright infused leaf, which cream over when cold, are always in request, especially for Ireland. Pungent Teas of good flavour, with a greenish infused leaf, have also been in demand for some time past. Ceylons with these characteristics have occasionally sold at high rates, but unless fine quality can be secured this style of fermentation is dangerous. It must be remembered, however, that a fancy article is liable to meet with capricious sales, as in the case of Ceylon greens. The first arrivals of these were particularly choice, and brought exceptional prices, but they did not appear to meet the public taste generally, and later shipments were very difficult of sale. Teas with good leaf are likely to be in favour, being used more freely by the large blenders than Broken Pekoes, which have been somewhat neglected unless possessing exceptional strength. Leafy kinds are also taken for export, and the demand is gradually increasing. Many gardens now send large breaks of 200 packages or more, which as a rule meet with spirited competition, especially in the case of Pekoe Souchongs which are suitable for the terminal market. Planters would probably find it worth their while to bear this in mind, and instead of making so many breaks to go in for three leading ones—viz., one first-class Broken Pekoe, Pekoe, and Pekoe Souchong, instead of say, two Broken Pekoes and two Pekoes—any remaining might be classified as Broken Tea or Pekoe fannings, and occasionally an odd package or two of dust.

Style of Package.—For the Home Trade full chests are ordinary suitable, though many buyers prefer half-chests, especially for export. Leafy kinds, for self-drinking, often sell well in boxes, but to avoid the 1-lb. draft they should be under 28 lb. gross.

Bulking and Packing.—A large quantity of factory-bulked Tea has come to hand, and as more care has been displayed in filling the chests, so as to avoid crushing the leaf when treading in the last few pounds and thus altering its colour, they have been in favour with the Trade; while exporters prefer them, as they can re-ship them without the leads being cut. The tares must not, however, vary more than 2 lb. in each break, otherwise every package is turned out by the Customs authorities for separate tare. By attention to the scale on which the warehouse charges are at present based, a considerable saving may often be effected; as, for example, chests weighing 199 lb. gross, are not charged more than those of 160 lb. Half chests weighing 89 lb. gross, not more than those of 80 lb. Boxes weighing 28 lb. gross not more than 17lb.

Marking.—We would again point out the objection which exists to marking either weight or tare on the packages, the name of garden, description of tea and chest number being all that is necessary.

Analysis of Crop.—The India crop of 1890 has, taken as a whole, been good, though from time to time quality has shown considerable fluctuations. Some of the Darjeelings have been of exceptionally fine flavour, while other invoices from the same garden have been much inferior, no doubt due to climatic influence. This has also been more or less the case with the Assams, but generally the quality improved as the season advanced. Dooars at times have been desirable and chiefly of a useful quality. Cachars and Sylhets were of ordinary character at first, though later shipments shewed some improvement. Kangras and Kumaons have throughout the season been disappointing in the cup, with the exception of a few invoices of each mark, they evidently, like the Darjeelings, having been affected by the inclement weather. Although some of the Travancores have been of good strength and flavour, the average of many gardens is low. The appearance of the dry leaf might often be improved, and no doubt this will be remedied as the out-turn increases. Not so much variation in the quality of Ceylons has been noticeable as in former years; the crop, though a very useful one, has been rather deficient in choice parcels. The general result should be satisfactory to garden proprietors, as although during a great portion of the season exchange has been high, they have not, as in the case of India, suffered from a diminution in out-put through the early setting in of cold weather. The rise in the price of silver also acted as a salutary check on the shipment of common China Congous. As previously noted, the general quality of Javas has shewn a distinct improvement in consequence of the plants raised from Assam seed becoming more developed, so that in many cases they are similar, to Teas of India growth. Although the total average price is still rather low, that obtained for the produce of several estates is very good, ranging from 10d. to 1s. 1d. per lb.

COCONUT *VERSUS* PALMIRAH.

European planters and native planters too who more readily copy the faults of their European guides than follow their virtues, cut down the palmirah to make room for the coconut. This is a senseless procedure. First because no other tree that grows high can ever injure the coconut trees, unless it shuts out air and light. On the contrary it protects the coconut trees from the effects of the frequent droughts to which the Pachchillapalli district is liable, if its leaves or branches are lopped off from time to time, when they show a tendency to obstruct air and light. The palmirah and the margosa are more conducive to the growth, preservation and fructification of the coconut trees than inimical to them. Secondly, because sixteen palmirah trees can very well stand in the space occupied by one coconut plant. Rejecting eight of these as male trees, we have 600 female trees per acre. Each female tree yields on an average 6 cents per annum, *i. e.*, R36 per acre. We get these R36 per acre without sowing, transplanting, fencing, watering, watching, digging, manuring, picking, peeling, drying, weighing, carting etc., all which have to be done in order to get something out of the coconut and this something, after deducting all expenses, can never exceed R20 per acre in this district.

If we take into account the interest of the capital laid out in the purchase of the coconut estate, the R20 will come down to R10. But if we take into account the interest of the money laid out in the raising of the coconut trees, the industry will be found to entail a dead loss of R30 or 40 per acre per annum. There is not a single estate in this district, but has changed four or five hands, the last purchaser paying not more than one-fifth or one-sixth of the original cost of planting up the estate with coconut.

If the palmirah be utilised for treacle, the male trees will also become available and the income per acre will be raised to R72 per annum.

It is usually said that the palmirah takes a long time to bear. If the attention paid to the coconut be paid to the palmirah, it will come into bearing at the same age at which the coconut does, *i. e.*, 20 years. People say that the coconut tree bears at so early an age as 4. This is true in exceptional cases. But I will not alter my limit of 20 years, unless one who has actually planted a coconut estate demonstrates to me that its income covered its own current working expenses before its 20th year. I won't ask him to include the interest of the capital laid out in the purchase of the land or in the various operations from the time the trees were planted to the time of their coming into full bearing. If these were included, no coconut estate would be found paying in this district.

The average age of the coconut tree is 60 years, that of the palmirah is over 100. When the latter dies through accident or exhaustion, the trunk is worth from 25 cents to one rupee, if not more. When the former dies, you require at least 5 cents to cut it down or burn it.

The palmirah cannot be choked out of existence by any foreign vegetation, but the coconut can be and always is. The palmirah sows itself, but the coconut does and cannot. The palmirah like the coconut has many enemies, such as cattle, beetle, drought, lightning, cyclones etc., but the palmirah withstands them much better than the coconut. It is a pity that the pioneers of planting did not plant palmirahs rather than coconuts in this peninsula.—*Com.*—Jaffna "Patriot."

DEATH OF THE *VICTORIA REGIA* AT THE GORDON GARDENS.

Our morning contemporary has the following:—

DEATH OF THE "VICTORIA REGIA."—This beautiful aquatic plant, which was brought from Madras and placed in the lower fountain basin in the Gordon Gardens, appeared to thrive at first. Afterwards, however, it seemed to be affected by sun and wind, and its large round leaves curled up. A cadjan screen was put up on one side, but that accomplished nothing, for at last the *Victoria regia* has died, and the remains have been removed.

With reference to the above a correspondent writes to us:—"I annex an extract from 'Firminger's Manual of Gardening' which may account for the demise of this plant, if no other cause has been discovered. I have not been to look at the plant myself for some time." The extract is as follows:—

"*V. regia.*—The plant is found not to exist more than two years, when its place must be supplied by a fresh one raised from seed, which in the vicinity of Calcutta it bears abundantly. If the seeds have to be conveyed to a long distance, it has been found that they will only retain their vitality by being kept in phials of pure water. . . . . . The seeds are sometimes very long in germinating." ("Firminger's Manual of Gardening for Bengal and Upper India," 4th Ed., Part IV, page 449.)

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.—From the list of those published in the *Journal of Botany* for January, we extract the following as being interesting to horticulturists:—

"THWAITES, GEORGE HENRY KENDRICK (1811-1882): b. Bristol, 1811; d. Kandy, Ceylon, Sept. 11. 1882. Ph.D. F.L.S., 1854. F.R.S. C.M.G., 1878. Local Sec. Bot. Soc. Lond., 1839. Lectured at Bristol, 1846. Superintendent, Peradeniya Bot. Gard., 1849; Director, 1857-1880. Contrib. Bristol list to Top. Bot. and to 'Phytol.' from 1841. 'Enumeratio Pl. Zeylaniæ,' 1858-64. Described *Dasygloia amorpha* for Eng. Bot. (2941). Pritz 318; Jacks. 612; R. S. C. v. 989; Proc. Linn. Soc. 1882-83, 43; Gard. Chron. 1874, 438, with portr.; 1882, ii., 505; 'Athenæum,' 1882, 500. Portr. Kew. *Thwaitesia*, Montagne. *Kendrickia*, Hook f. —*Gardeners' Chronicle.*

THE GINSENG TRADE IN CANADA.—Ginseng, the root of Panax quinquefolia, var. Selimseng, is well known as a valuable medicinal product of China, Manchuria, and Corea. A kind of Ginseng, P. quinquefolia proper, is also grown in America, and the root exported thence to China, but this industry has of late years much declined. Under the title, however, of "The Revival of an Old Canadian Industry," our contemporary the *Chemist and Druggist* has the following:—"Ginseng, the drug *par excellence* of Chinese *Materia Medica*, was formerly extensively collected and dried in Canada. It was one of the first articles of commerce exported from Canada after the Peace of Utrecht, and for a time considered hardly less important than the fur trade. This plant was discovered growing near Lachine, by the Jesuit Lafitan, in 1716. He had learned of its value as a medicine in China, and a Company was formed for its export to China, Tartary, and Japan. When first introduced, the price at Quebec was from 30 to 40 dollars (or cents) per lb, and anyone was permitted to sell the plant. But in 1751, the Company obtained a monopoly, and excluded all others from the trade. The price rose to 12 livres, and at one period even to 33 livers per lb. As the demand for the plant increased, the care with which it was obtained and prepared was relaxed. It was gathered out of season, and dried imperfectly before it was ripe. Under these circumstances Canadian Ginseng soon lost its reputation in China, but during the time when the drug realised high values, agriculture was neglected altogether in some localities, the entire attention of the inhabitants being given to the collection of Ginseng, with the result that in some parts of Canada the plant entirely disappeared. When the trade was at its maximum in 1752, the value exported was about 500,000 livres per annum, but two years later it had sunk to 33,000 livres. The Company then ceased to purchase the plant, and the trade entirely disappeared. All that remained of it was a proverb among the people, when speaking of some matter having failed, that it had come to nothing as the ginseng, *C'est tombe le Ginsong.* It is a strange fact, that the word Ginseng has the same meaning both in the Chinese and Iroquois languages. At present Ginseng gathering is again becoming a large industry in Canada, the root being collected for sale to the Chinese in the United States."—*Gardeners' Chronicle.*

COCOA AND ITS CULTIVATION, AND THE PREPARATION OF CHOCOLATE.

The cocoa tree is very common in the warm regions of America, but since the conquest it has been cultivated in Mexico, in Guatemela, and Nicaragua. Under the kingship of Montezuma, the Spaniards transported this tree to the Canaries, to the littoral of Venezuela, to the Antilles. The cocoa tree requires a rich soil, deep and damp. Nothing suits it better than a grubbed-up forest. All the plantations are similar; shady localities, at a short distance from the sea or on the banks of rivers. When a piece of land is selected as fit for the cultivation, a commencement is made by assuring a system of shade. If it is to be grubbed up, the trees which have been stripped are left standing, or else there are planted some shrubs of rapid growth, such, for instance, as the *Erythrina umbrosa* (bonana tree.) To the South of the Equator, in the province of Guayaquil, the planting is done directly by seeds, while in Venezuela they are planted out as seedlings, in the latter case every precaution being taken to protect the young plant against the sun's rays. The seeds germinate in eight or ten days; in the second year the cocoa tree reaches a height of about a yard, and it is then that it is topped. The tree generally flowers at the age of about thirty months, when climatic conditions are favourable. There are few plants, the flowers of which are so small, and especially so disproportionate to the size of the fruit. The flowers do not appear separately, but in bouquets, on the same stem, at all elevations, on the mother branches, and even on the ligneous roots running along the surface of the soil. A gentleman, who has lately studied the question, in his researches on the constitution of the cocoa berry and on the composition of chocolate, gives some interesting particulars as to the distances which separate the trees and the care brought to bear on their cultivation. From the fall of the flowers to maturity nearly four months elapses. The fruit, or *cabosse*, is divided into five lobes; its weight varies from 300 to 500 grammes. The seeds which are taken from the fruit are exposed to the heat of the sun; during the night they are raked into a heap under a shed. An active fermentation soon set in, which would be hurtful were it allowed to increase. From 100 kilogrammes of fresh seeds our authority has seen 45 to 50 kilogrammes of dry and vendable cocoa extracted on a hacienda in Aragua. A cocoa tree which has attained the age of seven to eight years annually furnishes an average of o kilo. 72. At Gigante, in Upper Magdalena, the yield is about 2 kilos. The cocoa is decorticated by the application of moderate heat; the shell having become weak, it is then removed by the winnowing. In torrefication the berry acquires, like that of coffee, an odour, due to a low proprotion of a volatile principle. This is the aroma perceived in chocolate. The cocoa berries are rich in nutritive principles. Independently of a strong dose of fatty matter, they also contain azoted substances, similar to albumen and caseine, theobromine and compounds of ternary composition, these elements necessarily varying in quantity according to the place of growth. Numerous analyses have been made at the Conservatoire of Arts and Sciences. The following is the result of an examination of cocoa, coming from Trindad:—Butter, starch, theobromine, asparagine, albumen, gum giving mucic acid-tartaric acid free and combined, soluble cellulose, and matters of an indeterminate nature. As is well known, decorticated cocoa slightly roasted, and separated from the seeds, is the basis of chocolate. In the products of French factories, there have been found in chocolate from 55 to 59 per cent of sugar; in Spanish products, 40 to 53 per cent. In chocolates honestly prepared only cocoa and sugar should be present, too large a quantity of the latter weakening the quality. Thus, the gentleman from whom quotations have already been given, when about to start on a long journey in America, procured a preparation of 80 parts of cocoa and 20 parts of sugar, a composition represented by:—

	Parts.
Sugar	20
Butter	10
Albumen	41
Phosphates	3
Other matters	26
	100

This was a useful addition to the ration which consisted of meat dried in the air (tassajo), maize biscuits, or cassava cakes. The Mexicans made a paste with cocoa which they called chocolate, in which they mixed a little maize. Up to the sixteenth century travellers differed widely in their opinions as to chocolate. Acosta considered from a prejudiced point of view. On the other hand, Cortes probably exaggerated the value when he pretended that by drinking a cup one could march throughout the whole day without taking any other nourishment. In France, the new drink had its partisans and its detractors. Madame de Sévigné, in a letter to her daughter said "I have wished to reconcile myself with chocolate: I take it in the afternoon to digest my dinner, with a view to supping well, and I take it to nourish myself, and in order to fast till the evening; it has brought about the effects I wished; that is why I find it pleasant; it acts according to the intention."

Chocolate in its small volume contains a large portion of alimentary matters. Humboldt says that it has been truly remarked that in Africa rice, gum, and shea butter aid men traversing the desert; and in the New World, he adds, chocolate and maize flour render accessible to him the plateaux of the Andes and the vast forest. By the addition of albumen, fat, of the congeners of sugars, and the presence of phosphates, cocoa recalls the composition of milk, the type according to Prout, of every nutritive regimen. Having arrived at a certain stage of civilisation, man frequently adopted into his food plants which acted on his organism in the manner of fermented drinks. Like wine taken in proper quantities, these aliments favoured digestion, improved the memory, exalted the imagination, and developed a feeling of well-being without giving place to a hurtful reaction so often the case in the abuse of alcoholic drinks.

It is a curious fact that human races, separated by the greatest distances and never having had any communication the one with the other, prepare, with certain vegetables, exciting drinks, such, for instance, as tea in China, coffee in Arabia, cocoa in Peru, mate in Paraguay, cocoa in Mexico, utilising either the leaves or the seeds of plant of which the seeds of plants of the botanical species have no analogy, but which, despite this difference of natural source, excrcise a similar action on the nervous system and on digestion. The reason is that there are in these different plants substances possessing the constitution of alkaloids, and endowed with similar properties; that is, cafeine in the leaves of tea plant, of maté and in coffee, cocaine in the leaves of coca; and theobromine in the berries of the cocoa tree. Thus the Chinaman, the Arab, the Pernvian, the Paraguayan Indian, the Inca, and the Atzec were under the influence of a similar agent when they had taken their habitual drink.—*Indian Grocer.*

[This is the first time we have heard of the "*The Indian Grocer*"?—ED. *T. A.*]

COFFEE IN BRAZIL.—The following communication, addressed to the *Jornal do Commercio* of this city, was published in that paper on the 5th instant:—"I have seen in the *Jornal do Commercio* an item taken from the *Rio Novense*, of Rio Novo, in regard to the coffee crop of that municipal district. From the observations I have made of the heavy flowering in the north of S. Paulo, I can assure you that the trees will not produce more than half the crop that flowering seems to promise."—*Rio News*, Feb. 10th.

KOLA: WHAT IS IT?

BY THOMAS CHRISTY, F.I.S.

Having been consulted by several gentlemen who are manufacturers as to the best way of administering kola and introducing it amongst workmen, I thought it would interest you if I furnished you with a copy of my reply.

It is well known that intoxication or drunkenness may be produced from several causes, one may be the craving for drink from overwork, or from indigestion, or from pain; and in old times it used to arise from sitting in the public-house for want of something better to do; but in the present age of newspapers and the advance in education, a very large number of people who used to drink for want of something better to do now have not this excuse, therefore it is easier to attack the causes enumerated. It has been found that kola has an extraordinary effect on beer and spirits, and large bottling establishments, where the "ends" of the casks have been drawn down as low as it was thought safe, the thick residue has been emptied into large casks, and a small quantity of kola stirred round, and in quite a short time it has cleared the beer to such an extent that nearly the whole quantity could be bottled off without in any way impairing its keeping qualities.

At the Linnean Society we had the evidence put before us from gentlemen living in the West Indies of what they had repeatedly witnessed, viz., that men who are insensibly intoxicated are by the use of kola restored in a very short space of time to sobriety; a bad headache, produced perhaps by new spirit, is acted on in a very short space of time, but what is of more importance is this, that the craving for drink is at first suspended, then stops, and a more healthy state of the system follows; bodily exercise is enjoyed, and the mind appears bright.

No more than the owner of a mill or factory regrets the loss of the assistance of his manager or best workmen from intemperance, and to my knowledge the most happy results have ensued from kola in some form or another being used. When the head of a family brightens up he infuses a healty tone to all around him.

In the year 1520 cocoa was introduced, and it got better known about 1659. I do not propose to go into the merits of this fruit. Suffice it to say it contains about 50 per cent. of butter, which has to be extracted or thrown down by the addition of starch before it can be used as a beverage, or it would produce indigestion.

With tea the relief to a weary body is very temporary, and for a brain-worker the tannin sorely troubles those who use it as the most convenient form of stimulant.

Coffee, pure and of good quality, well made, is one of the greatest rarities, and few things are more adulterated before it reaches the consumer. Kola is consumed by a large number of the African tribes, and reports sent home lately to the British Government showed that those labourers who took it as food could do double as much work in one day as those who did not. The reports in the Press have been so ample that I only desire to quote instances that have come lately to my knowledge. I am very proud of having been the introducer of this valuable food, and my reticence on the subject will be appreciated. Many of the most wonderful records of cycling against time have been chronicled as largely due to the use of kola. The riders say that though the exertion of the body was at the utmost stretch, still the head and brain were clear and the physical powers were strengthened. Even a small quantity of kola had a magical effect; it appeared to be as much a tonic as an anodyne to the brain, and whereas only a few minutes before the whole of the machine was as laborious to work as the treadmill itself, the efforts of the rider were made pleasurable exercise, and the desired speed was attained with less exertion and the happiest results, so that "beating the record" seemed an easy matter. There was no sense of lassitude or prostration, but instead a cheerful feeling pervaded the system; a healthy appetite was created for food, and what was more important, it was digested with a satisfaction seldom experienced before.

During the late examinations many ladies felt the usual anxiety to surpass the "lords of creation," and in London they also had to endure the thick atmosphere from the fog so trying to delicate organisations. I recommended fathers who were in despair when their daughters declared that they must give in, to try kola, but of course without giving any details as to what it was.

In certain cases they took it for breakfast, and then again in the form of chocolate for lunch. The result was a success, and aided by the assistance to the bodily and mental powers thus given, the highest positions were gained, without the recurrence of headache or nervousness.

For working people kola is prepared in the form of chocolate, so that it can be carried in the pocket and a small piece broken off and eaten when the feeling of hunger, thirst, or weariness occurs. It acts in a few minutes. A teaspoonful of kolatina at breakfast, in hot water or milk, or even alone, is sufficient for a breakfast, but the effect lasts for several hours.

Many people who know of this preparation employ the pure kola nut, ground to a fine powder. This they boil with milk, but it is an acquired taste.

In the early part of this year a coloured doctor informed me that the men carrying goods for sale go away from the coast for journeys of 24 hours; all they depend upon are kola nuts and water, and they bring back loads of goods that they have taken in barter.

In Western Africa kola nuts have even taken the place or rather fill the place of a currency in some parts, and are very highly esteemed by the natives.

I give the following letter from Mr. A. E. Floyer, F. L. S., an intrepid traveller:—"I think there can be no doubt that kola chocolate is a genuine good thing. I have used it a great deal lately, and I think the following test (which I am about to say, was in some points involuntary) conclusive. I went into the hills on the morning of the 9th with my shikarri; we did ten hours' very severe climbing, much of it anxious work, in the dark; we slept on the rocks, and the next day ten hours' more very severe climbing, and at last got out of the mountains. It is no exaggeration to say that we arrived at the camp in capital spirits, though very leg weary. During these two days we had divided between us four biscuits, three oranges, and three tablets of kola chocolate; practically nothing but kola. It seems to have no ill effects, nor interferes with ordinary stomach arrangements or with sleep. Half a cake at 10 a.m. and the same at 3 p.m. and you can wait till midnight before you lunch, and have a good appetite when you get it.

I am confident that its extraordinary properties have only to be generally known to be recognised by all classes of the community, and more particularly by persons whose occupations are such as to involve constant and sustained employment of their vital powers.—*Cheshire County News.*

INSECTICIDES.

The following notes by Dr. J. C. Neal, the entomologist to the State Agricultural College, Florida, U. S. A., will be found of interest:—

Nothing has been done in practical entomolgy that has shown better results than the use of emulsions containing kerosene or insoluble poison held in suspension, and their application to infected plants in a fine spray by various atomisers and spray pumps. With one of these machines, an insecticide can be brought into contact with the insect, and its feeding ground thoroughly impregnated with poison. It is needful that the spray be very fine, and that it be applied with force to reach every infected part, or the hiding-places of insects. For cases like infected buildings, as chicken-houses, that are usually very difficult to keep clear of mites and tick-fleas, the spray of carbolised whitewash, tobacco, kerosene, oil of Tansy, &c., is easily applied.

I append a few formulas that have been tried and found to be valuable:—

I.—SOLUTIONS.

1. Tobacco, 1 lb.; boiling water, 3 gallons; strain when cool. Very effective when used as a spray against flea-beetles, lice, aphides (plant-lice), and ticks.

2. Quassia-chips, 1 lb.; boiling water 3 gallons. This very bitter solution is good for prevention rather than cure. Apply as a spray to Rose bushes, and to kill plant-lice.

3. Pyrethrum; 1 oz. of the "Buhach" powder added to 2 gallons of cold water for Cabbage, Beets, Tobacco, or any plant used for food, as this is not poisonous.

4. London Purple, Paris Green; actively poisonous. Use 1 lb. of the poison to 200 gallons of water or other solutions. Dissolve a little flour paste in the water to make it sticky. Stir frequently. Applied to trees, it is a sure cure for all insect plagues.

5. Bordeaux Mixture.—This, while primarily a fungicide, has some good qualties as an insecticide. It is prepared thus:—1 lb. sulphate of copper, dissolve in 1 gallon of hot water in one vessel; in another, 1 lb. rock lime is slaked in 1½ gallon cold water, and, when cool, pour into the copper solution and strain; add 2 gallons of water, and it is ready for use. (Cook).

6. To this, add London Purple, 1 lb. to 200 gallons of the Bordeaux Mixture. This sprayed over non-bearing Grape vines or Tomato vines not in bloom, &c., will prevent rot, and insect life as well.

7. Soap.—1 lb. resin soap to 1 gallon hot water. This, used as a spray, is often a valuable remedy for the attacks of small and soft insects; in fact it can be used to advantage for soft scales, when they are few. It should be often used to get the best effect.

8. Water in which tar has been placed acquires some value as an insecticide.

II. EMULSIONS.

1. Stronger Emulsion of Kerosene.—4 lb. soap, dissolve in 1 gallon hot (boiling) water; remove from the fire, and add 2 gallons kerosene while hot. Churn with a spray-pump violently till the oil is emulsified; add 27 gallons cold water for use.

2. Weaker emulsion (Cook).—1 lb. soap dissolve in 2 gallons hot water as before, but add only ½ gallon kerosene, and dilute till 8 gallons are made. Adding ½ pint spirits turpentine to No. 1, increased its stability (Tracy). Allowing even 40 gallons of water to be added to 1 gallon of the emulsion, and sprayed on Tomato worms, it was very effective, and did not injure the plant in the least.

3. Emulsion 1.—Adding 2. oz. of balsam of Fir with the kerosene makes an emulsion that adheres better to the surface of the leaves, and is slightly superior to No. 1 for the armoured scales.

4. Using emulsion 2, only substituting the same quantity crude carbolic acid for kerosene, is especially valuable for Oak and Pear insects.

5. The same formula, using oil of Tansy or Sassafras 1 oz. in place of the ½ gallon kerosene, is efficacious for roaches, mites, ticks, bed-bugs, and pests.

III. ARSENICAL, RESINOUS, AND OTHER COMPOUNDS, FOR SPRAYING.

1. To kerosene emulsion No. 1 add 1 oz. London Purple, and mix well. Highly recommended.

2. Resin compound.—Caustic soda, 1 lb.; resin, 8 lb.; to make 32 gallons compound. Dissolve the soda in 1 gallon boiling water; take out half; add the resin slowly to the remainder and boil, stirring rapidly; when dissolved, add slowly the part taken out. Dilute till it will pass readily through a thin cloth, which should be always done. Dilute before using, to 32 gallons. This alone is very valuable against most scales, but the addition of 2 oz. London Purple makes assurance doubly sure, against even the dreaded Icerya.

3. White arsenic, ½ lb.; sal soda, ½ lb.; water ½ gallon; boil till a solution is made, then dilute to a gallon. One quart of this to 50 gallons resin compound—use on Peach, Pear, and Plum, either after fruit is gathered or just as bloom has fallen.

IV. POWDERS.

1. While slaking 1 peck fresh lime, add 1 quart of kerosene, sift out lumps; apply lightly to Cucumbers, Melons, and Tomatos, for beetles and squash-bugs.

2. 50 lb. land plaster, mix 1 pint crude carbolic acid; sprinkle over leaves and Vines for aphides and beetles.

3. Pyrethrum.—This, the powdered flowers of the Pyrethrum, when fresh, is especially valuable if sprinkled on infected leaves, or in boxes, drawers, &c. House flies and mosquitos are easily subdued by closing up the room tightly and slowly burning in it a spoonful of the powder. It is slightly narcotic, but not at all dangerous to human life. For infected Cabbage, Lettuce, Celery, and the like, or Tobacco, it is the best insecticide we have, involving no danger if eaten.

4. Tobacco.—This insidious narcotic is valuable in the destruction of plant-lice, mites, &c. Applied either as a powder or by its fumes it often is quite beneficial.

Bisulphide of carbon, like chloroform, is highly volatile, but its vapour, unlike that of chloroform, is very explosive. Bins and corn cribs can be easily rid of ants, weevil, rats, mice, beetles, &c., if the room be made air-tight, and occasionally filled from the top with the vapour of bisulphide of carbon.

This is the only way in which our farmers ever will keep Corn, Peas, &c., from insect attacks,—*Gardeners' Chronicle.*

MR. T. S. ANDERSON, of the Gartmore Estate, inserts this advertisement in the Ceylon papers: "Not having sufficient tea from which to supply the great demand in the London Market for Golden Tips, I undertake under certain conditions and for a Fee of R125, to shew Planters how to prepare the same. The Tea, so prepared, will be guaranted to be equal to the sample of Gartmore Tea, sold in Mincing Lane for £10 12 6 per lb. and the manufacture to cost not more than 25 cents extra per lb." This is all very well, but can Mr. Anderson tell us (1) to what extent the value of the rest of the leaf is depreciated by plucking golden tips; (2) what demand there is in London for tea at £10-12-6 per lb. It is all very well paying a fee of R125, spoiling the bulk of your tea, increasing the cost of manufacture by 4 annas to find that when it arrives in the London Market 2s or 2s 6d per lb. is the outside it will realize, which will probably be the result should any large consignments of Golden Tips be made.—*Madras Times.*

The ARTIFICIAL MANURES, &c. (ADULTERATION) BILL, which was introduced into the House of Commons and read a first time in November, but which has just been issued in a revised form, has for its object the better prevention of frauds in the manufacture and sale of artificial manures and other preparations for agricultural purposes. This it proposes to attain by making it compulsory, in all sales in quantities of not less than one hundredweight of artificial manure or feeding stuffs, for the seller to deliver to the purchaser a guaranteed analysis of the article sold, and by making misrepresentation in this certificate punishable by summary process. In order to facilitate the carrying out of the law, the Bill provides for the appointment by every County Council of "one or more persons possessing competent knowledge, skill and experience as analysts of artificial manures and feeding stuffs within such county," from whom purchasers will be entitled to obtain an analysis on payment of a fee of 5*s*. All appointments of these analysts would be subject to the approval of the Board of Agriculture, which may require to be supplied with satisfactory proof of competence; but the only other limitation is that no person shall be appointed as analyst who is engaged directly or indirectly in the trade or manufacture of the substances he may be called upon to examine. The Board of Agriculture would also be empowered to authorise a County Council for a specified time to appoint inspectors to obtain and deal with samples of manures and food-stuffs offered for sale in a manner corresponding to the provisions of the Sale of Food and Drugs Act.—*Gardeners' Chronicle.*

QUININE AND JAVA CINCHONA.

The market value of quinine has now declined to a point unprecedented even in the history of the Fallen Drug. Yet in Mincing Lane there are still many who, more unteachable than the Bourbon kings, appear to have learnt nothing, and forgotten all of its previous commercial history. Every other man one meets, no matter how ludicrously his forecasts have been falsified in the past, still clings to his own pet theory on the subject of the future of the quinine market, and the number of those who, with "Athena's wisest son," are frank enough to admit "all that they know is, nothing can be done," seems scarcely greater than that of the just men in the Cities of the Plain.

A favourite assertion just at present is that the price of quinine fluctuates altogether independently of the movements of cinchona bark, that, in fact, the two articles now revolve in different spheres. We are no adherents to that theory. On the contrary, we have more than once stated our view that the natural causes which have operated to depress both cinchona bark and its derivatives have been assisted by the unwise contracts made by certain Java planters with Continental quinine manufacturers of a speculative turn of mind. Full particulars of these contracts were published in this journal last year, and their substantial accuracy stands unchallenged. A variety of minor causes, such as the condition of the money market, the avowed, if unintelligible, policy of at least one of the English manufacturers to depress quinine, and so forth, have accentuated the state of limpness from which that drug is now suffering, but we see no reason to alter our opinion that the primary cause of the depreciation of quinine lies in the excess of the bark supply, and that a curtailment of the production of cinchona must precede any lasting improvement in the quinine market. So far as Ceylon is concerned the output of bark is already visibly dwindling away, and will continue to lose importance year by year as a factor in the calculations of the quinine dealer. The official export figures, which we quote below, are eloquent on this point:—

CEYLON EXPORTS.

1886	1887	1888	1889	1890
lb.	lb.	lb.	lb.	lb.
14,675,663	12,805,003	12,482,817	9,455,641	8,779,140

The displacement of Ceylon by Java, as the centre of cinchona production, is now as much an accomplished fact as the dethronement of Chinese by Ceylon and Indian teas in the British markets. Until 1890 it seemed doubtful whether Java would ever gain the mastery of the cinchona market. But in that year 4½ million ounces of quinine in the bark were sold by public auction in Amsterdam against 4 million ounces disposed of at the cinchona sales in London. That fact marks the commencement of the era of a Dutch supremacy in the cinchona market. There is no use whatever blinking it, however unpalatable it may be to London importers and brokers; and if the recognition of it should lead to the exercise of greater care and discrimination by the Ceylon planters, and the modernisation of London sale methods, our present loss may prove our future gain. We are induced to make these observations *apropos* of the annual report of the Soekaboemi (Java) Agricultural Association, just published. From this report, which is compiled with the greatest possible care, and forms a valuable guide to those interested in the progress of cinchona, it appears that the total crop of Java cinchona, for manufacturing purposes, in 1890 was 3 million kilos. The estimated crop for 1891 is 3½ million kilos. The average equivalent of sulphate of quinine in the bark was 3·94 per cent. last year, and is estimated at 4·07 per cent. for 1891. The total quinine yield of the Java manufacturer's bark of 1890 was 120,000 kilos, fully one-half of the world's estimated consumption. This year it will be 140,000 kilos., or about four-sevenths of the world's estimated consumption for 1891. We have tested two former estimates published by the Association in 1890 and 1889, and in each case found them to be somewhat below the actual yield. There is therefore no reason to believe that the estimated figures for 1891 are exaggerated. There are now 114 known cinchona plantations in Java—in 1889 there were 115—and of these only 30 neglected to send full particulars of their cultivation to the secretary of the Association. Fifteen plantations will yield no crop at all this year, mostly because the trees are as yet too young, and only four or five are reported to have been "abandoned" or "uprooted." The facts are that, in spite of four or five seasons of starvation prices, the number of cinchona plantations in Java has not lessened. In 1888 there were 10,622 bouws (1 bouw = 1¾ acre) under cinchona in Java, in 1890 there were 18,126 bouws. Another fact worthy of consideration is the existence of a tendency to a decline in productivity in the larger plantations. Thus, the nine largest estates on the island, including the Government plantations, yielded a crop of 1,168,156 kilos. bark in 1890, but they only estimate their ouput for 1891 at 912,000 kilos. The Government plantations produced only 240,000 kilos. bark last year, instead of an estimated yield of 300,000 kilos. This yield included 95,000 kilos. pharmaceutical bark. But the reduced output was not owing to natural causes so much as to partial compliance with the desire of the private planters that the Government gardens should temporarily cease to put forth their full strength, and thus help them to tide over a bad season. The result of this accommodation on the part of the Government is that they will have to get rid of their surplus in 1891 and the succeeding years. Hence their output for 1891 is estimated at 212,000 kilos. manufacturing, and 150,000 kilos. pharmaceutical bark. Two other possible portents of things to come lie in the facts that nearly all the medium-sized plantations in the western cinchona districts of Java are anticipating a considerable increase in their output, and that the figures denoting their area under cinchona cultivation point to a further decided increase in the near future. Take, for instance, the nine principal plantations alluded to above. They are among the oldest in the island, and their bark is the best known in the markets. Their total area under cinchona covers 3,687 bouws, and their yield of dry bark in 1890 has been about 317 kilos. bark per bouw. Now select nine other typical plantations from among the large number of those which have not yet attained their full producing power. These nine plantations cover an aggregate of 3,747 bouws. In 1890 they produced 46,400 kilos. bark or about 124 kilos. per bouw. In 1891 they are estimated to produce 536,000 kilos., or 143 kilos. per bouw. When they shall have attained the ripeness and producing power (317 kilos. per bouw) of the nine most fully matured estates in the island, they ought to produce 1,187,799 kilos. These figures do not look as if the supply of bark from Java is about to dwindle away. Yet, in spite of the tale they tell, a number of Mincing Lane people affect to treat the Java bark-production as a factor of no account in the quinine market. There is room in the drug market for an "Ancient Mariner," who stoppeth some of these, and for his hearers' own ultimate benefit, if not present delectation, keeps dinning into their ears the true moral of the story from the islands of the East.—*Chemist and Druggist.*

LIBERIAN COFFEE IN THE STRAITS.

The statement we append will be read with interest by those planters and proprietors who are now turning their attention to the cultivation of this product. The Native States of the Malay Peninsula which have been opened up to coffee cultivation by European enterprise—principally through planters of Ceylon experience—are situated on the Western slopes of the mountain chain which traverses the entire Peninsular from North to South, forming as it were a "backbone," rising from 2,000 to 4,000 ft. in height, but decreasing on proceeding to the South. The surface is well watered, and very heavily timbered. The coffee, solely Liberian, is planted on the slopes of the main range, and on isolated hills, of which there are a vast number studded over the country. Estate bungalows are constructed entirely of timber obtained on the spot, and roofed in with *attaps*, the plaited fronds of a palm which grows in several varieties. The timber

felled and burnt off in opening up an estate would be of immense value could it but be got to the coast for export. The state of Johore extends from the territory of Malacca to the Southern shores of the Peninsu'ar, and is separated from the island of Singapore by a narrow strip of water. Like the other States it is a British Protectorate, and the Sultan, an enlightened Malay uobleman, offers every encouragement to European enterprise. Sungei Ujong is situated North of Malacca and South ot Selangor, and contains soveral very flourishing estates, notably those belonging to Messrs. Hill and Rathborne, a large and flourishing firm of planters and contractors, who have done much towards opening up the Peninsular to European enterprise, both in the matter of planting experiment and making roads. The State of Perak is North again of Selangor, and adjoins Siamese territory. Both Perak and Selangor are promising fields for the planter. The soil on the hills and plains is most fertile, water is plentiful, and the rainfall abundant. Both States are flourishing mining centres, and are being rapidly opened up with railways. The great waut throughout the States is proper labour, which has to be imported. The Chinese are unsuited for coffee work and are very expensive, and the Indian labour, which is now being largely imported, though to a certain degree successful, is, as yet, far from being satisfactory. The yield per acre is simply wonderful if it can only be kept up, but it must not be forgotten that it is the result of virgin soil and soil very rich at that. Tho elevation of Weld's Hill estates, by the way, is, we understand, about 1,500 feet. A railway runs from Klang on the coast into the heart of the Selangor planting district, with good cart roads branching in all directious so that as the good effects of the virgin soil wear off, fertilisers can be applied at little cost so far as transport, usually about the heaviest item in the expense of manuring, is concerned.

		PRODUCED.	
LIN-UM ESTATE, IN SUNGEI UJONG—		Cwts.	Cwts.
In 1884,	28 acres under 4 years old	... 99	
,,	12 ,, ,, 3 ,,		
In 1885,	28 ,, over 4 ,,	... 307½	
,,	12 ,, under 4 ,,		
,,	25 ,, ,, 3 ,,		
In 1886,	40 ,, over 4 ,,	... 369	
,,	25 ,, under 4 ,,		
In 1887,	65 ,, of coffee in full bearing		... 409½
,, 1888,	65 ,, ,, ,, ,,		... 643½
,, 1889,	65 ,, in full bearing		... 732
,, 1890,	65 ,, ,, ,, ,,		... 692
			2,477
Average per acre for 4 years in full bearing			9½ cwts.
S'LIAN ESTATE IN SUNGEI UJONG—			
In 1885,	8 acres under 4 years old	... 92	
,,	28 ,, ,, 3 ,, ,,		
In 1886,	8 ,, ,, 5 ,, ,,	... 336	
,,	28 ,, ,, 4 ,, ,,		
,,	9 ,, ,, 3 ,, ,,		
In 1887,	36 ,, ,, 5 ,, ,,	... 238	
,,	9 ,, ,, 4 ,, ,,		
In 1888,	45 acres in full bearing		... 495
,, 1889,	45 ,, ,, ,,		... 471
,, 1890,	45 ,, ,, ,,		... 481
			1,447
Average per acre for 3 years in full bearing			10 7-10 cwts.
WELD'S HILL ESTATE, IN SELANGOR—			
In 1886,	19 acres under 4 years old	... 325	
,,	36 ,, over 4 ,, ,,		
In 1887,	55 acres of coffee in full bearing		... 402
,, 1888,	55 ,, ,, ,, ,,		... 501
,, 1889,	55 ,, ,, ,, ,,		... 657
,, 1890,	55 ,, ,, ,, ,,		... 376
			1,936
Average per acre for 4 years in full bearing			8 8-10 cwts.
BATU CAVES ESTATE, IN SELANGOR—			
In 1888,	11¼ acres under 4 years old		... 78
,, 1889,	11¼ ,, 5 ,,		... 72
,, 1890,	11¼ acres of coffee in full bearing		... 131
Average per acre for 1 year in full bearing			11½ cwts.

REMARKS.

Crop was lost in 1884, 1885, 1886 and 1887 from want of labour.

Tho Crop on Weld's Hill was thrown back by heavy pruning and unsuitablo woather for ripening.

Tho Crops for 91 will not decreaso theso averages. —*Madras Times.*

THE COMING TEA SEASON.

On the vergo of another tea season in China we may fitly look at the position of tea in that country, and its prospects here. A feature of the season now drawing to a close is that, owing to the decreased imports, the larger part of the diminished export from China has gone into use. Another feature is that the wholesale dealers are much opposed to hold stocks of any kinds, so that it has almost become a matter of compulsion for the merchants to hold their importations until the buyors actually require the tea for consumption. For these two causes the coming season will require an unusual amount of care on the par of buyers in China, and also from the fact the stock of tea in this country of all kinds will be reduced to an unusually small quantity—say to about sixteen millions of China tea, which is considerably lower than it has been for very many years, or perhaps has ever been before; and, if the export from tho East does not exceed that of last year there ought to be a fair chance of a good outturn; at the same time, if the quantity shipped is in excess of requirements, it will lead to a dragging market. The coming season will also require an unusual amount of care on the part of shippers, because the export having become now so diminished buyers may take a sanguine view of the prospect, and operate more freely than the actual requirements of the trade on this side would warrant. On no account must buyers overlook the fact that they have very strong antagonistic competitors in Indian and Ceylon teas, and it is daily becoming more apparent that China teas are losing their former monopoly of this market, owing to the depreciation in the quality of the various growths imported during the last few years; and in order to compete successfully with its rivals it is extremely necessary for all connected with the China trade to impress upon the grower the necessity of paying greater attention to the manufacture of his produce, and emulate the choice quality which brought tea grown in China so much into public favour. But of this later.

It is in the matter of preparation that we must look for good prospects in Chinese tea, and more particularly would we impress on Foochow dealers to give strict orders as to its manipulation. The slovenly way that they have been frequently prepared and sent forward has done much to account for the great annual decrease which is shown in the export figures. It has been rumoured that a few wealthy natives intend to purchase machinery for preparing tea, and set up an establishment for that purpose in one of the districts around Foochow. How much truth there is in the rumour we are unable to state, but we sincerely hope, both in the interests of the native and European, that the growers and dealers will not go on till they finally extinguish the trade ere seeking, and putting in force, remedies to arrest the decline: They may assure themselves that if they will only make good quality tea that they will be able to make hetter way against their rivals. China tea cannot and will not be completely driven out; for, given similar quality and price, there still remains a considerable section of the population who will always take it in preference to its rivals. The hardest foes that it has to meet consist of the prejudice against new methods and machinery for the better preparation; but in this way a Chinaman's pocket is being affected, and it may suffice to make him move. But he must move without delay. Foochow only requires a few more seasons of declining exports, at the rate of the last few years, to lose its trade altogether. The North is suffering, but not to the same extent. These better means of growth and preparation, so sorely needed, are even of greater importance than the imposts levied on the article by the Government, which likewise assist to strangle the trade and fetter its competition with the free article in India and Ceylon. Up to two seasons ago China could possibly afford to look on calmly at the diminished export to England, as Russia took what was over. Not so this last season, however, and we trust that now the figures have so materially altered, her foreign advisers will point out to her the double course of less taxation and greater care in preparation. Important as both these matters are, there is no doubt that the second is the more vital.—*L. and C. Express*, March 27.

NOTES ON PRODUCE AND FINANCE.

AMERICAN TASTE IN TEA.—The Philadelphia correspondent of the *Grocer* writes *a propos* of tea:—Cheapness, not quality, is the main consideration. It is incomprehensible—the taste of the American for the bitter, acrid-flavoured Japan tea. More than half the quantity used comes from Japan. We need not look for an increased consumption here until importers bring higher grades of tea, and that will not be done until the retail dealers know more about tea than they now do, and until some pains are taken to educate consumers up to an appreciation of body and flavour.

THAT REMARKABLE TEA.—As a climax to the advertisement obtained by the Mazawatte Tea Company over their purchase of tea at £12 10s 6d per lb., the company invited a number of people to taste the tea on Tuesday. That the infusion of these precious leaves produced a liquid of delicate flavour it is needless to say, but it is equally true that the palato of an expert is required in order to properly appreciate the beauties of this most expensive of luxuries. It is only necessary to say that some of those present declared that the parcel of tea was cheap at the price which was paid for it. The Mazawattee Company have refused to part with their purchase on any consideration.

CEYLON COCOA.—The chairman of the Ceylon Land and Produce Company, writing on the subject of Ceylon cocoa, says:—"It is curious to note that since the year 1887 the price of good red Trinidad cocoa has been gradually declining, from 78s. and 89s. to 66s. and 72s. per cwt., whereas that from Ceylon has been gradually rising from 70s. and 80s. in 1887 to 100s. and 133s. 6d. per cwt. for good red at present. There is no doubt that the beautiful pale chocolate colour it possesses, and its fine mild flavour have been the two principal factors in its being so much appreciated, and its taking the place which the Caracas variety held at one time. With regard to the extension of this product in Ceylon, you are, of course, aware that there is only a limited area where it can be grown successfully; furthermore, it takes from seven to ten years to come into full bearing, so that the present possessors of cocoa estates are very fortunate in getting the current very high prices, and which are likely to rule for some time to come. My company keeps up nearly 1,000 acres." Messrs. Frys, of Bristol, have made a speciality of Ceylon cocoa, manufacturing from it a fine quality of chocolate and chocolate creams. Specimens were exhibited at the Health Exhibition.—*H. & C. Mail.*

VEGETABLE PRODUCTS IN MALAGA.—In a report of the British Consul at Malaga, dated October 13, 1890, it is stated that the Cork, or Corkwood, as it is generally termed in commerce, which is produced in the province of Malaga, and more especially in the districts of Cortes and Gaucia, in the hill country of Ronda, is perhaps the finest and the best in the world, and is, therefore, eagerly sought and paid for at high prices. The Cork is stripped off the trees every ten years, that being the time required for it to attain the thickness sufficient for the purposes to which it is destined. Last year's production was a short one, as the turn for stripping fell to only a limited number of the plantations. The Vice-Consul at Garruelia says that attention has been paid in that district to the growing of scent-producing plants, and some plantations of the lemon-scented Geranium have been made successfully in Vera and in the Cabrera hills, where an experimental establishment for the extraction of the essential oils has been put up. The climate is specially suited to the growing of such plants aa those just mentioned, as well as Heliotrope, Gardenia, Lavender, &c., and wherever irrigation can be obtained, very large profits can be made in this way. Rosemary, Thyme, and a kind of Lavender (Lavandula Stæchas) grow wild upon the hills in considerable quantities. The Eucalyptus has been introduced for some years, and grows with marvellous rapidity wherever it can obtain moisture. It is sufficiently matured for use in timbering mines at seven years, and if successive plantations of seven sections, say, were made each year, they would begin to yield large returns from year to year after the first seven.—*Gardeners' Chronicle.*

A CHEAP COMPLETE FERTILIZER.—A mixture of acid phosphate, cotton seed meal, and kainit will make a complete fertilizer and of moderate cost, if used in the following proportions to form a ton:

1,200 pounds acid phosphate.
600 pounds cotton seed meal.
200 pounds kainit.

The acid phosphate should run 11 per cent. available phosphoric acid, the kainit should contain 12 per cent. potash, and the meal should contain 8 to 9 per cent. ammonia. This mixture will yield 8 per cent. of phosphoric acid, 1.98 per cent. of potash and 1.08 per cent. of ammonia, which is but a little lower then the average commercial fertilizer selling for $25 and $30 per ton. The ingredients and mixing of the formula should cost not more than $19 per ton, and possibly less, if the ingredients are carefully purhased. You may have to mash up some lumps in the kainit, but both acid phosphate and meal are always in fine condition for mixing. By mixing with hoes on a smooth floor the whole may be rapidly and easily mixed.—H. B. Battle. North Carolina Experimental Station Raleigh.—*Florida Agriculturist.*

WHITE PEPPER FOR BLACK.—We mentioned some time ago that a patent had been applied for for converting black pepper into white. The inventor is a Mr. Dunderdale, of Liverpool. The process requires a special apparatus, but, apart from that, the way in which it is done is this:—A liquor of soda ash is made—10 lb. to 1 cwt. of pepper. The pepper is stirred about in the hot alkaline liquor and left to stand until, on trying a sample, it is found that the colouring matter is dissolved off, or nearly so. The liquor which is of an almost inky-black colour, is now run off, and can be utilised for dyeing purposes. To the partially-bleached pepper is added a solution consisting of 84 lb. of chloride of lime to 250 gallons of water. When the seed has been sufficiently bleached this solution is run off and fresh water passed through to wash the pepper, after which the latter can be taken out and dried. It then closely resembles ordinary white pepper. The coloured solution, after being allowed to stand to remove all dirt, is decanted and treated with hydrochloric acid to precipitate the colouring matter, which may be sold for dyeing purposes. [We take this from *Discovery*, which seems to be unaware that black and white pepper are from the same plant.] —*Chemist and Druggist.*

GOVERNMENT RESERVATIONS.—It will be seen by the report of the proceedings of the Committee of the Ceylon Planters' Association that the planters of other districts are endeavouring to obtain from Government the same concessions as regards reserves along the streams passing through their estates that have been accorded to the planters of Udapusselawe. An admission of failure in the object for which these strips of land were reserved having virtually being made in the one case, it may be supposed there will be but little difficulty met with in the case of Ambagamuwa. We are under the impression, however, that the reservations in the one district differs from those in the other to a considerable extent. In Udapussellawa there was a reservation on both sides of the tavalam road that runs through the estates for miles; then there was a reservation along the cart road; and reservations along the course of streams. These different reservations intersected the estates and intersected each other in all directions, and proved extremely vexatious to everybody and the decision of the Government to allow them to be purchased by the estate proprietors has proved very satisfactory. We are not aware of any such network of reservations in Ambagamuwa, but do not for a moment doubt that those along the steams are in their way as vexatious as those in Udapusselawa; but the planters have not quite so strong a plea for their acquisition. That they are utterly useless for the purpose for which they are made we concede, but whether the Government will regard it in that light is quite a different matter.—Local "Times."

"CEYLON AND ITS GEMS."

We should like to know where the "Roving Correspondent" of the *Times of India* whose letter will be found below got his information in respect of the more important part of the information he tenders to his readers. He says that a safe and reliable estimate makes the annual export of gems from Ceylon in value about £10,000; and this, of course, means the annual gathering from the gempits, as very few of the actual finds are permanently retained in the island. The correspondent referred to quite understands that the Customs' returns cannot be at all depended on for the export of precious stones, so many being taken away—like the pearls from our present Fishery—on the persons of the owners, to India especially. In fact the large proportion of our sapphires, cat's-eyes, rubies &c. find their way out of the island without being reported; and we cannot help thinking that the estimate of £10,000 or R100,000 a year is far below the mark.

One test we have which it is surprising the correspondent and editor of the Bombay paper did not apply for themselves. The letter mentions—correctly enough we believe—that before the recent more stringent legislative restrictions, as many as 20,000 natives found employment or were connected with the gemming industry. Certainly this number is not above the mark, if the Rakwana district and province of Sabaragamuwa are considered, and also the Galle, Weligama and Matara districts in the South. Now, without counting the middleman's and exporter's profits, is it likely that 20,000 people, engaged for the greater part of the year in gem digging or hunting, are content with an average return of *five rupees per head per annum!* The idea is absurd. Our contemporary of the *Times of India* ought to have said that not £10,000 or R100,000, but £100,000 or R1,000,000 must, at the lowest, represent the annual find and export of gems from Ceylon, to entice and keep 20,000 Sinhalese more or less engaged in the digging and washing industry, apart from the host of relations, tamby pedlars, jewellers and other middlemen who make a livelihood out of gem selling and buying.

(BY A ROVING CORRESPONDENT.)

Tradition has it that the gemming industry was first established by a peculiar people called "Mookars," who were probably a race of Malabarese. They were under the control and guidance of a woman, called Mookery, and their efforts were so successful that within a short space of time they accumulated a large quantity of treasure, with which they loaded a ship and departed from the Island. But they were not destined to reap the fruits of their toil, for, having incurred the anger of an evil demon, their ship was, by his influence, totally wrecked, and the treasures were washed ashore and deposited anew in various directions. To this the natives attribute the fact that gems are occasionally found in the most unlikely places.

The most valuable gems found in Ceylon, and, particularly in the Sabaragamuwa District, are the ruby, the sapphire, and the cats'-eye—this last much prized by Asiatics and especially by the Malays. Stones of little value, such as garnet, moonstone, tourmaline, topaz, spinel and amethyst are to be had in abundance. The zircoon, in rich shades of brown, violet and green, with its members the grayish white and white jargoon, and the red hyacinth, is found in greater quantities than in any other country. It is here that the unwary globe-trotter has to be on his guard, as with the desire of becoming the envied possesso of a fine diamond or ruby, he not unoften becomes the prey of the designing "Tamby" or Moorman, who palms off as a diamond of the purest water a valueless zircoon, or as a ruby a worthless spinel, garnet, hyacinth or even quartz. It may be noted that a true ruby will scratch any of these counterfeits. Notwithstanding this abundance it is not possible owing to the system under which the industry has been worked to fix with any degree of accuracy the annual value of the gems unearthed. The Customs' registers are not reliable, for out of the many valuable gems found, some are retained in the island, and others are purchased for nominal sums by private persons and speculators, the real values of which are not, if ever known until they are disposed of in Europe or to some of the wealthy princes in India. A rough calculation, however, based on the best available data, gives the value of the precious stones found at about £10,000 annually.

The ruby is of most value, and has at times secured the highest prices. Rejecting as a traveller's tale the assertion of Marco Polo, that he saw a Ceylon ruby the size of a man's arm it may be interesting to recall what is related of another Ceylon ruby, in connection with the part played unwittingly, in the rise of a family that was of note in a subsequent period in the history of the Dutch Republic. A "Chetty" physician became the owner of a large ruby, said to have been the size of a small curry-stuff grinding stone. Cutting it into pieces, and retaining the larger portions, he presented the Dutch Governor of Colombo, Imhoff, with eighteen buttons set with the smaller pieces. Imhoff, not unmindful of gratitude, promptly exalted the donor to the proud position of first Malabar Mudaliyar of the Gate, a title of honour still retained, and about equivalent to a Lord Lieutenancy of a county in England. This rise in rank however stirring into restless action the dormant energies of the Chetty the Governor was at last glad to get rid of his protégé by transforming him into a dignitary learned in the law and presenting him with a seat as Judge of the Supreme Court in Java. This gentleman was grandfather to Dr. Quint Ondaatjee alluded to in Allison's "History of Europe," as the "Great Democratic Leader" &c. Whatever, however the value attached to the Ceylon rubies in the past or the present it should be noted that really valuable ones have ever been scarce and they cannot vie in comparison with some Burmese specimens.

Two of the latter were sent to London in 1875, weighing 37 and 47 1-16 carats. These were reduced after recutting by Mr. J. M. Forbes to 32 5-16 and 39 9-16 carats, respectively, and the former of them was sold for £10,000. What became of them eventually it would be interesting to ascertain, as possibly no single regalia in Europe contains two such fine rubies. Originally they belonged to the King of Burma, but impecuniosity and the chronic state of "hardup-edness" prevailing at that court led to their disposal. This was not an easy matter to achieve, for the people were proud of their possession, and resented the idea of their being sent out of the country. Strategy and military force were brought into play, and with a strong guard and amidst intense excitement they were conveyed to the vessel that was to bear them away to their destination.

In Ceylon, while really valuable rubies are rare, and sapphires common, the converse prevails in Pegu. Still of the sapphires a few splendid specimens have been unearthed, and mention might be made of one in the collection that was sent by the Colony to the Paris Exhibition in 1855, which was valued at £5,000. Notwithstanding the hardness of its nature, the sapphire can be beautifully engraved and in the Cabinet of Strossi in Rome, may be seen one, with the profile of Hercules, the work of Coneins.

The cat's-eye, too, is occasionally of some value, as instance the one that was in the collection of the last King of Kandy, which sold in London in 1820 for more than £400. This specimen measured two inches in diameter.

Though tradition speaks of the "Mookars" as the pioneers of the gemming industry in Ceylon, it is silent as to their methods of work. How far it resembled the practice adopted by the natives at the present time

of which an account is here furnished, cannot be known. The sites selected for prospecting are either the beds of streams or the dry land in their vicinity, and as the gemmer needs but few appliances, he is not handicapped by much initial outlay. These appliances consist of a few crowbars, a few mamotees, a long iron sounding rod, "Illankcore," and a close basket made of split bamboo reeds.

Thus equipped, the gemmer, if the site selected is the bed of a stream, commences operations in the dry season (December to March), when the water is low and sluggish. He first clears the sand away, and from time to time uses the sounding rod to see whether the gravel or "illan," hence the name of the rod, is accessible. In getting to this "illan," the matrix in which the gems are found, his efforts are sometimes retarded by impedimenta in the form of blocks of rocks, and invariably by a sort of crust, called "Cabook" which has to be penetrated, as it is commonly under this crust that the "illan" lies. On reaching this stage, and when the gravel is exposed, the coolies, who have hitherto been assisting the gemmers, are promptly sent away, as none but the initiated and those vitally interested in the success of the undertaking, are allowed to be present at the further development of the search. The gravel is now scooped out by means of the mamotees, and is deposited in the wicker basket, held under water with the feet. The basket thus secured, the "illan" in it is rotated with a quick motion, by which means the clay is dissolved and the lighter particles of stones, and, from time to time, the larger ones, if after due inspection they are worthless, are thrown out. The whole is thus reduced to what is termed "naboca," a thin heavy sand, mostly composed of particles of precious stones, which on careful security are secured.

Much similar to this is the process when the site for search is on dry land near a stream, the season for work being the same. Here the earth is removed to the level of the water, and when it becomes soft, the sounding rod is brought into requisition. So deftly is this used in the hands of an experienced worker, that he is seldom misled as to whether the "illan" is within practicable depth. The result being satisfactory, an anxious moment ensues, for the gemmer has to guard, with redoubled vigour, against an influx of water. The soft sand being removed, the "illan" is readily come upon, should there be no "caboca" to break through, and, by means of the crowbar, it is detached and heaped up for washing, either in the pit itself, if there is not much water in it, or in the adjacent shallow stream. To facilitate labour, the whole of the pit is not gemmed at once. Only one-half of the earth is removed, a flight of steps being constructed in the other half to expedite the removal of the earth and the baling out of the water. This half being exhausted, room is afforded for the earth on its removal from the remaining half, which is then in its turn operated on. The "illan" on being heaped up undergoes the process already described.

Simple and primitive as the process of gemming appears, it is in the majority of instances disappointing in the extreme, when the tangible benefits derived are compared with the great amount of labour involved. The sites and directions in which gems are imbedded are very uncertain and quite unknown, and though in some cases pits are workable in a few days, in others, days, months and sometimes years lapse before the matrix which contains these precious stones is discovered. But the reward of this may not be here, for the matrix may not yield a sufficiency of gems, even of the smallest value, to show a profit or even to cover the expenses. From enquiries the writer has instituted, it may be taken as substantiated, that of every ten pits sunk but one is found to pay. That, notwithstanding these facts, the industry should have been engaged in by the poorer class of natives, shows how hard a struggle for life they had to encounter.

During the reign of the Kandyan Kings when caste prevailed and was rigidly observed, for once a barber always a barber was the rule, the inhabitants of certain villages were exclusively set apart for gemming purposes. A body of hereditary gem men, with two headmen, also hereditary, to superintend the establishment was thus formed. This practice died out on the advent of the more enlightened and liberal British Government, and the gemming industry became open to all sorts and conditions of men.

For the past fifty years, the industry has been pursued by a number of poor people whose sole subsistence depended in very great measure on any little find. Others again, mostly agriculturists, resorted to gemming to eke out what the cultivation of "paddy" did not always afford them, so as to save themselves from absolute starvation. While so affording relief, a system of joint-stockery on a small scale, between expert gemmers and landowners, introducing speculation into it, gradually crept in. In course of time the attention of European speculators, forming themselves into companies, was drawn to it, leading to the investment of larger capital.

Up to the time of the formation of these European companies, the natives were unrestricted in their efforts at gemming, the only places they were not allowed to exploit without licenses being Crown waste lands. The advent of European capital caused the Government to step in, in the early part of last year, with the enactment of an ordinance, that with one fell swoop did away with all the privileges hitherto enjoyed by the indigenous population. The features of this ordinance may be briefly summarised. It enacts that a fee of R5 is payable for a license for every pit opened in *whatever locality*, the number of men employed on each pit being fixed, for each of whom a sum of 75 cents., or 12 annas, for a term of three months is due. A specially hard feature lies herein, for if the number of persons when the license is issued should be 26, and 27 happen at any one time to be employed, the license can be cancelled by Government, and each extra man so employed may be fined R50, or in default undergo six months' imprisonment.

That this is a most unreasonable clause should be apparent to the most unthinking mind, and its execution has had the effect of preventing the poor people to the number of 20,000 from in any way devoting their attention to gemming. It not unfrequently happens that with a sudden influx of water into the pit an increased strength of labour is absolutely necessary for baling purposes if all the efforts already put forth are not to be frustrated. As has been shown, any excess of labour involves a heavy penalty, unless it has been duly applied for and a fresh license obtained, a matter involving a delay of, say, four days, if not more, as a number of formalities have to be undergone, including the drawing up of a report as to the altered circumstances of the pit, by the village headman, an *unpaid* native official.

The ordinance appears to have been drafted on the assumption that the Crown, as successors to the Kandyan Kings, has a prerogative right to gems, *even on private lands*. That such a right was ever exercised by those sovereigns is doubtful, and is not clearly established. It is at all events remarkable that the claim now put forth should have been lost sight of for a long period of years, and that it should now only engage attention.

But not content with these rights, the Government goes further and seeks to establish similar ones on lands which it itself previously *sold expressly as gem lands* for high and fancy prices. These lands were sold outright to the present owners, and that they should be called upon to render to Government a share of the gems found is opposed to every sense of political morality.

Another objection to the ordinance, and a potent one too, as it involves a clear breach of faith, is that the tax is enforced on lands belonging to Buddhist temples, and on the villages of Kandyan Chiefs, who assisted the British power in taking the Kandyan provinces, whereas by law these lands were declared *free* of all tax.

That the ordinance is felt as an extreme hardship by the people, leading them to transmit a temperately worded memorial to the Secretary of State for the Colonies, detailing their grievances, is not to be wondered

at, and sympathy cannot but be felt for them in their attempts to gain redress. The ordinance as it stands has practically killed the *native* industry, and leaves it for the present in the hands of the European speculators who have come on the scene. The *raison d'être* of it really appears to be, that if capital can be invested freely by foreigners, there must be something enormous to be made out of the industry, and so the Government thinks fit to have a share. But the question remains to be solved whether the introduction of European capital, aided by the most improved appliances and the latest methods for working gem mines, will develop into a remunerative business. There is nothing in the past to warrant such a belief, and when it is remembered that gemming has been openly carried out for years, openly and immediately under the eye of shrewd British business men, its success, handicapped as it is by an initial tax of 10 per cent, under the newer auspices, is, to say the least, highly problematic.

Ratnapura and Rakwana are the places where the best gems are found, though along the road I remarked several excavations where gemming had been conducted. Some very pretty moonstones were shown me, which however were of little value. From Palmadale to Rakwana is a distance of sixteen miles up among the mountains. At one side is a deep valley heavily timbered and matted with luxuriant creepers. I noticed some curious orchids, with strange pendulous flowers, hanging from the angles of branches: their stems were covered with fungi of the most gaudy colours —bright red, yellow, and purple. The scarlet shoots of the iron wood tree seemed like flowers in their blood-red hue. Part of the hill side was literally a blaze of crimson, looking as if the wood was strewn with vermilion. This wood abounds with game, wild boar, elk, red deer, black faced monkeys; and the whirr of copper wings indicated flocks of parroquets without number. Rakwana is a mining village, consisting of one long street, and looking absurdly small owing to the presence of some massive iron wood trees and tall palms which dwarf the little huts at their base. No more than 250 families reside here under the shadow of a big brown mountain with huge irregular spurs. Down the side of this mountain trickled a stream which fell over a rough bed of stones in a succession of small cataracts, until it got down to the valley when it slipped along in a placid stream. It looked like a frayed string of braid lacing the side of the huge mountain. One side of the hill was covered with matted jungle and the other placed under cultivation. The view higher up among the glens was inexpressibly fine. The twin wooden shanty of the planter stood out on the hill side, while the green tufts of tea hardly showed on the red brown earth. Down in the valley, the hills appeared like miniature hay cocks, under an amethyst sky of the loveliest blue. The beauty of this scene viewed from the glen where the evening operations take place was lovely, and pathetic in its loveliness. The plaintive note of a bulbul, who is supposed to have a passion for the rose and regrets seeing it plucked, communicated a feeling of sadness to my mind as I looked down from those lofty peaks into the distant valley. There is not a dog hole of the European continent that I have not visited, yet a finer view than the one before me I never witnessed.

The miners are an improvident lot, tunnel diggers getting an average of R2 and a half a day. I had a talk with Mr. Bradley, the Superintendent of the Ceylon Gem Company, and was courteously led round its pits by Mr. J. H. Smart, his assistant, a pleasant, genial, and highly informed gentleman. Here I heard a great deal more of gemmers and their hard lives than I can insert in this article. I trust, however, I have given my readers some idea of gemming in Ceylon to enable them to form a conjecture whether they will find it worth their while to invest their money in such lottery concerns.

Above, we publish a lively and entertaining paper upon "Ceylon and its Gems." Our "Roving Correspondent" seems to have studied the question with some care, but it is startling to learn that according to the best available data the value of the precious stones found in the island does not exceed £10,000 annually. The introduction of the new ordinance or tax has, we are told, killed the mining industry altogether, so far as the natives are concerned, and left it for the present in the hands of European speculators. The question, says our correspondent, remains to be solved whether the introduction of European capital, aided by the most improved appliances and the latest methods for working gem mines, will develop into a remunerative business. "There is," he adds, "nothing in the past to warrant such a belief. and when it is remembered that gemming has been openly carried out for years, openly and immediately under the eye of shrewd British business men, its success, handicapped as it is by an initial tax of 10 per cent., under the newer auspices, is, to say the least, highly problematic." None of our Indian readers are however, at all likely to put their money into the gemming industry of Ceylon, while the grievances of the native miners may be safely left to local public opinion. It is of much more interest to read the words of wholesome warning addressed by our writer to travellers anxious to invest in diamonds or rubies, and to learn what manner of inferior stones are often palmed off instead of them. The safest stones to buy in Ceylon are sapphires and cat's-eyes, but even with regard to these the assistance of an expert is desirable. Considering the thriving business done all the year round at Colombo, and especially with Australian passengers, it is at once a surprise and a warning to learn that the annual value of the gems found on the spot is not more than £10,000. What, we wonder, is the value of the annual sales?—*Times of India.*

LIBERIAN COFFEE AT THE STRAITS.—As already mentioned, Dr. Trimen has returned from Java and the Straits confirmed in the conviction that we in Ceylon have been too hasty in discarding Liberian coffee. In this connection we call attention to a statement and figures in our *Tropical Agriculturist* showing crops in the Malaya peninsula (Selangore and Sungei Ujong) averaging from 8 to 11½ cwt. per acre, returns handsome enough to induce a wide extension of planting. Ceylon has, of course, a far poorer soil, but there are parts of the Western and Southern provinces especially where Liberian coffee might well be planted, by the natives especially, with advantage.

KADIRANA, April 13th.—No shock of earthquake has been felt in this neighbourhood, but thunder-storms and occasionally heavy gusts of wind have been experienced. The north-east is bent upon going out with some bluster. From the 6th to the 10th there was rain in the evenings; the total fall being 2·28 inches. The mornings, are delightful but the days are close and very trying. Growth of vegetation has been rapid for the last two months which will much benefit the cinnamon bushes, and permit of work being begun for the new season (1st May) early. I was much pleased to see Mr. Gladwin's letter, in Saturday's *Observer* on the increase of opium consumption in Ceylon. I have been greatly surprised at the number of opium-eaters I have come across in this locality; and from inquiry I find that opium-eating is becoming common among the Sinhalese. The usual reason given for its use is to relieve aches and pains; and when once taken to, the unfortunate victim has not the courage to give it up. Fortunately in this connection most of the people are too poor to indulge to any serious extent. As in the case of arrack I think the Government is greatly to blame, when, for the sake of a paltry increase to the revenue, it gives encouragement to the extended use of this drug—a boon to humanity when under medical control, but a fearful curse when it can be sold to the ignorant and confiding in the bazaars. These poor people imagine they have found a panacea for their ills, and find when too late that they have only added another and a worse one to the list.

A CUPPING INSTRUMENT FOR SNAKE BITE.

[From a number of the Cape *Agricultural Journal*, we take the following very valuable, commonsense information on the use of a cupping instrument for snake bite. Speedily and effectually applied so as to retract the poisoned blood, no better remedy could be used. In the recent case of poor Bosanquet, in Florida, his companion bravely did his best by sucking the wound. But the venom had got into the circulation through the veins in the *inside* of the foot. Had the bite been on the outside the sucking might have been effectual.—ED. *T. A.*]

Snake poison is now ascertained to be a definite chemical compound, perfectly stable and indestructible, except by anhydrous sulphuric acid, permanganate of potash, and partially by carbolic acid, in fact, by those few substances which decompose and destroy any organic chemical. Ammonia has no effect upon it; for when the poison is mixed with ammonia and injected into the bodies of animal, it retains its energy unimpaired, but it is certain, from South African experience, that ammonia, especially taken internally, probably as a nerve stimulant, counteracts its effects.

There are two kinds of snake poison, the colubrine of the cobras, and the viperine of the vipers or adders. The former is chiefly a nerve poison, and produces paralysis, especially of the respiratory nerves. It kills by causing carbonic acid poisoning, which is accompanied by convulsions. The viperine venom is both a nerve and a blood poison, the latter action being often the more dangerous of the two. The puff-adder is our best known viper.

As snake poison is of this stable and indestructible character, according to the dictates of common sense the first consideration is to get it out of the body, whatever the value of antidotes may be. Dr. Wall, who at the instance of the Indian Government carried out the experiments of Sir Joseph Fayrer to more definite results, is of opinion that nothing will save life in persons bitten by Indian snakes, except making a cut across the side of the bite, and dissecting out the subcutaneous tissues in which the venom is lodged a sixth of an inch or more beneath the surface. Our South African snakes are not quite so venomous, and no one but a skilled surgeon would venture on such cutting and carving. Another plan, therefore, seemed desirable. A good many cases have occurred where life has been saved by sucking out the venom with the mouth. This suction, however, is feeble, and is also highly dangerous if there happens to be any skin wound in the gums or mouth. The proper thing would be a strong cupping instrument. The ordinary cupping instrument is unsuitable, from the glasses being too wide in the mouth. It is also too dear for common use. That of S. Maw & Son London, is 22s. to the trade, and would be at least 30s. retail price. It seemed to me that nothing would serve but an instrument prepared expressly for snake-bite, and sold at about half a guinea. I accordingly induced Mr. William Hume a well-known scientific instrument maker, Lothian Street, Edinburgh, to prepare such an instrument, giving him an exact description of what was wanted. He produced one which is thoroughly effective. The barrel is of brass, about five inches long by ¾ inch wide, with double valves and a bell-shaped glass ⅝ inch wide at the mouth, and enlarged above so as to hold an ounce of blood. The suction is powerful. A larger glass may also be had at an extra charge, with the mouth an inch and a half wide, for animals. The instrument is sold in Edinburgh at 10s. 6d. What with Customs duty, carriage, and commission it could hardly be sold for less than 15s. in this country, unless an importer were to order six dozen, in which case there would be a reduction of 20 per cent. Still, the price is very moderate, considering that snake-dite antidotes are sold at from 8s. 6d. to 12s. 6d., and are suspected of not keeping.

Treatment of Snake bite.—The thing to be done immediately, on a person being bitten, is to cut off the circulation from the part so as to prevent the venom from being absorbed. The best thing is an india-rubber band or rope, similar to Esmarck's bandage, either solid or tubular, and strong but flexible. This should be wound firmly and a number of times round the limb at the part next above the bite. As this band fits itself to depressions in the bone, it is far more effective than whip-cord even were it made so tight as to cut into the flesh. A soft reim is the next best, but anything, even a handkerchief, should be used in an emergency. The next thing is to probe the two fang punctures with a sharp penknife or lancet. Scarifying is a mistake. It merely removes the superficial blood, while the venom remains lodged in the tissues. The proper thing is to open up the punctures so as to get down to the venom, and secure that it and the envenomed blood is sucked out. The probing being done, the mouth of the cupping glass should be moistened and pressed down firmly over the wound so as to allow no air to get in at the edge of the glass, and the piston worked up and down. The flesh will be sucked in, and the glass will soon be filled with blood. This may be repeated. If the cupping is performed before the poison has gone into circulation, there is every reason to expect that life will be saved. Even if all the poison is not removed, life may be saved, for snake poison does not kill unless it goes above a certain proportion to the entire quantity of blood in the body. The antidote, which should be administered internally at the first, may now be applied to the wound after washing it with Condy's fluid (a solution of permanganate of potash), if it is at hand. * * *

[Then follows a notice of an antidote in the shape of tincture of a herb, the red or wild Dagga, *Leonotis leonurus*, but ammonia alone is probably best.—ED. *T. A.*]

Directions for using the Cupping Instrument.—The instrument should be kept in a place known to all the household, and ready for immediate use. To keep it in perfect order, it should be examined periodically. In testing it, apply it to the chin or any fleshy part. If it does not work that may be from want of oiling the piston, or because the valves are wrong. The oil, should be sweet or olive oil, or else an animal oil, quite free from acid, so as not to corrode the brass. As oil dries up, the oiling requires to be repeated now and again.

To reach the valves, unscrew the milled edge at the lower end of the syringe for the one valve, and screw off the bottom plate of the piston for the other, using if necessary the two small holes to keep the upper part firm. The valves may require simply to be wiped from oil or dirt. If a valve requires renewal, that is a very simple matter. It is a strip of oiled silk (the umbrella article, or that sold by druggists will do) put over a small hole, with its ends tied over a groove in the brass by means of a thread. The packing of the piston can also be easily renewed. It consists of a round piece of leather, steeped in sweet-oil, with a hole in the middle through which the screw of the bottom piston plate passes, and the sides are then folded up—an arrangement easily understood on inspection. The instrument, which is a substantial article, is practically indestructible, and as they are all made exactly alike, glasses and other parts could be replaced for that matter.

The sample instrument in my possession was shown to Sir J. Gordon Sprigg, and as he approved of it, he gave an order home for six dozen. They have probably come by this time, and may be at the disposal of the Colonial Secretary. The intention, I suppose, was to place them in the hands of magistrates or other public officers, so that they might be seen by farmers and others in the rural districts, besides being used. No farm-house should be without a cupping instrument for snake-bite: puff-adders and other snakes are so numerous, and there are so many children, servants, cattle, horses and dogs liable to be bitten. The cupping glass will also be serviceable for the sting of the scorpion, the bite of the tarantula, the stings of wasps, and if applied at the moment, for poisonous blood or matter getting into a scratch.—ANDREW SMITH.

NOTE.—The cupping instruments have come, and a set will be sent on application to any Civil Commissioner or qualified medical practitioner. I may add that it has for a long time been my habit, in travelling, to carry, in my pocket, a small glass funnel for use in sucking the puncture in case of a snake bite. This, of course, does not act so powerfully as a cupping instrument, but has the advantage of being small enough to be easily carried in one's pocket.—EDITOR.—*Agricultural Journal.*

POULTRY NOTES.

Change the straw or hay in the nest boxes frequently.

In shipping fowls give them plenty of room, but make the coops as light as possible. Express companies have no souls and rates are high, and all we can do is to protest and pay.

It is only necessary to examine a chicken's crop to ascertain that a good variety of food as well as bones or gravel is essential, and ordinarily a good supply of a variety of food will be found much better than any kind of medicine.

Bran is excellent for poultry, but the hens care but little for it unless scalded. To make it "stick," add a handful of linseed meal to every point of bran. The two substances are an excellent combination, and will greatly aid the hens in producing eggs.

Do not be tempted to keep a cock that is not a thoroughbred, or that is related to the hens, no matter how promising he may seem. Change the cocks every year, and the flock will gradually improve in vigor, resulting in a greater number of healthy chicks, as well as an increase in the supply of eggs.

The coarse grain so universally fed to poultry is both expensive and unprofitable; being swallowed hurriedly and often in unwise quantities, it frequently produces indigestion or other serious disorders. A mixture of four parts of wheat bran to one of meal is what I feed, with signal success and satisfaction to both laying hens and growing chicks.—*Florida Agriculturist.*

ORCHID HUNTING

appears to be a fine adventurous sport—not so exciting, perhaps, as Waterton's snaring of the caymans with baited hooks in the great rivers of Brazil, but getting on that way. Unfortunately, the most prized of our orchids are reported to be rapidly disappearing from their native places. According to the "Journal des Orchidées," in the environs of Pacho (Ecuador), where hundreds of thousands of specimens of the *Odontoglossum Alexandræ* have been collected, only a few plants are now left. In other places where it once flourished, it has entirely vanished. Though not in the true sense of the word a parasite, this beautiful plant prefers to grow upon the trunks of trees, which the natives dread to climb on account of the scorpions and stinging ants. Hence the practice is to fell the huge tree, with the frequent result that no orchid is found. The hunters, it is stated, separate into parties of five or ten, and disappear for a fortnight in the dense South American forest, relying for food in great part upon their guns, and sleeping at night in hammocks. When sufficient specimens have been collected they are cleaned, wiped dry, placed carefully in crates on the backs of mules, and thus carried to the point of embarkation—Honda—on the river Magdalena. The journey occupies at least five days, even if the party are lucky enough to escape the frequent tropical rains which convert peaceful brooks into raging torrents. Sometimes it is found necessary to throw temporary bridges over these suddenly swollen water-courses and to carry the crates across by hand, while the mules, relieved of their burdens, swim across as they best can. The withering torrid heat is the greatest difficulty.—*Public Opinion.*

PADDY AND DRY GRAIN CROPS IN CEYLON.—From the Abstract of Season Reports for March 1891, published in the latest *Gazette*, we learn that in the Colombo district the condition of the paddy crops was good generally, with the exception of portions of Siyane Korale West, where recent rains had done some damage. It is also stated that "there is no distress or want of food anywhere, and the health of the district is on the whole good." In other parts of the Western Province also the prospects were favorable. In the Central Province, on the other hand, the paddy crops in the Kandy district were reported as generally poor; while the kurakkan crop, where cultivated, was only fair. In the Matale district, however, the paddy crops, where they were in existence, were "much benefited by recent unexpected rains." In the Nuwara Eliya district paddy and kurakkan were only fair or poor, owing to poverty of soil and drought, except in Kotmale, where the paddy crop was good. With regard to the Northern Province, the report from Jaffna on the paddy crop was:—"Reaping throughout district completed. Crop on the whole good, though there has been failure in some villages as already reported." And on kurakkan:—"Good crop expected owing to benefit by rain." It was also added:—"Tobacco in some places cut—prospects of a very good crop." From the other districts of this province the reports were not very satisfactory; the dry grain crops seem to have been better than the paddy. In the Southern Province good showers had fallen, and the prospects generally were favorable. From the Batticaloa district of the Eastern Province it was reported:—"Prospects of grain crops most favorable. Harvesting of early munmari proceeding, and very extensive cultivation for kallawellamai in progress. The new paddy one rupee per bushel. Supplies of vegetables and Indian corn abundant, and cheap. Indian corn 75 cents per bushel. Manioc unsaleable though offered at 50 cts. per cwt. Plenty of water in tank, and rain at intervals." In the Trincomalee district progress was slow on account of cattle murrain. In the North-Western Province rains had fallen, but too late to do much good, except in the Wanni and Chilaw. The tobacco crops in the latter division were excellent. From the North-Central Province the report was: "Partially distributed rain filled some tanks in east, west, and south of Nuwarakalawiya. Maha crop nil owing to drought, except in Kalpe korale and a few villages of Nuwaragam palata. Chenas partially revived by recent rain. Kurakkan crop generally middling. Abnormal rainfall in Tamankaduwa. Maha crop, where cultivated late, good. Chenas average half crop, and being reaped. Drinking water bad, and scarce in many villages." In the Badulla district of the Province of Uva the kurakkan and Indian corn crops were fair except in Buttala, where excessive drought had made the hên poor. In the Province of Sabaragamuwa the crops and prospects were generally good.

THE JAMAICA EXHIBITION:

WHY NOT A COSMOPOLITAN EXHIBITION IN CEYLON?

(*From the Hills.*)

It is surely curious that whilo it is now about a week since the special illustrated edition of the Jamaica *Gleaner* reached here, with a full account of the opening of the Exhibition at Kingston by Prince George of Wales, as the representative of his royal father, the Prince of Wales, no notice of the event has as yet been taken by the English press, judging from the negative evidence of extracts in the *Tropical Agriculturist* at any rate. You are, no doubt, waiting for the promised account by Mr. Wm. Sabonadière, the only mention of whose name in connection with the ceremonies and festivities is the statement that, at a grand fancy ball given by Sir Henry and Lady Blake, he appeared in the character so dear to juveniles, of Santa Claus. The Governor himself appeared as Columbus, the discoverer of the Caribbean Island, while Lady Blake personated Queen Isabella, to whom the great navigator wrote such a glowing although not an exaggerated account of the beauty and natural resources of his discovery. At the ball the Governor is described as specially seeking out a lady, Miss Espeut, who, he understood, appeared as Jamaica. Some of the portraits given by the *Gleaner* are fearful and wonderful. For the males it does not so much matter, but we hope less than justice is done to the accomplished Lady Blake. She is sister of the Duchess of St. Albans and daughter of the late Mr. Bernal Osborne, famed for his caustic wit, which was so irrepressible, that, when he took office, he could not refrain from using it at the expense of his colleagues, and so had to resign. Jamaica has to thank the snobbishness of the Queensland democracy, who protested against a Governor who began life in the Irish Constabulary, for being at present ruled by one of the ablest and most active men amongst the list of Colonial Governors. He has worked incessantly to make the Exhibition a success, not only as a spectacle, but as a means of making the colony and its productions better known and so increasing its commerce. The only unpleasant incident we see noticed is in connection with another exemplification of the fact that democracy can degenerate into snobbishness. Mr. Blaine, who does the offensive policy of the United States, pretended that his country had been slighted because not specially invited to take part in the Exhibition. Sir Henry Blake showed that precisely the same invitation went to the United States as to all other countries. But this does not content the blatant Blaine, whose every effort is directed, by means of tariff distinctions, to force Canada and the West India Islands into "the Union." Although Sir Henry Blake is not himself a lord, and was, therefore, unacceptable to the Queenslanders, his Private Secretary is Lord George Fitzgerald, brother of the Duke of Leinster. The *Gleaner* describes the Exhibition as "a splendid success which will inaugurate a new era of advancement and prosperity for Jamaica." There is room for improvement, for the journalist states :—"In manufactures and even handicrafts our people are very children. In agriculture we are little further advanced than we were two hundred years ago. Literature, Science and Art are unmeaning words to 999 out of every thousand amongst us." It is added :—

One good at least, if none other, the exhibition should do and that is to give the lie to those unworthy sons and residents who are perpetually decrying everything of home growth, believing in nothing that is "creole" and taking a strange pride in uttering their loud contempt of everything Jamaican. The motto of these people has always been that nothing good could ever come out of Jamaica. They have preached it from pulpit and from press, they have dinned it into the ears of foreigners, taking as strong a delight in shewing up the weak points of the people and the country as some people do in harping on their own maladies or as a Neapolitan beggar in displaying his festering sores. The Exhibition will prove these people to be miserable carpers. It will show our own people what can be done in Jamaica by persistent energy, by united effort. It will nerve many to other achievements longed for for many a day but looked on as almost hopeless of attainment in Jamaica. If a great World's fair is possible in Jamaica, why not docks in Kingston Harbour? Why not a seawall on the harbour front? Why not nicely paved streets with commodious sidewalks? Why not a thorough system of drainage? Why not central factories? Why not smiling vineyards? Why not a network of railways over the Island? Why not in short a thousand and one things that we have been slumberously content to do without, while the great nations of the earth have for years past looked upon them as necessaries of life?

Now if a World's Exhibition has been a splendid success in little Jamaica with only 600,000 of population, and most of them only emerged from slavery, surely the question arises and ought to be answered, why Ceylon, with her three millions of population, her central position in the eastern world, and her grand harbour, the resort of mail and merchant ships, with passengers and tourists from all parts of the world, should not attempt an Exhibition of her own, inviting all the countries and peoples of the world to take part in it? Will the glory of having initiated, matured and carried to a successful issue so great and so undoubtedly beneficial a design fall to Sir Arthur Havelock? Will our Governor do for Ceylon what Sir Henry Blake has done for the tropical island of the western hemisphere? There is more good work to be done and more of legitimate fame to be earned in carrying out such a design than in tampering with sources of revenue, prescriptive in their nature and, however objectionable in the light of western ideas, quite consonant with eastern customs and eastern notions. The Ceylon Exhibition, if carried out, could so precede the great World's Show at Chicago that most of the exhibits might be transported to the western world, after having done duty here. The effect on our staple product of asking all the world to come and see it in the place of its origin cannot but largely help the efforts that are made to render it acceptable by sending specimens to the various countries of the world. Submitting the idea to readers of the *Tropical Agriculturist* from the Governor and Lieutenant-Governor downwards, we proceed to notice a few further points of interest connected with the Jamaica Exhibition. The only qualification noticed in connection with the opening of the Exhibition is the comparative failure of the electric light contractors to illuminate the building fully at night. Besides the great domed building, there are 23 acres of grounds laid out with tropical and other plants. Canada, which is competing with the United States for the trade of the West Indian Islands, occupies a commanding position in the collection of exhibits. A trophy of the finest woods of Quebec, in the form of a castellated wall, had to be erected in the grounds, as it was too large for the interior of the building. Admiral Watson and the officers of the British Fleet which accompanied Prince George added greatly to the effect of the show (the warships were

lluminated at night); while Major-General Clive, Justice and the officers of the Army, Militia and Volunteers were not behindhand. Limited as space in the *Tropical Agriculturist* is, we must make room for the following editorial remarks:—

When the public look at the diagram exhibited by the Jamaica Institute, showing the cane lands cultivated in 1790, the chief of the so-called "palmy days" of old, and turn to the companion diagram showing the cane lands cultivated today, they will see some reason for writing of a *new* Jamaica. Whether a better or a worse is not the question. When they turn to another diagram showing the extent of the small holdings at this date, and remember how few they were a century ago, they will be still more convinced that the Jamaica of today is a very different thing from what it was. When they turn again from these things to the educational and other statistics that indicate material, intellectual, and moral advancement, they will have before them proofs of a change amounting to a revolution that has not been all the circumstances considered, anywhere exceeded within the same number of years. It would be easy to point out in history many great and remarkable changes, but those who try will find it hard to point out one that exceeds in interest what has been effected here. It took that master lawgiver Moses more than his own life-time to build up a nation out of the oppressed Israelites. He did, however, good and lasting work. He made a people as enduring as granite. The modern lawgiver, the British Parliament and Executive, instructed by the British People, did a similar creative work, when during fifty years previous to emancipation they abolished the Slave Trade and watched jealously and carefully over the rights of the slaves, and when for the fifty years that followed they watched with equal care over the interests of the emancipated people. The result is the strong, growing *new* Jamaica that has made an Exhibition possible here, and is going to make it a success. This newness, with its assured continuance, is the great fact that should attract the attention of our more thoughtful visitors.

There is another new thing connected with Jamaica. The character of its scenery is not new. So far from that, it is as old as the hills. But the recognition of it and of the character of the climate is new. As Sir Walter Scott was said to have discovered Scotland in respect to scenery, so recent travellers have been discovering the truth, of the Governor's words, that Jamaica is one of the loveliest islands in the world.

What is anticipated for Jamaica might well be realized in the case of Ceylon, in the resort of visitors who desire to escape from depressing cold to genial warmth:—

If those who have eyes to see and natures fitting them to enjoy what is beautiful in scenery will in twos or threes make a leisurely journey from Kingston to Lucca *via* Ewarton and by way either of the interior or the coast road, they will see in this month of January what will astonish them if they come from cold and leafless England or Canada. To transport in a day or in fourteen days a dozen Englishmen or Canadians to St. Ann's, Trelawny, St. James, or Hanover as they now are, would be a great surprise to people who think of us as sweltering under tropical heat, surrounded by parched fields, and hardly able to bear up under the burdens of existence. They find themselves in a garden, driving along main roads as smooth and pleasant as any in the world, where the scars made by pick-axe or shovel are soon healed, and nature all round wears a robe of riches and most varied green, and where the forms as well as the colours of plant life are strikingly attractive and beautiful. When they thought of what they had left behind of the cold and the nakedness of the land, of the struggle in the part of thousands to keep up the fire in the "living stones" which every animal body is, they might well think that they had come to winter in paradise. The thought would be literally correct. Some of our present visitors will, when they go home, say so, and come back often and send others.

CEYLON PLANTERS' AMERICAN TEA COMPANY.

TRANSFERENCE OF BUSINESS.

THE TRADE WITH AMERICA.

At noon of April 9th, a meeting of the Ceylon Planters' American Tea Co., Ld. was held in the registered offices of the Company (Darley, Butler & Co.'s) 9, Queen Street, Fort, Colombo. Mr. L. H. Kelly presided, and the others present were the Hon. J. J. Grinlinton, Messrs. V. A. Julius, A. H. Thompson, E. B. Creasy, H. Whitham, J. F. Headrick and W. W. Mitchell, by his attorney Mr. J. F. Headrick. Mr. Grinlinton had proxies from Messrs. G. Ross, Le Vallon, Pussellawa, and James Westland, Gammadua, Rattota. After the approval of the minutes of the previous meeting,

Mr. KELLY explained that at the last general meeting it was decided by the shareholders present that the best course they could adopt was to accept the arrangement which had been made by the Hon. Mr. Grinlinton on behalf of the Ceylon Planters' American Tea Co. with the new Company in America—the Ceylon Planters' Tea Co. It was thought most advisable that they should hand over their old Company to this new Company who were prepared to undertake it. That was the feeling of the shareholders at the last meeting, and it was then left to the directors to arrange all the preliminaries. The directors had done so, and this meeting had been called to endorse their action, to declare the winding up of the old Company and hand it over to the new Company. The shareholders were perfectly well aware of the reasons which had necessitated this step, and he could only hope with his brother directors that the step which the shareholders had taken was a wise one and would not only lead to the furthering and pushing of Ceylon tea in America, but also turn out a profitable speculation for those who are interested in it. (Hear, hear.) After reading the formal resolutions which it was necessary to pass, Mr. Kelly proceeded to say that the directors this morning went through the list of defaulters and had decided to forfeit the shares of those who had not paid up. Where, however, the slightest doubt might exist in the case—for instance, of men absent from the country—the directors had arranged to give these men a certain amount of time because being absent it was just possible that the notices had not reached them. With regard to the arrangement made by Mr. Grinlinton that interest at 9 per cent should be paid up to 1st October 1890, the directors had arranged that the interest should be paid at once, and would be paid forthwith. In answer to a question he said the only difference in the name of the new Company compared with the old was that the word "American" was left out.

It was then unanimously agreed on the motion of Mr. CREASY seconded by Mr. JULIUS:—"That the Ceylon Planters' American Tea Co. Ld. be wound up voluntarily."

Mr. THOMPSON moved and Mr. WHITHAM seconded:—"That Messrs. J. J. Grinlinton and James F. Headrick be appointed liquidators of the Company, and that their remuneration be at R500 each."

Mr. KELLY pointed out that the offices of the Managing Director and Agents and Secretaries would cease as soon as the Company ceased to exist, but a very large amount of work would remain to be done in the way of settling matters generally, and remuneration to the gentlemen who did it was a matter of course. They could not expect them to undertake the work of winding up the Company and all the trouble connected therewith, without giving them remuneration.

The resolution was adopted unanimously, as was also the following one, which was proposed by Mr. CREASY and seconded by Mr. THOMPSON:—"That the assets of the Ceylon Planters' American Tea Company, Ld., be transferred by the liquidators so appointed to the Ceylon Planters' Tea Company in terms of the agreement of the 15th Sept. 1890."

The Hon. Mr. GRINLINTON suggested that the quantity of tea sent out might be mentioned.

Mr. KELLY said that since the Ceylon Planters' American Tea Co. had been set on foot and working it was satisfactory to feel that they had been doing something at any rate towards advertising Ceylon tea in America. From the date they commenced sending out tea up to the present moment they had sent 70,146 lb.; and although that might appear a small amount for so large a Continent, it must still bear some fruit. It was quite evident that 70,146 lb. of tea sent to America must make Ceylon tea known to a very much greater extent than it was before, and they could only express the hope that it would do so. Direct information had not been received from the American Tea Co., but indirect information which he had, rather from London sources than here, was that the Company in America were extending their agencies considerably and hoped to do a very good business in Ceylon tea.

The Hon. Mr. GRINLINTON added that the figures quoted by Mr. Kelly showed only the quantity of tea that was sent direct from Ceylon and did not include the quantity sent from the London agents of the Company of which they had no record at present.

Mr. CREASY believed it was in the power of the directors to have enforced the calls on the shares that had now been forfeited.

Mr. KELLY said he would leave Mr. Julius to speak as to that.

Mr. JULIUS said that notwithstanding the forfeiture of the shares it would be seen by the articles of association that the shareholders were still liable. In section 33 it was stated—"Any shareholder whose shares have been so declared forfeited shall notwithstanding, be liable to pay, and shall forthwith pay to the Company all calls, instalments, interest and expenses owing upon or in respect of such shares at the time of the forfeiture, together with interest thereon from the time of forfeiture until payment at 9 per cent per annum; and the directors may enforce the payment thereof if they think fit."

Mr. CREASY queried:—But the Company being now at an end they will not now be liable?

The CHAIRMAN:—Oh! yes.

Mr. CREASY:—Although the Company is now dissolved?

Mr. WHITHAM:—The liquidators have power to enforce it.

The Hon. Mr. GRINLINTON:—But would it be judicious? Might not the forfeiture of shares be absolutely sufficient punishment? He did not know any Company—and he had known a good many in Ceylon—having a case in which they sued a shareholder for the balance of his shares; they had contented themselves with the forfeiture of the shares. It was a question for their consideration, however, and as one of the liquidators he should be glad to hear their views on the subject, but if it were left to the liquidators they should try to recover as much of the money outstanding as they could recover.

Mr. CREASY remarked that much inconvenience was caused by people putting down their names and not paying up.

The Hon. Mr. GRINLINTON:—I agree with you. It is not at all right, and I am sorry to see that so many persons who ought to have known better should do so.

Mr. KELLY did not think it would be advisable to go to extreme measures. They did not give up their powers until the meeting confirming the present meeting, so that it would still rest with them in any case where they thought it necessary or advisable to push matters to the extreme.

Acting upon the suggestion of the Hon. Mr. Grinlinton, Mr. Kelly intimated that it was intended to hold a general meeting to confirm what had been done at this meeting on Thursday, 28th May, at one o'clock, when he trusted there would be a larger number present than there was today.

This was all the business, and the meeting separated after according a vote of thanks to Mr. Kelly for presiding, on the motion of Mr. Thompson.

SALE OF FORESTLAND.

Mr. E. John sold on April 9th all that allotment of land No. 6, at one time forming part of Mooloyakelle estate in Upper Hewaheta, in extent 180½ acres, of which 27 are planted with tea, for R12,100 to Mr. J.G. Wardrop who bought on account of Mr. R. J. d'Esterre who owns the adjoining property.

CROWN FOREST AND CHENA LAND FOR SALE.

Some 17 lots from 17 to 186 acres each in Bambarabotuwa division of the Province of Sabaragamuwa are to be sold early in June. Full particulars will no doubt be advertised in good time; and as tea land is so much in demand, an advertisement with details should appear in our "Overland" papers for home capitalists to see.

LIBERIAN COFFEE CULTIVATION IN THE STRAITS.

The English mail of April 14th, brought us a letter from Mr. Thos. H. Hill, formerly well known as a Matale planter, and a careful experimentalist with new products at a time when coffee *Arabica* was still all the rage in Ceylon. Mr. Hill had long promised to give us the results of his experience as a planter in the Malayan peninsula, and the letter which will be found in our *Tropical Agriculturist* (on page 805) is, he says, the fulfilment of this promise. He sent his manuscript however, first to the *Singapore Free Press*, so being enabled to send us a proof copy. Perhaps the most interesting portion of Mr. Hill's compilation, in the estimation of practical planters, will be the figures showing the actual crops of coffee gathered for a series of years off separate fields at different ages of several Liberian estates. Curiously enough we were able to lay this return before our readers (see page 789) and to comment upon it some days ago, through its publication first in the Madras press. Possibly Mr. Hill had supplied a copy of his statistics to some Anglo-Indian visitor, and indeed the results are so good in average returns of from 7 to 11 cwt. of coffee per acre that Mr. Hill may well be ready to proclaim them from the house tops. With such figures before them intending coffee planters and investors will read with special interest Mr. Hill's remarks under the various headings of nurseries and selection of seed, of soil, climate, &c. There can be no doubt of the encouragement offered, nor of the fact that

the different Straits authorities (central and local) profiting by the past history of Ceylon, are most anxious to encourage and aid as far as possible, *bona fide* planters and capitalists in taking up land for Liberian or Arabian coffee and allied products. Mr. Hill does not say so much in respect of labour supply as we should like; but a curious statement is appended without comment, with the chief heading "Labour," entitled "Return showing the total expenditure on Public Works in the Colony and the Native States" during the ten years 1880 to 1889 inclusive. We do not publish this table, but it shows a very large expenditure indeed, the total (for Singapore, Penang and Malacca, under 'Colonial Government' and 'Municipalities' and for the native States of Perak, Selangor, Sungei Ujong, Negri Semblan and Pahang,) rising from 659,433 dollars in 1880 to no less than 3,483,743 dollars in 1889. Turning these into rupees, we get an expenditure of about 7½ millions of rupees on *Public Works* in one year which is very large indeed. We suppose a great part of it must be out of loans, rather than current revenue, and for railway extensions?

But now what object can Mr. T. H. Hill have in appending such a tabular statement to his planting letter and heading it "Labour?" Does he want to show that the States include a very large labour force accustomed to public works and who are likely to help the planters as the Governments slack off in their requirements, or is his object to show how well the country is being opened by roads, bridges, railways, &c. Anyhow, there can be no question that the Malayan peninsula under enlightened administration is being rapidly developed and that there is much encouragement to capitalists interested in coffee and other tropical products, to look to that quarter for investments.

THE POSITION OF TEA.

Discussing the outlook in tea from the wholesale and retail dealers' point of view, the *Grocer* says:—"The general statistical position of this article remains very strong, and the only element of weakness in it is the refusal of the trade to go on buying as freely as they did when prices were 1d to 1½d per lb lower than they are now. Many dealers and others, having well supplied themselves with available stocks, can afford to await the development of events, and while they keep out of the market as leaders of speculative operations the upward movement in quotations is likely to receive some check. The pauses that have occurred at one time and another since the big rise that was established about a month ago, have exercised a wholesome influence on the market, in preventing it from acquiring too confident an attitude, and in restraining both speculators and the more sanguine, not to say reckless, portion of the trade from carrying their ideas of value beyond reasonable limits. Although a material advance in the value of tea has ensued since October last, it must be remembered that it took place on prices which had been at an unprecedentedly low level, at least as far as China descriptions were concerned, and a seasonable rally in prices is not calculated to do much, if any, harm but rather the contrary; as to allow an important article of consumption to become too depreciated for either growers or capitalists to take a lively interest in it is to hinder production and prepare the way for still greater scarcity than may actually exist; whereas to urge in a legitimate manner the trade and consumers to pay a trifle more money as a gentle stimulus to turning out increased supplies is to insure future abundance and guard against the sudden alarms and surprises that grow out of real or imaginary deficiencies long before they are fully realised.

Viewed collectively and in their broadest light, and taking one kind with another, the clearances of tea in London since January 1st show a decided increase over those in the two previous years, while the stock, owing principally to the serious deficit in China makes, was about 18,000,000 lb. less than in 1889, and nearly 15,000,000 lb. below that in 1888, so that, with much more moderate estimates of the Indian crop for 1890-91 than originally formed, the immediate outlook for those whose purchases are dependent on easier prices being established soon is not of a very promising nature.—*H. & C. Mail.*

CEYLON PRODUCTS: PRICES AND PROSPECTS.

An experienced Ceylon planter who travels a good deal, writes:—

"Certainly *Tea* is coming to the front. Tea planters made a mistake in estimating results from young tea too highly, but I believe they have underestimated the yields of tea after it reaches 6 years.

"*Cocoa* under good shade looks now as if it would have a more extended area of growth than we were inclined to estimate up till now. Since my return I have seen very excellent results on what seemed two years ago barren cocoa by the successful planting of good shade.

"*Prices of coffee* I fear must go down 15s to £1 in value if we are to judge by the clearing-house returns for prospective deliveries. (See Rucker & Bencraft's Coffee Circular of the 19th March.)

"The favourable rates of *Exchange* enable us to meet lower prices which must prevail now that Ceylon *Tea* export in 1891 is to be so far ahead of 1890's. India will probably do better than last year, and China teamen will make an expiring effort this season, the last flicker of the lamp!"

RICHNESS OF LOUISIANA SUGARCANE.

(*From the Hills.*)

In the *Louisiana Planter and Sugar Manufacturer* of March 7th, published at New Orleans, there is no allusion to the lynching case, but our attention has been arrested by an article on the results obtained by the Caffery Central Sugar Factory in 1890-91. Every possible chemical detail is given, but the general results showing the richness of the canes in saccharine matter must suffice, thus:—

Cane ground, tons, 32,180; pounds, 64,360,000. Sucrose, per cent. of cane, 12.01. Sucrose, per ton of cane, pounds, 240.2. Total sucrose in cane ground, 7,729,636 pounds. Fiber, per cent. of cane, 11.02. Juice per cent. of cane, 88.98. Juice extracted, gallons, 5,433,881; pounds, 48,361,540. Juice extracted, per cent. of cane, 75.14. Per cent. sucrose in raw juice, 13.50. Total sugar extracted, 6,528,808.

Total commercial sugar made and estimated, 6,142,800 pounds; total commercial sugar per ton of cane, 190.88 pounds; sugar made from outside syrups, 650,000 pounds; total sugar made, 6,792,800 pounds.

RESULTS.

	Per cent. of cane.
First sugar of 100 polarization	6 80
Second sugar of 100 polarization	1.74
Sugar in third masse cuite	1.25
Sugar lost in bagasse	1.86
Mechanical loss and by inversion	0.34
Loss not accounted for	0.02
Sugar, per cent. of cane	12·01

It would thus seem that the sugar in the canes was equal to 12 per cent, against 10 to 11 in Queensland and only 8 in Ceylon; but the loss having been 2 per cent, the final result in sugar was 10 per cent of the weight of the canes, about as good a result as can be expected. We suppose. "Except in Peru," we ought to add, if dependence can be placed on the figures given in an article on "The Varying Saccharine Content in Tropical

Cane." From this article I quote as follows:—

Past experience and observation has taught that canes planted in virgin soil after the removal of the forest growth yield an abundant tonnage, with a low sucrose content as compared to those planted in land which has long been under cultivation. Climatic and other conditions cause a variation in saccharine strength in the juice of the cane from about 5 per cent. to as high as 22 per cent., which has been noted in Peru. According to M. Maumené (page 80, vol. 2), the percentage in the beet ranges from 3 to 18, and it is with the beet as with the cane, a heavy tonnage and a high saccharine content are incompatible. The quality of the soil is an important factor in the cultivation of the cane and beet, as it is admitted by high authority (M. Maumené) that "the chemical nature of the soil is entirely secondary; it is above all the physical texture and the corresponding absorptive powers which are of great advantage."

Excessive tonnage is produced by an undue amount of nitrogen or ammonia in the soil, and such must be carefully avoided whatever its source. The amount of ammonia in the annual rainfall varies much according to locality. Sir J. B. Lawes, of Rothamsted, England, found almost exactly one part in a million of rain, M. Boussingault in Alsace found ⅞ of that amount, and M. Barral nearly 3½ parts in a million of rain water of Paris, France. This source of supply is inadequate for full plant development as proved by analysis, and from whence the balance is derived by the cereals remains for science to divulge, yet the microbes which are supposed to supply the nitrogen in the growth of leguminous plants may in a lesser degree promote that of the grasses. In the production of grain it has been found that it takes over five pounds of ammonia to produce a bushel of wheat, and its equivalent of straw. Such valuable data to the farmer is had by direct field experiments, and it behoves those largely interested in the production of sugar to inform themselves as to what quantity of ammonia is required to produce a ton of cane, and the amount which can be used per acre, and not decrease the subtile element, saccharine, contained therein. The importance of field experiments cannot be too highly esteemed where it becomes almost imperative to produce maximum yields at minimum cost for field manipulations and manufacture.

So high a percentage of sugar as 18 in beets is probably due to free applications of nitrates. But beets seem in danger of destruction by a nematoid worm, as shown in an article from which the following is quoted:—

Mr. George Dureau, editor of the *Journal des Fabricants des Sucre*, has favored THE PLANTER with a copy of his recent pamphlet on the *nematode* or worm that has been found to be the chief cause of the seeming deterioration of the sugar beet in France and Germany. This worm penetrates into the beet roots, lives on their juice, accomplishes its metamorphoses there and multiplies with such frightful rapidity as to promise to render beet culture ruinous and finally impossible. For a long while the existence of these parasites was unknown, and it now promises to injure beet culture as the phylloxera has the culture of the vine. It was thought in Germany, that the reduced yield of beets was caused by the impoverishment of the soil from the too frequent planting of beets in it, and they designated this phenomenon as *fatigue betteraviere*, or *beet sick*, if we may utilize the analogy of *clover sick*, a phrase frequently applied in this country to clover lands similarly affected.

A careful study of these phenomena, made by a distinguished German Professor Julius Kuehn, has established the fact that there is no real exhaustion of the soil, and that the beet crops were reduced by the presence of numerous worms in the small, fibrous roots of the beet, and that, their destruction accomplished, the fields resumed their former fertility and gave as abundant yields as ever before.

The presence of the sereh in the sugar cane of Java, and of the nematode in the beets of Europe, show how insect or fungoid life is struggling against these two great crops, and here in Louisiana we are sometimes led to think that we may have exceptional advantages for the production of sugar from tropical cane from the fact that our cold winters destroy so many of those insect enemies that do immense harm in the tropics.

WHAT QUININE REQUIRES

is a Beecham or a Sequah, who will take it by the hand and lead it forth disguised as the latest elixir of life, who will blare forth its all-curing properties with brazen impudence and trumpets of brass, who will preach it forth as the only perfect panacea on mountain-side, on city-walls, in books, in papers, in all countries, and in all tongues. This has been done to a very large extent in the United States, with the consequence that half the world's supply is consumed there, although fever is not more prevalent than in Europe, nor nearly as much so as in Asia or Africa. Until the drug is well advertised, it will be driven out of the field by patent medicines, not one quarter as beneficial. It must be advertised, but in the meantime we again urge on Government to do all that lies in its power—and it can do great deal with the help of its hospitals, its vaccinators and the beadmen of the villagers—to make this drug popular throughout the Peninsula—*Madras Times*.

TEA-MAKING EXTRAORDINARY.

Mariawatte tea fields with their steady average of 1,000 to 1,100 lb. of made tea per annum for several years, have accustomed us to great things in Ceylon and we hear occasionally of fabulous quantities of green leaf being plucked per cooly. We have also the case of the Ruanwella estate that made 300 lb. of tea per acre in one month over a twelve acres field; and we have heard of a well-known Kelani Valley plantation which has given over 7,000 lb. made tea per week for as many as 10 weeks together at a time. But the news we have just heard of Bandarapola, Matale—in rather dry situation—seems to put all these in the shade, for Mr. Fraser has taken in leaf equal to 10,300 lb. a of made tea in one week or at the rate of 35 lb. per acre. Well done lower Matale! We are reminded that long ago it was prophesied by a practical, disinterested planter that the long valley (or as Highlanders would call it "Strath") or rather succession of valleys from Matale up to Ukuwella on to Watagama and why not on to Kandy, to Peradeniya, to Gampola and Nawalapitiya, would include about the richest tea growing land in the country.

As for total outturn and crops for the island, the prophecy made by the same planter some years ago of 100 million lb. for Ceylon's exports is not unlikely of realization. He would be a bold man in fact who would say that we cannot beat India in six to seven years' time, provided there is due encouragement to extend, continue and keep up cultivation.

BURMA RUBY MINES.—It has always been a matter for wonderment that the Burma Ruby Mine shares have been freely sold at a discount, when it is considered with what great *eclat* the Company was formed, the unique concession it possesses, and the powerful house under whose auspices it first saw light. The demand for the shares has been rather pronounced lately, on receipt of news from Burma decidedly encouraging to the Company, and we cannot but think that the shareholders who hang on will reap a good reward for their pains and patience.—*Colonies and India*.

THE PACKET TEA TRADE.

As Messrs. Horniman and Co. claim to be the founders of the packet tea trade, their experience as recorded by a representative of *Trade*, will doubtless be of some interest. This firm in the good old days used to make a point of advertising "the leaf uncoloured;" but their more recent transactions in India and Ceylon has altered all that.

"How long is it," asked the representative, "since your firm adopted the system of selling tea in packets?"

"Ever since the year 1826," said Mr. Horniman. "It was the founder of our firm who originated the system. His idea was that if tea were put up into air-tight tinfoil packages its fragrance would be preserved, and it would be possible to place before the consumer a tea which should be of uniform quality. How often does the average purchaser make the complaint that 'this tea is not so good as the last?' By the packet system it was sought to avoid any possibility of such disagreeable comparisons, and to make it easy for the purchaser to obtain an article which would vary neither in fragrance, strength, or price. In short, the aim was to present a tea which should be 'always good alike.'"

"That phrase seems to have passed into something like a proverb?"

"Yes," said Mr. Horniman; "and, what is more, we claim to have acted up to it. If you know anything about the tea trade you will be aware that it was in 1833 that it was thrown open. At that time importers commenced to introduce tea which was artificially coloured, the object, of course, being to pass off inferior leaves. There were two objections to this course, the first being that the colouring matter was more or less injurious to the tea drinker, and the second that a decoction made from inferior leaves was sure to be wanting in delicacy and fragrance. We refused to adopt this method, and insisted upon importing a pure uncoloured tea of good quality. Of course, our teas got a name and their reputation, despite the competition of these latter days, is more than maintained."

"Whence do you chiefly procure your supplies?"

"For many years, of course, we had to rely upon China tea alone, for it was not till 1850 that tea was produced in Assam. The very first importation from that province was consigned to us, and since that date we have always been able to secure the best spring growths from the finest of the Indian gardens. Ceylon, as you know, has recently produced some admirable teas, and we now import a considerable quantity of them. You see we devote ourselves exclusively to tea, and as we purchase upon a very large scale direct from Ceylon, India, and China, we are not only able to secure the best tea, but to avoid those extra charges which must be paid if you do your business through middlemen."

"That, no doubt, is the secret of a good many successful firms nowadays?"

"I suppose it is. It is certainly our own. We buy direct and we sell direct. We buy for cash and we sell for cash. The rule of the tea trade is to give three months' credit. We pay cash, and we take five per cent. That, upon a very large turnover, is a profit in itself. You will, perhaps, hardly imagine that we do our own printing. It may seem odd that tea merchants should be printers, but it must be obvious to you that by cutting our expenses down to the lowest point we are in a position to offer to the public tea of a quality which no one else could afford to let them have at the price.

"How did the recent reduction in the tea duty affect you?"

"We were enabled," said Mr. Horniman, "not only to give the public the benefit of the 2d per lb. which was taken off by Mr. Goschen, but to reduce our prices by still another 2d, without interfering with the quality of the tea article which we offered. This is only in accordance with the principle which the firm has pursued for the last sixty-five years in giving the public the best possible tea at the least possible price. It is upon that principle that our business has been built, and it would be obviously unwise for us to depart from it."

"Your packet teas have had many imitators?"

"Yes," was the reply, "and some of them have been anything but scrupulous. Our packets, our labels and our titles have been imitated, so much so in fact that it is well for the public to be on their guard. The old advice, that when you ask for an article you should see that you get it, certainly holds good in this case. Perhaps it is not surprising that this imitation has taken place for our labels have become almost universally known. Some twenty years ago and more a considerable enquiry for our teas arose throughout Europe and South Amercia, and to meet the demand our labels were translated into French, German, Italian, Spanish, Dutch, and Russian. Our success in foreign countries led unscrupulous competitors to copy not only our system of packing, but to imitate our trade marks and our titles. There is, however, a very easy method of finding out whether you have the real article or not, and that is by making an examination of the tea itself. Our teas consist exclusively of young and tender leaves, and they are therefore smaller than the large aftergrowth leaf which so largely constitutes inferior qualities."

"Your faith in the packet system, is, I suppose, as firm as ever."

"Yes," was the emphatic reply; "though I cannot shut my eyes to the fact that this system which we introduced has been grossly abused. There are those who find it necessary, in order to effect the sale of their tea, to offer the buyer a toasting-fork or a looking-glass after they have taken so many half-pound or pound packets. We have never found it necessary to resort to any such dodges in order to find a market. I rather think that by this time the public is beginning to open its eyes to the fact that the method I have referred to is a very dear way of purchasing tea. They now recognise that to expect good tea, when the seller has to give them a present of some considerable value in order to induce them to purchase it, is to expect a good deal too much."—*H. and C. Mail.*

COFFEE IN PERU.—The following paragraph among others shews the encouragement to the London Syndicate which is despatching Ceylon planters and other experts to report on land for coffee in Peru in the trans-Andean districts:—

No better coffee is produced in the world than in Peru, more especially that raised at Chanchamayo, in the department of Junin, and in the Province of Carabaya, in the department of Puno. The production amply suffices for the internal consumption, notwithstanding that the latter has much increased during the last few years.

"QUININE AND JAVA CINCHONA."—There is very little of consolation to Ceylon cinchona planters, or to London holders of quinine, in the article under the above heading on page 789. Java's supply of bark is by no means dwindling away—it is rather increasing and although she supplied the equivalent in bark for half the quinine consumption of the world in 1890, she is expected in 1891 to give enough for 4-7ths of the consumption—in other words she is to export about 7½ million lbs. of manufacturers' bark averaging 4·07 per cent sulphate of quinine! There will only be 3-7ths of the total consumption required in bark from Ceylon, India and South America. The only point open to criticism in this article that we can see, is the want of allowance for an increase in consumption. We cannot understand why with quinine at its cheapest—less than 2s per ounce—there should not spring up a demand for so valuable a tonic in new directions; while we feel sure that much larger quantities might be absorbed in Russia, Southern Europe and Africa, if only the cheap quinine were made freely available.

"CEYLON AND ITS GEMS."

(*Communicated*)

The writer of the article in the *Times of India* (see page 792) is rather out as regards the Gemming Ordinance, which is even worse than he makes it out. Previous to the present ordinance being passed, there were Government regulations for mining for Gold and Gems, and orders to gem on Government land could be obtained on the payment of ten rupees per annum, but no prospecting licenses could be issued. On the other hand Government would grant a prospecting licenses for gold on Crown lands on the payment of ten rupees, and the area over which the license might extend could not exceed half a square mile while it remained in force for six months.

The grantee had the exclusive right of prospecting within that area for that period and had the option at the expiration thereof of applying for a regular lease of not more than 50 acres within the said area on the terms that the minimum breadth of any lot was to be 70 yards, and the period a term not exceeding 20 years, at the expiration of which the lease was renewable at the lessee's option on such terms as the Governor and Executive Council might fix.

These good regulations have all been repealed, and in their place an ordinance has been passed for gemming on *private lands only*, and there is nothing said in this ordinance about working for *gems* or *gold* in Crown lands; so that if any person wishes to gem or prospect for gold he will have to make a special application to the Government Agent. A more ridiculous and pernicious ordinance has seldom been passed by the Ceylon Legislature. It is a pity that our Government servants should think themselves omniscient, for to this failing may be attributed the many ill-digested ordinances which are constantly being passed and found unworkable in their original form.

As regards your remarks in Tuesday night's issue, I think your estimate of the value of the gems found in Ceylon much nearer the mark than that of the "Roving Correspondent" of the *Times of India*. He also seems to think that the "European speculators" may find gem mining unremunerative; but if this is so, I think it will be due to the "poor native" appropriating the best stones and receiving regular wages besides. Under such favourable circumstances the paucity of "European speculators" is all the native has to complain of; but the "European speculator" may well grumble when he finds his attempts at developing an industry baulked by those who should be the first to help him. Gem digging as practised by the natives encourages them in idleness, gambling and all kinds of vice; but as practised by capitalists it means regular work and wages for the miners without the unnatural excitement which follows such pursuits; that is, of course, provided a plan to prevent stealing could be devised.

DISEASES OF PLANTS.*

After a few introductory observations on Phytopathology in its general aspect, the lecturer proceeded to discuss the questions relating to Parasitic Fungi in their connection with Plant diseases:—

The plant diseases caused by the presence of parasitic fungi are almost entirely local diseases; it is quite exceptional to find a plant constitutionally affected. True it is, that in many cases, especially with cultivated plants, the local disease is either so extensively distributed upon the host, or, more frequently, that the lesions are so numerous, that the host plant is killed by the parasite; but anything analogous to those human diseases, in which an entrance having once being effected by a microbe, the whole organism becomes permeated by disease, as in the case of febrile disorders, is practically almost unknown in plants.

Neither do we find that heredity plays nearly so important a part in the etiology of fungoid plant disease as it does in the animal kingdom. There are instances, and important ones, too, in which something akin to heredity comes into play. Certain varieties of Wheat are more liable to suffer from the attacks of mildew than others; certain varieties of Apple are more liable to canker than others; but these are more instances of the constitutional peculiarity of a variety than true heredity. A better illustration is, perhaps, afforded by the Potato, some sorts of which seem to be hereditarily disposed to take the disease more easily than others; while, on the other hand, certain sorts seem to have the power of resisting it better, inasmuch as their foliage longer withstands the attacks of the Phytophthora.

Just as we observe that certain epidemics affecting the human race, when first introduced into a community, assume great virulence, and spread with great rapidity; after a time, the type becomes less severe, and although the cases are not less numerous, yet the disease, we say, wears itself out. The outbreaks of cholera which have occurred during the present century, afford an apt illustration. The introduction of measles into Iceland, and into the Faroe, and the Fiji Archipelagoes took place in recent times. Like smallpox and syphilis, it was much more severe and fatal when thus imported into virgin soil (Fagge).

In like manner, we find that many epidemics of fungoid plant disease, which at their beginning are marked by extreme virulence, after a time change in type, and become less and less severe. The outbreak of the Potato disease in 1845 is an illustration, and although the disease is still present only too severely amongst our Potato crop, yet we have never had so severe a visitation as occurred in the above-mentioned year. More recently, the Hollyhock disease has afforded us a parallel case. The fungus, Puccinia malvacearum, which causes this disease, was unknown in Europe prior to 1869, in which year it was observed in Arragon, in Spain. In 1872 it was noticed in the Department of Marne, in France; in the following year (1873), it had extented over France into England, devastating not only the Hollyhocks, but attacking also the indigenous Malvaceæ. For several years, so virulent was it, that the Hollyhock practically disappeared from our gardens. The fungus is still present with us, and can be found upon almost any of the common Mallows; but it has lost, to a great extent, the extreme virulence which characterised its first outbreak. Our indegenous Mallows remain with us, and the Hollyhock is beginning to re-appear in our gardens. A very similar case is that of the Celery disease. Some years ago Puccinia Apii appeared on cultivated Celery, and threatened to become as serious an affection as the Hollyhock disease subsequently proved. It spread very widely in Great Britain, and greatly alarmed horticulturists; but it soon spent itself, and although the Puccinia is common enough on our wild Celery plants now, yet we rarely meet with it in our gardens.—*Gardeners' Chronicle*.

* A course of lectures delivered before the Royal College of Surgeons by Professor Plowright, M. D., in February, 1891.

IMPROVED TEA MACHINERY:

JACKSON'S PATENTS:—NEW DRYING AND WITHERING MACHINES.

INFRINGEMENTS OF PATENTS: MORE WORK FOR THE LAWYERS.

Mr. Jackson of Aberdeen, the now famous Tea Machinist and Engineer, was, as we announced, a passenger by the S. S. "Massilia" and the Colombo lawyers will, at least, welcome his advent. For, it would be scarcely necessary for Mr. Jackson to have left the superintendence of his Exiperimental Workshops at home, save for "legal" business which specially called for his personal presence in Colombo.

The infringements of his patents which Mr. Jackson considers he can prove before law courts this time —no notice having been taken of business remonstrances—concern two rollers, the one prepared and patented by Mr. John Brown of the Uva Companies, &c., and of which about a hundred are supposed to be at work in Ceylon Tea Districts, and the other, the Tea Roller known as "Law & Davidson's."

But having to come out to consult and direct the lawyers. Mr. Jackson has some interesting new machines which he intends while here to bring before the Ceylon planters. We refer, first to his new "Britannia" Tea Dryer which offers great improvements on the "Victoria" dryer, more especially in the tea being fed below and the machine doing all the rest of the work for itself. There is a down-draft connected with it. Three sizes of machines to dry 1, 2 and 3 maunds of tea per day are made, costing about £100, £200 and £300 sterling each. The first of these Driers—one of the largest size—is about to be erected on Labukella Estate, Ramboda Pass, while others are on the way out. The "Britannia" looks a thoroughly substantial, workmanlike machine strongly made as indeed are all Mr. Jackson's machines, and the patentee is confident of it giving satisfaction.

Perhaps a machine of more general interest is the new patent Witherer which Mr. Jackson is bringing out. This, he is also confident, will prove a practical success. It is not generally known that Mr. Jackson keeps up an Establishment in Aberdeen solely for the purpose of endeavouring to devise and apply improvements to Tea preparing Machinery. Besides Mr. Dalgarno, there is a staff of eight Assistants and Mr. Jackson (like Mr. Edison of inventive fame) has to be the presiding genius. An interesting fact mentioned to us by Mr. Jackson as showing the rapid advance of Ceylon in comparison with India, is that the colony required about as many rollers as India last year, while for 1891, the demand is likely to be a good deal larger for our little island, than for the big continent opposite.

THE JAMAICA EXHIBITION: THE THE POTTER AT WORK.

In obtaining the services of a first-class English Potter the Commissioners of the Exhibition were performing a great service to Jamaica, and contributing to the real objects of the undertaking. The island possesses clay in vast quantities, the capabilities of which have never been thoroughly tested, and it was a happy thought to import a skilled potter, both to test the clay and to show how best it could be practically utilised. The potter is now stationed in the Exhibition, and to witness him at his work alone is worth double the amount of entrance money to the ground.

[The above, from the *Jamaica Gleaner*, shows what might be done if we had a Ceylon Exhibition. We have abundance of fine porcelain and terracotta clays in our island, which could be probably utilized if a skilled English artizan were imported to show the way.—ED. *T. A.*]

"THE CINCHONA MARKET"—writes an up-country planter—"is deplorable. It is the longest lane without a turning that I have ever had to do with—and I 'm beginning to regard bark with well merited contempt. I don't know if that will bring it to any kind of sense of the rightness of things, and what is due to growers?"

CEYLON TEA SELLING AT £10 12S. 6D. PER LB.—Where is this sort of thing to end? If only a certain number of Ceylon estate proprietors instruct their managers to compete with "golden tips" for the sake of the advertisement, Reuter will yet have a good many messages to send us about select parcels of Ceylon tea getting unprecedented prices in Mincing Lane. Meantime all this helps to bring Ceylon tea into everybody's mouth!—and we should be the last to complain. On the contrary we have to congratulate Mr. T. C. Anderson of Garmore estate, Maskeliya, on topping the market and "taking the cake" even from Gallebodde. How long will Mr. Anderson be allowed to remain champion?

SEA-WEED AND COCONUTS.—The seashore between Colombo and Mt. Lavinia—and indeed much farther down the coast—is, at this season, strewn with large quantities of sea-weed washed ashore. This has been the case for many weeks back, and yet only in very few cases so far as we know, has any attempt been made to collect this useful manure and apply it to the neighbouring coconut palms. The apathy of the villagers in this respect is very striking. There can be no doubt that a very little exertion in digging round the roots of their trees, and applying rubbish, sea-weed, &c., (that would be much better in every way if buried), would increase their crops of nuts very materially; yet, with the fewest possible exceptions this is never thought of, and absolutely nothing in the shape of cultivation is attempted.

TEA UPCOUNTRY.—It is quite cheering to note the universal good report of tea from one end of the hill-districts to the other, and of its flourishing so famously even on old coffee estates. For instance, in Hantane, take the upland valley above Kandy, with Oodowelle—opened over 50 years ago,—Oorogalla, Horogalla and Ingrogalla, all giving good tea and promising well. Oorogalla with 280 acres of tea is quite a model of what a well-cultivated old coffee plantation may be expected to do in tea. But the same is true of many of the old Elkaduwa and Matale places, while rivals to Mariawatte are to be seen around Ukuwala; and on the road North of Matale, some of the finest tea in the island is to be seen. Whose is the small field of tea on the roadside near Nalanda, many miles out? It is neglected and all weedy, but the tea is resolved that no other jungle shall have lodgment and is forming a jungle of its own; for as an old Kandyan Arachchi said in the early days of tea "It is a jungle plant and not like coffee at all."

LINNEAN SOCIETY.—At the meeting held on February 5, Prof. Stewart, President, in the Chair. Messrs. Richard Bentley and E. S. Goodrich were admitted; and Messrs. T. F. Bourdillon, C. T. Keane, and A. M. Marshall were elected Fellows of the Society. Mr. Clement Reid exhibited and described some recent additions to the fossil arctic flora of Britain. Mr. Thomas Christy exhibited and made remarks on some specimens of honey: (1), "Arbutus honey" from Turkey, said to produce great drowsiness and sleep; (2), "Eucalyptus honey" from Mount Barker, Adelaide, said to possess valuable therapeutic properties; and (3), so-called "wool honey" from the Euphrates, collected by natives from the leaves of the Oak, and which would be more properly termed "honey-dew," being formed by aphides, and not by bees. On behalf of Mr. Gammie of Sikim, Mr. C. B. Clarke gave an abstract of an interesting paper on "The Tree Ferns of Sikim," in which several moot points were discussed, and difficulties cleared up. At an evening meeting to be held on February 19, 1891, at 8 p.m., the following papers of horticultural interest will be read:—"The Dillenian Herbarium," by G. C. Druce, F.L.S.; and "Some points in the life-history and Rate of Growth in Yew Trees," by Dr. John Lowe, F.L.S.—*Gardeners' Chronicle.*

Correspondence.

To the Editor.

PLANTING IN THE NATIVE ESTATES, OF THE STRAITS SETTLEMENTS.

To the Editor "Ceylon Observer."

Dear Sir,—In forwarding you the crop returns of our estates perhaps a few words on the subject may not prove unwelcome.

In 1878, when I was leaving Ceylon, I promised to send to a personal friend a treatise on the rotation of manures, a subject which had occupied much of my attention in connection with the estates of which I was manager in Ceylon.

I finally came to the conclusion in Ceylon that we had started too late, at any rate on most estates, and for estates to become more permanently productive it would be necessary to do more to cultivate the land, and that trees should be younger at the time of commencement to give the cultivator satisfactory returns. The hard life of a pioneer is not calculated to foster writing in any form and therefore my promise was never fulfilled, and as time has gone on and I have gradually been developing what might have been called theories into practice, I have felt less and less inclination to write until I could, as I can now, refer to actual results. I think that the measure of success so far attained will gradually be developed to an even greater extent.

Estate Nurseries.—I will commence with the nurseries of an Estate. These have always been made from seed from carefully selected trees in the youngest planted clearings in some instances, and in others from the older coffee. But recently marking the great improvement in the form of all the last planted clearings in having their primaries quite close to the ground, I have decided only to plant the cherry from the selected trees of the youngest clearings. The seed having been gathered, is pulped by hand, and any small parchment and malformed beans rejected. The seeds are then laid on raised platforms with earth, ashes, etc., to germinate, and as they germinate they are carefully put into the beds in the nurseries, where they are kept constantly top dressed with burnt earth, ashes and *lime*, if available. In one of the last nurseries out of 16,752 germinated seed 16,750 were put out into the field. I am inclining more to again bring selection into play, by planting my nurseries 8 in. apart and only putting out the selected plants, which it is my intention in future only to put out after they are shewing primaries. The clearings, having been planted with selected plants, from selected seed, from selected trees, are only treated in the ordinary way, except that should a plant show signs of weakness in any respects, it is either at once taken out and destroyed or another plant is put alongside it, and when the time comes the selection made as to which is to have its life granted. The youngest clearings are being topped at 5 ft. 6 in. having ample primaries they are planted 9 ft. by 10 ft. but I am inclined to think I shall probably feel my way back to 12 ft. by 12 ft. and putting out much larger plants than I have hitherto done. Stumps come on splendidly, but I have the greatest objection to that little piece of dead wood that you can generally find in a plant, however vigorous, if it is cut across just above the place of junction between the bud and the top of the stump. Even when they are old trees you can find this. From this until the 4th or 5th year the plants receive ordinary care and attention, except that they are pruned every 6 weeks, or at longest two months. From the fifth year at latest commences the cultivation of the land. You will remark I do not say manuring the tree, although at first it really amounts to that.

For the first year I have used oil cakes of various kinds, ashes and bones mixed with as much earth as possible. In my opinion the quantity of earth with which a fertilizer should be mixed cannot be too great although it is an advantage to put ashes (the potash being so heavy and sinking so rapidly) on the mixed earth. For the second year I use much the same mixture, with the addition of burnt earth, but differently applied.

For the third year, according to the nature of the soil, I either mulch with lalang (*Arundinacea Imperata*) Ellook it is called in Ceylon; or else lime the land with quick-lime, about 40 pikuls to the acre, a pikul being 133 lbs. It would depend upon the nature of the soil, and transport facilities which I should have done first.

This is as far as I have got at present, but the fifth course of the rotation would include digging over the land and turning the weeds in.

I should mention that weeds are allowed to grow sometimes for 3 months on end, after the 4th year, and they have been allowed to grow for as long as 6 months, and then cleaned up and kept clean by weeding, once in 3 weeks, for 6 months on end. I am entirely opposed to an estate being always clean after its fourth year, although I would keep the clearings clean, there being sufficient humus on the soil to absorb the rain and fix the phosphoric acid contained in the rain water.

I will now proceed to give you a few remarks on Climate, which we can only change for the worse wilfully; Land, which it is in our hands to improve; and Labour, which with the aid of the Government could be put upon a satisfactory basis.

Climate.—In 1879 I referred to the climate as being near perfection for the growth of Liberian Coffee, and I think that the results may be said to bear out that view, that is to say, the present climate; but if or when the climate is changed by the denudation of forest over large areas we shall probably see that our coffee will fail in the same way that it has in many other places. With this experience to look back on, I submit it would be well worth while the Government considering how this is to be prevented, more especially as they derive an income from export duty and rent on the land. At this stage of the development of the country it would be an easy matter to prevent that loss of moisture in the atmosphere and to prevent any radical changes in the climate. The amount of moisture contained in the atmosphere, the heavy dews and morning mists lying over the trees, often until 8 o'clock in the morning, are some of the most important factors in the successful growing of large crops of coffee per acre. Whilst they exist, with care and cultivation we may look for equally good if not better crops than those the statement I forward you shew. When these mists and dews have disappeared by reason of the forest being extensively felled, we may look for our crops to fall off, as they have elsewhere. This certainly will be remembered by some of the old planters of Ceylon.

How then is it to be prevented? By the Government reserving the right in the public interest to control the felling of the trees. Thus A wishes to plant an Estate of 300 acres, the Government sell him 1,000 or they sell him 300 as he wishes, and retain the 700. When his 300 acres have been planted and perhaps part of it worn out, he applies for part of the 700 acres which should be granted to him acre per acre for his land, that is for the time worked out. That is planted with an agreed number of forest in fruit trees per acre that are visible and subject to verification. But 23 years' observation of tropical cultivation leads me to believe that perennial cultivation, to be successful, is a system of long crops and long fallows, which the system I advocate admits on although I fear the desire of those in charge of new countries to increase the revenue at the cost of the capital of the country, which is as much in its climate, as its soil, and its minerals, may not procure for these views the consideration that the results of cultivation in similar tropical climates would lead one to expect and hope for.

I am well aware that for one or two years the dryer atmosphere will produce even more blossom and sometimes even crop, but the trees will not stand up to the crop or recuperate so quickly.

Labour.—This all-important item to the planter might easily and quickly be put upon a satisfactory basis for those who did not object to paying their coolies well. At present labour is not altogether satisfactory but the reason is not far to seek, as you will see from the attached table of amount spent on Public Works and Municipalities during the past 10 years. But when I tell you that neither the Municipalities or the Governments have any fixed staff of labour and that their attempts to import immigrants would not exceed 500 men during those ten years you will see how serious the position is. By the right of the longer purse they can always attract any labour from the estates, so that some planters against their will are compelled to work with indentured immigrants. With two exceptions that I know of, amounting to about 1,800 men, I am under the impression that the labour imported by Government contractors would not exceed 100 men in any one year. I may tell you that very little work is done departmentally, and what is done departmentally the labour is derived from the same sources in the same manner, the so-called open market—that being any coolies that can be obtained locally. Under these circumstances, which I trust the report of the Labour Commission may in some way alleviate, you can recognise that we are driven to employ indentured immigrants against our will, costing on the estate, with which I am connected about $27 each; of this I may recover possibly $9, but with runaways, incompetents, sickness and deaths it probably does not exceed an average of $6. Some of the officials say, 'What harm do we do? You get a man on agreement and when it is expired we take him at higher wages," but in my opinion the answer is "As long as you equally supply in proportion to your requirements the *local* market, we have no cause of complaint, but until you do so, you are strangling planting enterprise in its infancy by competing for the labour they have imported."

There are certainly few if any Ceylon Planters who will not say that a free coolie is cheaper at 25 cents per day than an immigrant at 14.

Paradoxical as it may sound, in my opinion an emigrant is cheaper on a one year's agreement and 20 cents per day, than on a 3 years' agreement and 14 cents, owing to the bulk of the men being of a better class. But the recruiting in India is miserably bad, and owing to the treatment received at the hands of the professional recruiters the men will not go to bring their families and friends as in Ceylon. If you get 35 good and fairly good, 15 of indifferent, bad and absolutely useless in a gang of 50, you may consider are you well off.

It would not matter to us whatever rates the Government paid if they imported a proportion of their own labour, as it would render the countries popular and induce a flow of immigration to them.

So much for the Tamil question, upon which I speak with some feeling, from having been compelled by want of labour to abandon 360 acres of Coffee in Sungei Ujong in 1884 although it had over 5 cwts. an acre on it. Pickers were not to be had and as the crop had all dropped the year before it was useless to spend further money on upkeep.

At the moment I am well supplied on all the estates and I hope to remain so from the growing popularity and a few old connections that have come from India, as free men, but there is the contingency to be faced that the Public Works in connection with the development of the States may at any time be let at such rates that all the labour from the estates may be drawn away.

We have then left Malays, Chinese and Javanese.

Malays are excellent labour for many kinds of work, and particularly nice people to work with. If I knew an estate had been planted by Malays I should feel inclined to put a slightly higher value on it. They are such very careful planters and they plant a tree as if they remembered that it was expected to give returns for 30 years or more. For felling, shed-building, timber-cutting, roofs and many other works, although their wages are rather high—from 26¼ to 35 cents—they are not only very valuable but their work does not become expensive

Chinese as sawyers, carpenters and artisans, when they mostly speak Malay, are largely used and good men at their trades. The coolies are good for heavy work, but the great objection to employing them is all arrangements must be made through the head man who can talk Malay and he almost invariably robs them and tells them it is the employer. They cannot therefore be looked upon as satisfactory to the coffee planter.

Javanese are in much the same category. Few of them speak Malay and they are mostly worked through a mandore. I have had a gang of 50 men working for me for 4 years on end, and on and off for another 3, and never had a dissatisfied word from them, but then the mandore was an excellent fellow, and he still continues to work for me at times although now a man of means.

Watchmen are mostly Sikhs or Bengalis and I have no doubt in time they will bring friends to work on the estates.

Soil.—Attached will be found the analysis of 4 different parcels of soil. They were all taken from 6 inches below the surface. No. 3 is of course an ideal soil but very wet. No. 1 is the poorest land of the Malay Peninsula, but I have seen fairly good young coffee on it, and it is used by the Chinese or Pepper and Gambier.

No. 2 is the soil taken from Batu estate and from the paper you will see what the crops have been and are, with its surface soil intact. Only over-bearing trees require manure for many years to come.

No 4 is from Linsum estate and there again you have practical results to judge from. They are noted on the 1·24 by the analyst as being poor in potash and phosphoric acid. The one has been supplied in ashes and burnt earth and the other in the bones.

There are all sorts of soil, and all kinds of land, steep, undulating, flat, rocky and free from stone, stony and extensive alluvial deposits of rich soil.

I cannot conclude this letter without expressing my hearty thanks to all the officials for all the assistance and kindness that they have shown to me both in the Straits Settlements and the Native States and to express the hope that with their continued assistance - may become that rare bird, a successful pioneer, owinI entirely to the good will and assistance received ig difficult times from the many officials who have taken so much interest in developing planting in the Straitsn

Yours faithfully,
THOS. H. HILL.

Soils.

Analysis of three samples of soil marked 1 2 and 4, dried at 212° Fah.

	No. 1.	No. 2.	No 4.
Silicious matter	81·166	72·000	68·567
Alumina	8·400	14·966	16 800
Oxide of Iron	4·656	3·779	6 150
Lime	206	336	261
Magnesia	166	300	433
Potash	006	135	193
Soda	153	151	141
Phosphoric Acid	044	121	083
Sulphuric Acid	051	054	069
* Organic matter Water of Combination &c.	5·093	8·158	7·303
	100·000	100·000	100·000
* Containing Nitrogen	·033	·126	·140

All of those soils are poor in potash, No. 1 being particularly so. They are also exceedingly poor in Phosphoric acid, especially No. 1. They would all be better for liming.

So-called soil, No. 3.

Water (*i. e.* moisture)	...	33·00
*Organic matter, &c.	...	24·56
Phosphoric Acid (Phospate of Lime 13·49)		6·18
Lime	...	5·72
Sulphuric Acid	...	6·17
Oxide of Iron	...	4·05
Alumina	...	2·69

Oxide of Copper	...	·12
Magnesia	...	·45
Potash	...	·78
Soda	...	·69
†Nitric Acid	...	3·50
Silica	...	12·90
		100 00

*Containing Nitrogen 95 ·18
† Do do 89

Total nitrogen 1·84 Ammonia 2 23

CROPS.

Statement of Produce of Liberian Coffee Estates in the Native States. [This was given in *Observer* of March 13.—ED. *T. A.*]

Memorandum of number of BOXES OF CHERRY gathered on the Estates, showing when the crop seasons are.

LINSUM ESTATE.

	1884.	1885.	1886.	1887.	1888.	1889.	1890.
January	—	—	452	397	501	692	1,328
February	156	97	653	477	910	390	399
March	—	305	—	153	493	721	789
April	—	69	143	27	136	299	192
May	128	193	8	—	224	—	—
June	159	—	115	385	439	854	756
July	98	—	577	528	505	1,188	663
August	137	216	225	381	408	316	187
September	—	577	—	—	—	38	32
October	—	415	—	138	—	—	30
November	—	140	83	6	143	60	58
December	—	485	329	293	557	367	392
Total	..678	2,502	2,495	2,785	4,336	4,925	4,756

S'LIAN ESTATE.

	1885.	1886.	1887.	1888.	1889.	1890.
January ..	—	680	230	534	412	483
February ..	—	182	425	446	739	887
March ...	13	46	44	303	175	86
April ...	23	—	—	158	103	43
May ...	174	25	10	252	215	—
June ..	—	328	175	576	323	510
July ...	—	394	244	264	434	513
August ...	—	202	92	267	318	46
September ...	—	—	64	149	27	27
October ..	259	—	41	—	—	—
November ..	10	54	95	55	110	51
December ...	146	364	236	338	316	529
Total ...	625	2,275	1,656	3,342	3,172	3,169

WELDS HILL ESTATE.

	1886.	1887.	1888.	1889.	1890.
January	248	482	553	643	435
February	210	498	704	527	507
March	76	—	72	—	260
April	21	163	234	—	—
May	26	61	—	—	—
June	603	284	624	1,214	290
July	58	—	487	870	435
August	131	260	—	—	—
September	—	—	—	—	—
October	—	31	6	—	21
November	205	112	507	2	56
December	512	820	195	1,165	369
Total	2,192	2,712	3,882	4,421	2,374

BATU CAVES ESTATE.

	1888	1889	1890
January ...	—	—	149
February ...	—	90	265
March ...	—	164	95
April ...	50	—	—
May ...	—	—	—
June ...	84	110	125
July ...	—	—	102
August ...	30	107	—
September ...	80	—	—
October ...	—	—	—
November ...	—	—	—
December ...	260	18	—
Total ...	591	489	—

CEYLON TEA IN RUSSIA.

St. Petersburg, 4/16th March.

DEAR SIR,—By today's post I have sent you two circulars of the "United Kjachta Tea Co.," which have opened a large business in St. Petersburg. The pictures on the back represent the primitive methods of transporting the tea from China, through Mongolia, Kjachta and Siberia before it reaches Russia. The central picture represents the shop belonging to the Co. on the Nevsky Prospect.* It was my intention, had I remained in the trade, to have started a similar establishment in Petersburg or Moscow and sell Ceylon tea in its pure state or mixed with Chinese in order to suit the taste of the public. This would have been the first step before launching out in a stil larger business.

The Director of this tea business informs me that he would like to receive samples of the finest Ceylon teas direct from Ceylon, as he finds the Ceylon tea very suitable for mixing with the Chinese which is wanting in flavour. In case any of your planters wish to start a business in Petersburg he would be quite willing to sell the Ceylon tea in its pure or mixed state. I think this would be a grand chance for the tea planters of Ceylon, and as they are not strong enough in this country to break down the opposition of the wealthy tea merchants, they could not do better than work together with them.—I remain, yours very truly,

WM. BARNES STEVENI.

P. S.—A tea merchant from Irkutsk has also asked for samples of Ceylon tea.

SALT IN AGRICULTURE.

March 28.

DEAR SIR,—I feel very gratified at the support my appeal has received from the Press. I shall in this communication offer a few remarks on the editorial comments on my letters, chiefly to keep the subject before the eyes of the public and the Government, so that the latter might be induced to take action in the matter.

It has been urged that no new arguments in favour of the manurial value of salt, or of the difficulty of rendering it unfit for food are to be found in my letters. I expressly disclaimed any pretensions to originality. What can I, a layman, say that is new of a substance whose manurial value has been acknowledged almost from the beginning of time, and of whose virtues the votaries of Agricultural Science have since sung? What we are immediately concerned about is, nor so much its value as a manure, as its indespensability in coconut cultivation and what is well known is reiterated, that Science has proved the possibility of purifying salt that has been mixed with offensive substances. The practical man is concerned with enquiring whether the average Native, Sinhalese and Tamil, is so conversant with the teachings of Science as to experiment with contaminated salt, and whether there is the slightest probability of his using such salt as food, even were he able to purify it. Those who profess to answer these questions in the affirmative will proclaim their ignorance of the habits and deep-rooted prejudices of

* These circulars can be seen at our office.—ED. *T. A.*

the natives. Mr. John Hughes, the consulting Chemist of the Ceylon Planters' Association, will, I am sure, be acknowledged to be a practical man, both by his training and by his wide experience of human nature. He writes in reference to the refusal of Sir James Longden's Government to issue salt to a planter in the Agras, who had applied for 50 tons at the export rate of R5 a ton, to fight against grub, and who offered to pay the salary of a Government officer to supervise the application: "I wish merely to point out that there are means available for so mixing salt with certain manurial materials, that the subsequent extraction of salt in a condition at all likely to be used for food should be rendered extremely improbable. First of all, I would say why not convert the crude salt into a manure by adding 2 or 3 cwt of finely ground fish manure or dried blood, or even Peruvian Guano to every ton of crude salt? Any one of these materials would so strongly impregnate the mixture, that the natives with their natural caste prejudice against handling any foul matter, much less of having the same brought in contact with their food would certainly refuse to purchase salt possessing any such peculiar odour as the above material would certainly produce. There is no doubt salt is a most useful and cheap source of manure, and it seems a distinct loss that any Government shoul throw difficulties in the way of its local use as a manure. My own view is that salt applied as an ingredient of a mixed manure is likely to be more effective in an agricultural sense then when applied in large quantity in the hope of destroying grubs." It will be noted that the above remarks apply chiefly to salt as manure for coffee. If I were convinced that the tax on salt were oppressive, and to any appreciable extent restricted its free use for human consumption, I should certainly when advocating its issue at cheap rates, have urged its abolition as an alternative. Though theoretically the tax may be objectionable it is not invidious and oppressive, as the tax on paddy unquestionably is, and I believe nine-tenths of the population do not regard what they get an equivalent for, as they do in the case of salt, as a tax at all, much less as an oppresive tax. Under the circumstances, I think the general denunciation of taxes and the setting up of the masses against the classes, with the issue of salt for agricultural purposes as a (pre)-text, was both uncalled for and mischievous. A futile attempt was recently made, not by, but on behalf of, the rich "to save themselves and faston burdens on the poor," when with the aid of specious arguments and sophistry laboured attempts were made to prove that those who issue rice to their labourers at a profit pay the impor-duty on it, while those who deny themselves this prcfit and give their labourers cash do not pay it. Therefore, the latter ought to pay an export duty on their produce, and not the former.

Though an official was at pains to state that it was not within his knowledge that salt was used in paddy cultivation, yet it is well known to those who take the trouble to observe what they see that those tracts of fields that are periodically submerged with sea water grow as fine paddy as one could well wish for. I have not, as suggested, lost sight of one of the chief attributes of salt, its hygrosuptive property. I drew attention to that, and spoke of it as giving salt a value "all its own." I look upon its ability to absorb tho moisture of the atmosphere as investing it with a very high value in those inland districts where the tree suffer much from the effects of drought. I applied salt to somo coconut plants I put out last season. Dry werther followed almost immediately after. The ever-widening circle of moist earth round the plants of a morning was very noticeable. The information that, though coconuts refuso to grow, or rather do not flourish, near Rangoon, 25 miles distant from the sea, and yet do remarkably well over 700 miles up the river Irrawady, and the reasons for it, aro highly interesting, and shew how unsafe it is to generalise from insufficient data. The natural conclusion a mind not given to dive deep for the why's and wherefore's of tho apparent contradictions it meets with, would arrive at from tho above facts would be that salt is not essential for the healthy growth of coconut palms. The truo conclusion is the opposite. The nuts at Bibile, like those at Mandalay, may be extraordinarily large because they belong to the large variety of coconuts. There are said to be eight varieties of coconuts and many sub-varieties. Large sized nuts are known as Siam coconuts. Trees of this variety can be seen at Morris Place, Slave Island. Many people have a fancy for these nuts, and it is possible that a few of these large-sized nuts were taken to Bibile and grown there, and tho trees now growing may have been propagated from these. This is a mere surmise based on my observation that soil has no marked influence on the size of nuts, which is almost entirely depended on variety. Large-sized nuts are no advantage, however, for we get fewer of these than normal sized ones from a tree. I passed through Bibile on my way to Batticaloa about a dozen years ago, and do not remember having noticed any coconut trees there. A very flattering opinion of my attainments suggests my being able to throw light on the reason for the size of the nuts at Bibile. As I said before, I lay no pretentions to being anything but a practical and observant Planter, with a rudimentary knowledge of Agricultural Science. If there be an Agricultural Instructor anywhere in the neighbourhood of Badulla, I would suggest that the Superintendent of the School of Agriculture direct him to make a careful report of the trees in question, with the nature of the soil on which they grow, and send to him a sample of soil within 18 inches of the surface, another from a depth of 2 to 3 ft., and a sample of the water as well. Exceptions go to prove the rule, and as fine trees on hard cabook soil as on sand may be met with on the sea coast, but I think I will hardly instance those at Beruwalla (Magalkanda ?) as an exemplification of this, though they certainly are better than trees met with inland on similar soil. The reason for this may be that the salt carried so freely to these soils renders soluble the large percentage of potash they contain as well as phosphoric acid and nitrogen in smaller quantities. Potash forms about 50 per cent of the mineral matter of the coconut tree. It is interesting to know that what observation led me to adopt is practised on the West coast of India. Being impressed with the value of water in coconut cultivation, I sought means to store as much rain water as I could on the estate I supervise. With this end in view I cut trenches as nearly level as possible at right angles to the slope of the land. These not only catch rain water, but improve the texture of the soil. This plan finds no favour with those whose book-learning teaches them that in good husbandry drains must be cut to draw away moisture. This has special reference to the cultivation of roots and cereals with delicate roots and on low-lying land. We should not blindly follow scientific theories, but must adapt scientific teaching to varying circumstances. What is absolutely necessary in water-logged soil and in the cultivation of plants with delicate roots, need not be adopted to the letter in the cultivation of coconuts, and on soils when the lay of the land and its composition favour free natural drainage.—Truly yours, B.

MR. HOLLOWAY'S CACAO FIGURES.

DEAR SIR,—It is very far from my object to say anything in the remotest degree detrimental to the cacao enterprise. On the contrary, it is my firm belief that exaggeration and high inflation such as I complain of in the exuberant outpourings from Wattegama are themselves the surest source of ultimate harm.

Mr. Holloway's letter of 30th ultimo does not fairly answer my objections. I objected to the suggestion that 6-year old trees would bear 100 cwt. per acre and yield a value of R6,500 value per annum per acre on his figures—of a yield of 300 pods. He now goes further and says "as regards full-grown treos giving from 300 to 400 pods any cacao planter can tell me of *many such* trees even of Caracas."

Where are we being led to?

One acre of 6-year old cacao is to yield us R6,500

per annum and when full-grown *many* trees will yield 33 per cent more!! He himself has to tax his memory and in support of his assertion recalls his visit to Galagedara in "the seventies." Let him go back to Galagedara in the "nineties" and tell us all about it.

It is not fair to single out rare instances and parade them as an index of ordinary results.

Let us be just sanguine enough to inspire our earnest work but never moved to inflation of our enterprize or *ourselves*. The production of gigantic pods, or leaves, or gooseberries (may I add, estimates and statements), and calculations based upon them, never had any useful effect in the promotion of agriculture.

The grain of wheat in all that chaff from Wattegama is contained in the remark that we have always something to learn.

I learnt long ago to avoid reading paragraphs about *enormous gooseberries*. I have still to learn.

PLANTER.

CACAO CULTIVATION: MR. HOLLOWAY IN REPLY.

Ukuwala, March 30th.

DEAR SIR,—With referrence to the letter signed "Planter" (given above) I can only say that if this planter and the others who consider my figuresmisleading will visit Franklands estate, almost adjoining Wattegama railway station, my son, who is in charge of that estate since October last, will be pleased to show them our Forastero cacao trees, the stems measuring from 20 to 27 inches in circumference, one foot above ground, from 18 to 25 ft. in height with a spread of from 15 to 22 ft. These trees are about six years old. As regards the outturn given in my letter, the pods were selected, weighed, put to ferment and washed under the supervision of my son who had made some arrangement with another planter to cure 100 of Forastero pods while he was to do the same with Caracas from his estate and then compare results. You will remember a pod weighing 2 lb. is not our largest, for the pod sent to you some time since weighed 3¼, and Matale 25 Exhibition pods between 2 and 3 lb. each. Anyone can beat the outturn even of one pod and then satisfy himself that I was rather under than over with my outturn of selected pods.

As regards full-grown trees giving from 300 to 400 pods per tree, any cacao planter can tell him that there are many such trees, even of the Caracas. I know on several estates such crop has been obtained on some trees. When I visited Greenwood estate, Galagedara, in the "seventies" I distinctly remember counting on several trees that number of pods; branches were supported by sticks. I then told Mr. van der Poorten if he allowed such crop on his young trees he must give them nourishment at once, else the trees would soon stop giving crop.

I am now planting up about 300 acres on this estate with Forastero cacao for Messrs. Owen, Bayford & Deverell. There is a great difference in quality and depth of soil, lay and aspect of land, in old shade as well as jungle shade. Yet by careful management, though costing a little more than common work, I trust to bring up the plants to be healthy and hardy all throughout and in time to give first-rate crops. An unchecked growth in plants makes the best bearing trees, though at times a stunted tree throws up a good sucker which also bears well.—Yours faithfully,

J. HOLLOWAY.

If those two planters who came the short cut through Goenambil and Franklands on 17th March 1889 and got in the train at Wattegama when I was also a passenger (a stranger to them and they to me) will now come down that short cut again they will see that Holloway, though he was successful on Maria and Raxawa, failed at Wattegama as they were pleased to say one to the other. They will see "Holloway" let the weeds and turf then grow with an object now obtained, they will find estate clean and trees full of vigour.

Though I am now a planter of 33 years' standing, yet I am not proud to say I am still learning daily. You sometimes hear youngsters who have been out about a year or so one say to another: "Oh, I know all about planting now." We shall never finish learning about the treatment of plants soil and. J.—H.—[Hear, hear.—Ed. *T.A.*]

MR. HOLLOWAY AND CACAO CULTIVATION

Greenwood, April 13th.

DEAR SIR,—It is only today that Mr. Holloway's letter is brought to my notice, owing to absence from home.

I am at a loss to understand why he mentions my name in it except if he identifies me with his antagonist "Planter" who I am not.

I find that Mr. Holloway honored me with his visit on the 29th September 1882 (not in the seventies). I do not remember that he gave me his valuable advice about giving nourishment to trees which had borne a heavy crop. I may assure him, however, that acting on the secret he thinks he imparted to me or on commonsense, I have tried the process in all its ways, but have found that it would not prevail against the root disease which began here in 1884, and attacks nurseries and young trees before the mature ones. Cinchona, jak trees, coconuts, &c., have also suffered in a great many places since then, but little notice has been taken of this as the change is gradual and I am also inclined to think that it is the cause of the other diseases which affect the coffee. But being no authority on this matter it might be well to put this down to *malnutrition*.

I am quite of the opinion of the "youngsters" that if they have an average intelligence they ought to know all about planting two or three products in the tropics in one year. Those great secrets people fancy having torn from nature are often old and well-known or prove valueless. Nature yet remains inscrutable in the main point which I saw admitted by a scientific authority on Agriculture a few months ago.—I am yours truly,

A. v. d. POORTEN.

A TRIP THROUGH THE KELANI VALLEY.

DEAR SIR,—It is now 12 months since I was up in the Kelani Valley, in my opinion the leading and most flourishing tea district in Ceylon, and it was with pleasure and expectancy that I left Colombo by the 2·30 p.m. coach on Sunday last, the 5th inst., for Awisawella. On starting the coach was only occupied by Europeans and the drive up was a pleasant one, the road being in excellent condition the whole way, and the horses, for a wonder, good. At Hanwella we picked up the popular Police Magistrate of Awisawella, Mr. Philip de Saram, whom I was glad to see looking hale and hearty, and the rest of the journey was passed in reminiscences of home experiences and adventures. I stayed the night at the Awisawella resthouse, and next morning proceeded by hackery to Ruwanwella. The change along this road is vast, as large new clearings are being opened up on the one side, while the other face is one conti-

nuous sheet of splendid tea, Dewalakande estate with its fine factory standing prominently to the front. At Ruwanwella resthouse, where I spent the night, I met Mr. A. E. Scovell of Strathellie, and together we travelled through the Ruwanwella group of estates, which in time should prove the most valuable in the district, as the soil is exceptionally good here, and the clearings are mostly planted up with indigenous and first-class hybrid jats. The new road to Veyangoda, which when finished will be as fine a cart-road as any up-country district can boast of, is making good headway now, passes through most of the best estates at this end, and the fields of tea are a sight worth seeing. Travelling along this road one remembers Mr. Inglis's song of "Tons and Tons, and Tons of Tea," and certainly the words are true. After leaving the Ruwanwella end we drove along to Lavant estate, Yatiyantota, there to be gladly welcomed and hospitably received by its ever popular proprietor Mr. F. J. Wright, whom I was glad to see looking the picture of health and spirits, his appearance speaking volumes for the climate of this end of the Kelani Valley. After spending the evening with him and going round his valuable property the next morning our party broke up, Mr. Scovell proceeding up the Gap to Strathellie, while I retraced my steps to Veyangoda, reaching the station to catch the evening down train to Colombo, which, owing to the Sinhalese holiday, was crowded to overflowing and consequently half an hour late. My trip was a most enjoyable one, meeting old friends and finding everything prosperous and flourishing, and I hope that the Kelani Valley and its "good men and true" will continue to keep to the front, "until the day after to-morrow." M. B.

ADULTERATION OF BONE DUST.

Kandy, April 15th.

SIR,—I beg to enclose copy of a letter from Mr. John Hughes consulting chemist to the Association inviting attention to a new form of adulterating bone dust that has come under his notice, together with the sample referred to.—I am, sir, yours faithfully, A. PHILIP, Secretary.

NEW ADULTERATION OF BONE DUST.

London, E. C., Feb. 27th.

A. Philip, Esq., Planters' Association, Kandy.

Dear Sir.—As consulting chemist to your Association I should like to direct the attention of your members to a new form of adulterating bone dust which has recently come before my notice. As readers of the *Tropical Agriculturist* are aware Indian bones are now being imported into this country in enormous quantities for the purpose of being used as manure. One firm alone having delivered 40,000 tons during the past year. Samples of these shipments come before me regularly for analysis; and while most of them are of good quality as regards phosphates and nitrogen there are several instances of admixture of sand to the extent of 10 to 15 per cent.

This adulteration however can usually be detected by the dirty appearance of the sample, so that its limits of practice are clearly defined, but the enclosed specimen is of quite a different character, and although having the clean appearance of genuine bone dust it nevertheless contains 10 per cent of adulteration in the form of crystaline carbonate of lime, the presence of which can only be detected by chemical examination, or microscopical inspection. Good bone dust should give no appreciable effervescence with dilute muriatic (hydrochloric) acid, and should present a uniform appearance under the microscope.

On the other hand if you add acid to the enclosed specimen you will notice a marked amount of effervescence as the result of the decomposition of the carbonate of lime; while under the microscope the crystaline appearance of the calcium salt stands out in marked contrast to the organic structure of the particles of bone.

This specimen contained only 47½ per cent of phosphate of lime and 4·06 per cent of ammonia as against 53 per cent phosphates and 4·60 ammonia present in 1st class Indian bone meal.

I trust this information respecting this new form of adulteration as well as the *easy means* of detecting it may be made public for the protection of planters in your island and India against this new fraud of the natives. Shippers of bone dust to this country will do well to take note of it also, and thus spare much disappointment to their representatives on this side who have to make a substantial allowance on all such adulterated deliveries.—Yours faithfully,

JOHN HUGHES.

TEA TRADE WITH FRANCE.

Kandy, April 15th.

SIR,—I beg to enclose copy of a letter from the Secretary to the Ceylon Association in London, transmitting copy of Report, &c., to the Trade and Treaties Committee of the Board of Trade by the Indian Tea Districts Association and the Ceylon Association in London with reference to the Tea Trade with France.—I am, Sir, Yours faithfully, A. PHILIP, Secretary.

4, Mincing Lane, London, March 13th.

The Secretary, Planters' Association, Kandy.

Dear Sir,—I enclose copy of a report made last December, at the request of the Trade and Treaties Committee of the Board of Trade, jointly by the Indian Tea Districts and our own Association.

On Saturday last at the request of the same Committee a deputation from the two Associations went to the Board of Trade and had half an hour's conversation on the subject of the report.

The Indian Association was represented by their President, General Hopkinson, Mr. Tye (Secretary) and Messrs. Benj. White, Stanton and Seton. On behalf of our Association the members present were Mr. Whittall, Messrs. Dickson, Rutherford, Shand and myself.

The Committee were fully represented and asked many questions as to trade in France both in tea and coffee.

Mr. Mundella, who presided, expressed his admiration of the progress made by India and Ceylon in the production of tea and while pointing out that France was not at present proposing to make any change in the tea duty said that if anything could be done that seemed likely to help on the sale of tea in France it should not be overlooked. He did not, however, see at present how any action could be effectively taken.

I enclose a copy of the first report of the Committee which has lately been issued.—I am, yours faithfully,—WM. MARTIN LEAKE, Secretary.

Joint Report to the Trade and Treaties Committee of the Board of Trade by the Indian Tea District Association and the Ceylon Association in London.

1. The importance of the Tea industry to Great Britain has increased considerably during recent years. Tea culture is now carried on so extensively in India and Ceylon that the welfare of this industry is a matter of national importance. Last season's Tea crop from these two places consisted of over 140,000,000 lb. valued in bond in Mincing Lane at £6,125,000. The present season's crop is expected to exceed this quantity by fully 10,000,000 lb.

2. Owing to the rapidity with which Tea production has been extended in India and Ceylon during recent years, it has become of paramount importance to the welfare of the industry that new outlets should be discovered and existing foreign markets encouraged.

3. The consumption of Tea in France is extremely small and has varied very little during some years past, viz. 1884, kilos: 530,664; 1885, kilos: 479,679; 1886, kilos: 552,676; 1887, kilos: 557,162; 1888, kilos: 516,834; 1889, kilos: 540,619.

4. The present high duty of 208 francs par 100 kilos we believe to be prejudicial to the increase of Tea consumption in France.

The total amount realized by the duty (including the surtax) only reached francs 1,249,642 in 1889.

5. Very little loss could thus result to the French Exchequer by reduction in the rate of duty, but in all probability a considerable increase would be gained through additional Tea consumption.

6. The surtax of fcs. 60 per 100 kilos on all Teas imported from places other than the countries of production is onerous because the limited trade in tea in France renders it expedient that small suitable selections should be provided from England rather than consignments sent direct from India or Ceylon. In 1889 out of a total consumption of kilos 540,619, 200,963 were imported from England.

7. As no tea is grown in French possessions, France can have no reason for protecting the article by a high tariff.

8. In England when the tea duty was 1s per lb. the consumption reached only 88,599,235 lb., and the duty yielded £4,429,961. In the last year of the 6d duty, consumption had increased to 185,578,298 lb. and the revenue to £4,639,457. In the seven months that have elapsed since the duty was reduced to 4d. the Home consumption has increased several million pounds.

9. In endeavouring to foster a trade in British-grown Tea in France both the Indian Tea Districts Association and the Ceylon Planters' Association sunk considerable sums of money at the time of the Paris Exhibition in 1889. These efforts have given sufficient encouragement to induce the Indian Tea Districts Association to incur heavy additional pecuniary liability during the current year.

10. In placing this report before you we do not wish to make suggestions as to the nature of any reduction in the tariff but merely to point out to you

(1st) the importance to the British nation of the welfare of the Tea industry; and

(2nd) the benefits which we believe would result to the revenue of France by a less onerous **duty.**

THE MILLING OF PADDY.—Mr. Charles Gairdner, Assistant in the firm of Messrs. Bulloch Bros. and Co., residing at Bassein, and Mr. Robert Ramsay, Engineer to the same firm, have filed specifications of an invention for the more economical milling and cleaning of paddy and other grains.—*Rangoon Gazette.*

CEYLON TEA IN CALIFORNIA.—From a recent Consular report on San Francisco, we quote as follows:—The Ceylon teas introduced here by W. H. Murray & Co. are finding favour. Joseph Tetley & Co. of London, established an agency here recently, and sell a good black tea at 2s 10d per lb. Heretofore black teas, worth in London about 1s 6d per lb. have sold here for 4s to 5s. As there is no duty on tea this is only to be accounted for by the fact that most of the people here drink green tea or coffee.

FAILURE OF A HAMBURG CINCHONA IMPORTER.—The failure has recently been made known of the firm of E. Richter, in Hamburg. The unsecured liabilities of the firm are said to amount to about 200,000*l.* The financial difficulties of the house are reported to have originated through its connections with the firm of Otto Richter (the late head of which was brother to the chief of the Hamburg house), of Peru and Bolivia, South America Mr. Otto Richter was the principal cinchona planter in Bolivia and the chief grower of the "cultivated Bolivian Calisaya" bark which has been a feature of our cinchona auctions for many years. These plantations were commenced at the time when quinine had not yet reached its zenith and it was an open secret that during the last two or three years the prices realised by the bark had not paid for its growing, harvesting and shipping. The firm also carried on an extensive trade in other South American products.—*Chemist and Druggist.*

THE SMALL CONSIGNMENT OF PERAK TEA, which we recently announced had been received here, has not been placed publicly on the market. Some experts and others have sampled the lot, and pronounce it of good quality. It is of good colour, though slightly strong, and brews out well; it will bear comparison with equal growth of India and Ceylon.—*L. and C. Express.*

MOSQUITOES AND YELLOW FEVER.—I am not at all partial to mosquitoes and regret that no 'reciprocity' exists in that direction between us, especially at the present moment when some twenty of these miniature vampires, are making an off-and-on dinner upon my person. Why they were created is one of those problems which may be explicable enough to the scientist, but is quite unfathomable to commonplace beings such as I. Nevertheless some use has been found for them at last, and that so near us as Cuba. Two physicians of Havana are busy at present inoculating, successfully, new arrivals against yellow fever through mosquitoes that have contaminated themselves by stinging yellow fever patients. Fifty-two cases of mosquito inoculation have been followed up and of those 8 per cent subsequently contracted the disease with a mortality of less than two per cent.—*Jamaica Gleaner*, March 9th.

CEYLON EXPORTS AND DISTRIBUTION, 1891

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total	Cinchona. 1891 B'nch & Trunk lb.	Tea. 1891 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1891 cwt.	Coconut Oil. 1890 cwt.	Pl'bag 1891 cwt.
To United Kingdom ...	20583	...	20583	1447370	18451772	8937	44210	318495	31003	21809	...	43057
,, Marseilles	...	33	33	...	9091	39	...	35100	...	...	...	...
,, Barcelona	...	...	...	..	3300	...	...	36000	...	...	...	...
,, Genoa	...	...	...	..	100	...	...	38700	14000	203	394	...
,, Venice	..	...	...	...	...	...	...	...	5600	...	...	...
,, Trieste	3672	16	3688	...	210	...	...	2100	3370	951	600	...
,, Odessa	...	...	...	...	...	...	...	...	...	1001	..	...
,, Hamburg	1	...	1	...	5065	77	1141	82975	42000	3816	501	8801
,, Antwerp	18	...	18	26662	50	...	...	7500	...	804	...	3094
,, Bremen	1	...	1	...	1789	..	...	...	...	...	...	...
,, Havre	...	...	...	3362	...	...	...	...	...	...	...	...
,, Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	10	...
,, Africa	35	...	35	...	19393	...	..	...	...	...	...	...
,, Mauritius and Eastward	14	...	14	...	23088	84	...	20168	...	1025	14049	...
,, India	918	1471	2389	...	36929	...	55517	14528	...	29658	11511	10
,, Australia & New Zealand	2046	347	2393	...	660456	...	40	1000	4200	603	1029	...
,, America	154	...	154	141545	31813	1049	...	12000	...	32347	4001	68726
,, Stockholm	...	...	...	...	300	...	...	...	...	...	...	...
,, Constantinople ...	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 20th April 1891	27442	1867	29309	1640377	19243156	10186	100908	568566	100173	92217		123688
Do 1890	43963	1063	45026	2288184	1651352	7446	133320	517714	90504	32095		99794
Do 1889	26672	2605	29277	2993960	8515545	7136	108523	940967	150511	99626		129755
Do 1888	66414	1795	68208	3299212	4774281	6627	111984	360149	349735	122810		71217

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, April 9th, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
ALOES, Socotrine	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic	Common and good ...	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red...	Renewed	2d a 1s
	Medium to good Quill...	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a 1½d
BEES' WAX, E.I., White	Good to fine	£6 a £7
Yellow ...	,, ,, ...	95s a 115s
Mauritius & Madagascar...	Fair to good	115s a 130s
CARDAMOMS—		
Allepee	Fair to fine clipped ...	1s a 2s 2d
Mangalore	Bold, bright, fair to fine..	1s 6d a 3s
Malabar	Good to fine plump, clipped	2s a 2s 6d
Ceylon. Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s 3d a 1s 6d
	Small to bold brown ...	1s a 1s 6d
Alleppee and Mysore sort	Fair to fine bold ...	2s 6d a 3s 11d
	,, ,, medium ...	1s 6d a 1s 10d
	,, ,, small ...	1s a 1s 4d
Long wild Ceylon...	Common to good ...	3d a 2s 2d
CASTOR OIL, 1sts	White	4½d a 4⅞d
2nds	Fair and good pale ...	3d a 3½d
3rds	Brown and brownish ...	2¾d a 3d
CHILLIES, Zanzibar ...	Fair to fine bright ...	70s a 75s
	Ord'y. and middling ..	60s a 65s
CINNAMON, 1sts	Ord'y. to fine pale quill...	7½d a 1s 2d
2nds	,, ,, ,, ,, ...	7d a 1s
3rds	,, ,, ,, ,, ...	6½d a 10d
4ths	Woody and hard	5¾d a 7d
Chips	Fair to fine plant ...	2d a 6½d
CLOVES, Zanzibar and Pemba.	Fair to fine bright ..	3⅞d a 4d
	Common dull and mixed	3½d a 3¾d
,, STEMS	Common to good ...	⅞d a 1d
COCULUS INDICUS ...	Fair sifted	12s a 13s
COLOMBO ROOT... ...	Good to fine bright sound	22s 6d a 28s 6d
	Ordinary & middling ..	16s a 20s
CROTON SEEDS, sifted...	Fair to fine fresh ...	10s a 15s
CUTCH	Fair to fine dry ..	24s a 32s 6d
DRAGONS BLOOD, Zanzibar ...	Ordinary to good drop ...	50s a 90s
GALLS, Bussorah & Turkey ...	Fair to fine dark blue ...	52s 6d a 57s 6d
	Good white and green ...	40s a 50s
GINGER, Cochin, Cut ...	Good to fine bold ...	70s a 75s
,, ...	Small and medium ...	41s a 52s
Rough...	Fair to fine bold ...	32s 6d a 37s 6d
,, ...	Small and medium ...	25s a 30s
Bengal, Rough	Fair to good	9s
GUM AMMONIACUM ...	Blocky to fine clean ...	20s a 50s
ANIMI, washed ...	Picked fine pale in sorts	£11 a £13
	Part yellow & mixed do.	£10 a £11
	Bean & Pea size ditto ...	£5 a £7 10s
	Amber and red bold ..	£10 a £12
scraped...	Medium & bold sorts ..	£5 10s a £11
ARABIC E.I. & Aden ..	Good to fine pale frosted sifted	50s a 80s
	Sorts, dull red to fair ..	35s a 55s
Ghatti ...	Good to fine pale selected	45s a 55s
	Sorts middling to good...	23s a 33s
Amrad cha.	Good and fine pale ...	60s a 107s 6d
	Reddish to pale brown ...	25s a 50s
Madras ...	Dark to fine pale ...	15s a 50s
ASSAFŒTIDA	Fair to fine pinky block and drop	35s a 80s
	Ordinary stony to midling	20s a 28s
KINO	Fair to fine bright ...	40s a 43s
MYRRH, picked	Fair to fine pale ...	£6 a £8
Aden sorts	Middling to good ...	70s a 80s
OLIBANUM, drop...	Fair to fine white ...	35s a 56s
,,	Reddish to middling ...	22s 6d a 32s 6d
pickings...	Middling to good pale ...	12s a 18s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER	Red hard clean ball ...	2s [illegible]d a 2s 6d
East African Ports, Zanzibar and Mozambique Coast	White softish ditto ...	1s 8d a 2s 3d
	Unripe root	1s 3d a 1s 11d
	Liver	1s 6d a 2s 2d
	Sausage, fair to fine ...	2s a 2s 2d
Assam,	Good to fine ...	2s a 2s 8d
	Common foul & middling	1s a 1s 10d
Rangoon	Fair to good clean ...	2s a 2s 3d
Madagascar, Tamatave, Majunga and Nossibe	Good to fine pinky & white	2s 5d a 2s 10d
	Fair to good black ...	2s a 2s 3d
ISINGLASS or FISH MAWS Tongue..	good to fine pale ...	3s a 3s 10d
	dark to fair ...	1s a 2s 6d
Bladder Pipe...	Clean thin to fine bold...	1s 6d a 3s 7d
Purse ...	Dark mixed to fine pale	6½d a 1s 8d
Kurrachee Leaf ...	Common to good pale ...	1s 9d a 3s 10d

EAST INDIA Continued. East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS
INDIGO, Bengal ...	Middling to fine violet ..	4s 6d a 6s
	Ordinary to middling ...	3s 6d a 4s 3d
Kurpah	Fair to good reddish violet	3s a 3s 7d
	Ordinary and middling...	2s 3d a 2s 10d
Madras (Dry Leaf)	Middling to good ...	2s 8d a 3s 2d
	Low to ordinary ...	1s 8d a 2s 6d
IVORY—Elephants' Teeth		
60 lb & upwards ...	Soft slightly def. to sound	£69 a £76 10
over 30 & under 60 lb.	,, ,,	£64 a £72
40 a 100 lb. ...	Hard ,, ,,	£49 10s a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,, ...	Hard ,, ,,	£25 a £35 10s
Billiard Ball Pieces 2¼ a 3¼ in	Sound	£78 10s a £85 10s
Bagatelle Points ...	Sli. def. to fine sound ...	£66 a £75
Cut Points for Balls	Shaky to fine solid sd.	£55 a £73
Mixed Points & Tips...	Defective, part hard ...	£31 a £53 10s
Cut Hollows ...	Thin to thick sli, def to sound	£30 10s a £57
Sea Horse Teeth— ⅜ a 4½ lb.	Crvd. crkd & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Bhimlies I, good & fine pale	12s 6d a 14s
	,, II, fair pickings	9s a 10s 6d
	Jubblepore I, good & fine	12s a 13s 6d
	,, II, fair rejections ...	9s 6d a 10s 6d
	Vingorlas, good and fine	9s 6d a 11s 6d
Madras, Upper Godavery	Good to fine picked ...	11s a 12s
,, ,, ...	Common to middling ...	9s 6d a 10s 6d
Coast	Fair	10s a 11s
Pickings ...	Burnt and defective ...	8s a 9s 9d
MACE, Bombay ...	Dark to good bold pale...	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,, ...	64's a 80's	2s 8d a 3s 1d
	83's a 180's	1s 6d a 2s 7d
NUX VOMICA Cochin, Madras and Bombay	Fair to fine bold fresh	11s a 14s
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour..	⅝d a ¾d
LEMONGRASS ...	,, ,, ,, ...	1½d a 1¾d
ORCHELLA WEED Ceylon ...	Mid. to fine, not woody	20s a 25s
Zanzibar ...	Picked clean flat leaf ...	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER—		
Malabar, Black sifted ...	Fair to bold heavy...	4¾d a 5d
Alleppee & Tellicherry	,, good ,, ...	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO, Lump ...	Fair to fine bright bold	15s a 21s
	Middling to good small...	11s a 14s
Chips ...	Sli'tly foul to fine bright	9s a 12s
Dust ...	Ordinary to fine bright...	4s 6d a 7s 6d
RED WOOD	Fair and fine bold ...	£3 a £3 10s
SAFFLOWER, Bengal	Good to fine pinky ...	50s a 60s
	Ordinary to fair ...	25s a 45s
	Inferior and pickings ...	15s a 25s
SALTPETRE, Bengal ...	Ordinary to good ...	16s 6d a 17s
SANDAL WOOD, Logs	Fair to fine flavour ...	£35 a £60
,, ,, Chips..	Inferior to fine ...	£9 a £30
SAPAN WOOD	Lean to good bold ...	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 70s
SENNA, Tinnevelly ..	Good to fine bold green...	6d a 8d
	Medium to bold green...	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a 1½d
Bombay ...	Ordinary to good ...	1d a 2d
SHELLS, M.-o'-P. ..	EGYPTIAN—med. to large	88s a 100s
	small and medium.	90s a 100s
	oyster and chicken	55s a 100s
large	BOMBAY—fine thick ..	50s a 85s
medium stout ..	bright fairly clean	95s a 102s 6d
chicken part stout	,, ,, ,,	85s a 95s
oyster part thin ..	,, ,, ,,	70s a 82s 6d
Muscat ...	Medium to fine bold	45s a 60s
Lingah	Sorts...	3s a 10s
TAMARINDS ...	Mid. to fine blk not stony	12s a 6d 15d
	Stony and inferior ...	4s a 6s
TORTOISESHELL ...	Fair & fine clean heavy	16s a 25s
Zanzibar and Bombay	Low thin to mid. clean	5s a 15
TURMERIC, Bengal ...	Leanish to fine plump finger	14s a 15s 6d
Madras ...	Fin. fair to fine bold brgt	16s 6d a 18s 6d
,, ...	Mixed middling... ...	15s a 16s
,, ...	Bulbs	10s a 12s
Cochin ...	Finger	13s a 14s
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in.	12s a 20s
Mauritius, 2nds...	Foxy & reddish 5 to 8 in.	9s a 14s
Seychelles, 3rds...	Lean & dry to mid. under 6 in. ...	6s a 8s 6d
Madagascar, 4ths...	Low, foxy, inferior and pickings... ...	3s a 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for May :—

"OILY AND FATTY MATTERS IN PLANTS."

IN dealing with the oily and fatty matters found in plants, we would best leave out for the present those oils known essential oils, a consideration of which will be taken up further on: the term oils will therefore for the present indicate true oils, or as they are variously named fatty, greasy, or fixed oils. Fats and oils fall under the large head of organic compounds known as carbo-hydrates, that is compounds consisting of carbon, hydrogen, and oxygen, in which the hydrogen and oxygen exist in the proportion required to form water. They are all glycerides, or normal compound ethers of glycerine, and can be formed by the action of an oily or fatty acid on glycerine. The most important glycerides are stearinc, palmitine, oleine and linoleine; the two former are white solids melting at 160° F. 142° F. respectively, the two latter are liquids. The ordinary fats—such as suet, lard, tallow—are mixtures of stearine, palmitine and oleine, in various proportions. The more stearine there is present, the harder and less fusible the fat; the more oleine, the softer and more fusible is it. Olive oil contains palmitine and oleine; almond oil, oleine with a little palmitine; linoleine occurs in linseed oil, hemp seed oil, poppy seed oil and other "drying oils," which when exposed to the atmosphere absorb oxygen, and are converted into a solid varnish. Castor oil consists almost entirely of ricinoleine. One of the main differences between fatty and oily matters is, it will be seen, in their consistency, which is regulated by the proportion of the compounds composing such substances. Oily and fatty matters in plants are numerous and widely distributed; nearly all plants containing one or more. Even cereal grain s—as oats and maize—contain oil in apprecibale quantities. Some plants contain waxy substances which give the bloom or shine to different parts of them. Again, some oils contain phosphorus, and are called phosphorised oils; such are the oils got from lupines, peas, and horse-beans. Fatty and oily matters are found in different parts of plants, but principally in the seed—as cotton-seed, linseed, sunflower-seed, &c. They are extracted by pressure, and the quantity obtained varies from ten to seventy per cent of the weight of the seed. Oleine is one of the commonest constituents of vegetable oils. Palmitine is found in palm oil, butter, and bees wax.

The essential oils differ greatly from the true or fixed oils, both in properties and in chemical composition. Unlike the latter they are volatile, non-lubricating, and possess powerful odours. They are obtained from many plants by distillation with water, the oil coming over with the water, and collecting in the receiver, partly dissolved in the water, partly floating on its surface, the watery solution having the odour of the oil. In this way oil (or attar) of roses and rose water, oil of lavender and lavender water, oil of cinnamon and cinnamon water &c. are prepared. Many of these oils, so different in odour, have the same composition as oil of turpentine, *e.g.* oil of lemons. Others contain various volatile substances; such are oil of mustard, and oil of bitter almonds, the latter containing the poisonous principle—hydrocyanic or prussic acid.

Of the true oils produced in Ceylon, the most important is coconut oil which is expressed from the dry kernel (copra) of the coconut by means of the ordinary native mill or checkko, and in a few cases by machinery: the oil specially intended for cooking purposes is however principally got by boiling the scraped kernel, while the clear hair oil made from the king-coconut is generally prepared from the scraped kernel by means of sun heat only. The ordinary oil which is largely exported, is used abroad for the manufacture of candle and soap. Soap is also manufactured to a small extent in the Island, and we were rather surprised by the enquiry for this "Ceylon coconut oil soap," as it was called, by passengers

f a French steamer who claimed for it the property of easy solubility in sea-water. Saponification or the process of soap-making is brought about by treating fatty or oily acids with caustic soda or caustic potash—the result being the production of a potassium or sodium salts of the fatty or oily acids, these consisting soaps. Hard soap has soda, soft soap has potash as a base.

Margosa or Kohomba oil is extracted from the fruit of the Nim or Margosa tree. This oil is largely used in Native medical practice. Gingelly oil is got from the gingelly or sesamum plant. Kekuna oil is expressed from the nuts of the kekuna tree, which contains about 50 per cent of oil. This oil is also exported, and is used in soap manufacture. Caju oil is expressed from the caju or cashew nut which contains about 4 per cent of oil. Mi oil is got from the fruit of the mi tree, and is used in native medicine. Castor oil from the castor plant is also produced in Ceylon to some extent.

Of essential oils, the principal is—Cinnamon oil distilled from the chips, bark, and in some cases from the leaves of the cinnamon plant. It is exported to a fairly large extent, and is used in medicine and for perfumery.

Citronella oil is distilled from citronella grass, and is exported for use in perfumery and for scenting soaps and pomatums.

Lemon grass oil, distilled from lemon grass, is made use of in the same manner as citronella oil, and to a large extent in the preparation of Eau-de-cologne.

Other less important oil-producing plants found in Ceylon are Mustard, Croton, Domba, Na (ironwood), Cotton, Pulun (tree cotton), Kon, Groundnut, Sunflower, Malabodda, Duhudu, Wetaerandu, Dorana, Murunga, and Kina.

OCCASIONAL NOTES.

It is with pleasure we have to record the fact of a new prospect being opened out to the students of the School of Agriculture. A Sinhalese gentleman, who is a large landowner of wealth of standing—but whose name we have no permission to publish—has signified his intention of employing agricultural students who have passed through the School of Agriculture with credit, on his estates, whenever he is in need of Superintendents. He offers liberal terms, and gives his intended employees an opportunity of becoming acquainted with the technicalities of the cultivation of special products before taking up the reins of office into their own hands. This offer opens out a happy prospect to those who are neither fortunate enough to be selected for Government employ as agricultural instructors, nor have facilities for carrying on cultivation on their own account.

Some time ago we referred to the advantages of employing passed students of the School of Agriculture, as pointed out by a private employer of one of our students. It cannot be doubted that the training, theoretical and practical, and the discipline under which the students are brought at this institution will result in making more intelligent and reliable superintendents and conductors of private estates than are found among the ordinary place-seekers of this description. We have more than once heard of a conductor, who as the result of confusion in his mind with regard to his instructions, has gone ahead working as hard as ever in a wrong direction in blissful ignorance he was doing damage (that was hardly to be remedied except at the cost of much time, expense and labour) to his master's property or crop. Now the average agricultural student can at least be trusted to exercise a good deal of discretion on his own account, and to bring the principles he has been taught in his class-room to guide him in a critical moment.

We will not dilate further on this subject for fear of being credited with a partiality for advertising ourselves. It is, however, a very gratifying matter to find gentlemen, such as the new patron of the School of Agriculture, appreciating the results of the work done here, and encouraging agricultural students by the liberal offers they make.

Why, it has been asked, is not all the teaching at the School of Agriculture carried on in Sinhalese instead of in English? True that by far the greater number of the students are Sinhalese, yet there are generally four or five Tamil students—the Burgher community having been for the past three years represented by one—to whom it would be a manifest disadvantage to be taught in Sinhalese—especially as the men from Jaffna and Batticaloa have so far proved themselves keen students of agriculture, and have always shown a determination to carry on agricultural work after leaving school. There is another objection in the difficulties that would come in the way of a lecturer or teacher doing justice to his subject in the Sinhalese language. If both masters and students were excellent Sinhalese scholars, these difficulties would tend to diminish in a degree; but yet it would be a hard matter to find expressions in the Sinhalese language that would exactly convey the meaning of scientific terms which crop up both in agriculture and the allied sciences taught at the school. It must at the same time be remembered that both the Sinhalese and Tamil languages are freely drawn upon to explain words or expressions whenever such a need arises. On the whole, therefore, it will be admitted that English has advisedly been chosen as the medium through which students should be instructed in agriculture at this school.

In Dr. Kynsey's address before the Ceylon Branch of the British Medical Association, the following appears among the "desiderata for improving the sanitary condition of the country and the well-being of its inhabitants":—"There should be a Veterinary department for the study of the diseases of animals. I believe much loss in the country districts could be saved to farmers by timely treatment of sick cattle, and by early destruction when they are suffering from contagious disease."

In addition to this, one might add another distinct advantage, from a Veterinary Department, and that is that there will be a number of men, qualified to inspect cattle and meat *as they should be inspected*, available for employment as inspectors of slaughter-houses and meat-markets.

The Grama Rakshaka Samagama held what was really their first Agricultural Show on Monday the 27th April at Dalugama; and if the Society does not meet with any serious difficulties—too common, alas, in the case of societies and associations in this country—and grows and extends its influence at a rate at which we can only hope it will, then will this date be a memorable one. The interesting features about the Show at Dalugama was that it was intended solely for the encouragement of native industry and enterprise, and that its object was purely a philanthropic one. For this reason it is unique in our agricultural record, for hitherto, however well the products of the soil have been represented at Agricultural and Horticultural Shows, one cannot help thinking that these Shows were merely nuclei round which to gather a deal of less useful and more frivolous amusement. They always lacked the real business air about them. We heartily congratulate the Samagama (and especially the Secretaries) on the signal success which characterized their first attempt at holding a Show. Agricultural Shows are very important agents in creating a healthy competition, as well as being incentives to industry; but if such Shows are to be held more frequently as has been proposed by the Government Agent of the Western Province with other recommendations worthy of attention—it would be well if, to a great extent, they were "built" on the excellent little model we saw at Dalugama last month.

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Rubiaceae.

49. *Hedyotis Auricularia,* L. Sin. Getakola, is a slightly woody spreading herb. This plant is commonly met with growing wild in waste lands and cultivated places. Its slender stem with many branches is swollen at the nodes. The leaves are small, green, and of an ovate shape. The flowers are very small and are borne at the nodes, where the small fruits are also produced.

The leaves of *H. Auricularia* are used in preparing a dry curry, but it is not much used as a food. The plant is believed to possess cooling properties, and is used to some extent by native medical practitioners in treating cutaneous diseases.

50. *Ixora Coccinea.* L.,

is a tree found throughout the Island, growing in both cultivated and uncultivated land. It is abundantly found in the vicinity of streams. The general growth of the plant is a shrub, but it is also found as a tree with well-defined large stems. The stem is much branched and covered with green leaves of an ovate shape, and of a rather leathery texture, the viens being slightly prominent. The flowers which are red with a thin tubular corolla expanded into four petals, are borne in large clusters, which give a characteristic appearance to the trees. A large quantity of nectar is found in the flowers of ixora. The fruits which are borne in clusters are of the shape and size of Ceylon black berries (Dan). They are green and have an astringent character when immature, but turns soft in texture and black in colour when ripe. The ripe fruits are of a sweetish taste, and are often eaten. The wood of this plant is of a hard texture, but as it does not generally attain to a great height, its timber is not much used except for handles of mamoties and other agricultural implements. The flowers of this plant are reputed to contain properties of purifying the blood.

Compositae.

51. *Emilia Sonchifolia.* D. C. Sin. Kadupara, is a herb found growing in the warmer parts of the Island in cultivated gardens and waste places. It has simple amplexicaul leaves with divided margins. The whole leaf is of a light green colour and is covered with glossy hairs. The leaves are found to vary according to the fertility of the soils where they grow as well as according to the condition of the climate. The flower-heads are small in size and are borne on a slightly long peduncle.

The leaves of this herb are used as a vegetable. They have a slightly acid character, and when made into curries this acidity gives the preparation a pleasant taste. The leaves are said to possess cooling properties, and are used externally in cuts and wounds and also in cases of serpent bites.

Sapotaceae.

52. *Bassia Longifolia.* Sin. Mi.

This is a tree which grows in the warmer parts of the Island up to high elevations. It attains to very large dimensions, and is covered with dense foliage. The leaves are long and narrow; their margins are entire; and the veins are prominent. The leaf is of a tough texture. The flowers are borne in abundance. They have thick fleshy calyces and are of a whitish appearance, with a peculiar smell. The Bassia trees flower once a year during the months of May and June, when in many parts of the Island trees are laden with blossoms and the ground strewn with the flowers, while large swarms of bees always resort to the trees at this season. The fruits are formed in July and August, and they much resemble the fruits of the small varieties of mangoes both in their appearance and in their arrangement on the trees. A fruit generally contains two seeds, but it is not uncommon to meet with those containing three to four of them. The fruits when ripe are much liked by birds, especially parrots and flying-foxes. The seeds are about an inch in length tapering both ways and thick in the middle: they are covered with a smooth brittle integument.

The seeds contain a large quantity of oil in them, which is extracted by the villagers.

A sugary syrup is manufactured by boiling the juice of the bassia flowers, and is used in the preparation of sweetmeats. This syrup has rather an unpleasant taste and smell, to those who are not accustomed to its use. The dried flowers are pounded and made into flour which is also converted into sweetmeats.

The fleshy portion of the young fruits of the Bassia is cut into slices and made into curries. Bees collect large quantities of honey from the flowers for their hives. The timber of this tree is used in house building as well as in the

construction of bridges. The juice of the Bassia leaves along with coconut milk is used in cases of burns and for allaying rheumatic pain. The astringent bark is used in fever and also to promote apetite. The oil extracted from the seed is used externally.

AGRICULTURE IN THE NORTH.

Sir,—Since the abolition of the tax on dry grains, many suggestions have been thrown out with a view to encouraging a more extended cultivation of these products; and it is gratifying to read that the Agriculturists of the North are as busy as ever preparing their lands for these crops, and that in all likelihood a good outturn will follow. This is very encouraging news to those who are interested in the affairs of Jaffna, and it is all the more cheering after the late reports of the failure of the paddy crop. When the tax was about to be abolished, it used to be thought that such a relief will bring about a careless and indifferent disposition in the cultivation of dry grains. Happily the reverse has been the case!

The Jaffna cultivator needs no instruction or direction for the raising of dry grains, for the reason that by long experience he has arrived at the most improved methods of cultivating such products; but where he does need help and special guidance is in fruit culture and gardening, for which, though he has a soil of great capabilities, he has little taste and enterprise himself. While thinking over the opportunites for improvement in this direction, by a strange coincidence the *Ceylon Patriot* of the 10th instant, suggested in its columns the idea of establishing Experimental Gardens throughout the Island, and specially recommended the formation of a Board of Agriculture in Jaffna. The *Patriot* goes on to say that "A competent Agriculturist should be in charge of each garden nominally under his local superior, the Government Agent, but responsible to the Director (of the Peradeniya Botanic Gardens); and these professional men attached to these gardens should, in addition to keeping their gardens in the highest state of efficiency, try their utmost to spread a knowledge of the improved method of cultivation, and send annual or quartely reports to the Director as to the state of their gardens, with remarks and suggestions of their own, as to the economic plants and vegetables suitable to the soil of their gardens, putting in their requisition for such plants as are not obtainable locally and generally; keeping the Director duly informed of every thing which in his opinion will be of benefit to the people. Now that through the laudable exertions of Mr. Green, a batch of graduates are annually turned from the Agricultural School, with a competent knowledge of their subject, their services can be engaged for a trifling sum compared with the enormous expense necessary to get down Agriculturists from England or the Continent."

With regard to the Board of Agriculture, the *Patriot* delivers itself as follows:—

"Devoid, though he (the Government Agent) be of scientific knowledge and training, he will be the means of doing great good if guided by a competent and responsible Agriculturist. The whole force of headmen can be held in leading strings and made *nolens volens* to spread a knowledge of improved gardening and cultivation of economic plants throughout their respective divisions. To aid the Government Agent and advise him in all important matters, the formation of a Board, consisting of the chief headmen of Jaffna and a few of the leading landed proprietors, independent of Government, will be a very desirable step.

It may thus be inferred from these remarks of the *Ceylon Patriot*, representing as it does the interests of the Tamil community of the North, that the inhabitants of the Jaffna Peninsula are not reluctant to adopt any useful plan that may be suggested and appear practicable.

One good result such a system as the *Patriot* suggests will be the breaking down of a good deal of selfishness and conservation that clings to the northern cultivator. Take for instance the growing of grapes which is so limited in extent, for the main reason that the secret of their successful cultivation is jealously kept by a few who are loth to proclaim it to their brethren. In this connection I may mention the advantages of such a publication as the Magazine of the School of Agriculture, in which there is at present appearing a useful contribution on the cultiva- of the Grape Vine.

Again, in the case of cucumber, cultivation is also confined to a comparatively few. The variety grown here has proved itself a profitable crop, and one for which there is an eager demand in the market, but its more extended cultivation is prevented by unworthy means (such as withholding seed or supplying bad seed) for fear that the result might be a disadvantage to a few favoured but selfish individuals.

It will thus appear that it is vey desirable that by some means,—whether through the School of Agriculture in Colombo or the Board of Agriculture at Jaffna,—a more liberal system of cultivation should prevail in the North, that there should be no obstacles in the way of procuring whatever seed is required, and that opportunities should be allowed for the existence of a healthy competition, which is one of the fundamental laws of Agricultural Industry.

I am very anxious that some effort should be made to establish these desirable results, which I doubt not will have the sanction of the Government Agent of the North (himself a successful cultivator of fruits), and it is for that reason that I have touched on the plan put forward in the *Ceylon Patriot*, and endeavoured to supplement and strengthen its remarks in urging the claims of Jaffna for more enlightened direction and supervision of its agricultural affaris.

I am, yours, &c.,
R. C. Muttiah.

Colombo, 18th April 1891.

THE CULTIVATION OF MANIOC.

(*Manihot Utilisima.*)

By W. A. De Silva.

The Manioc belongs to the order Euphorbiacea and thrives in warm regions. The original home of the Manioc is considered to be the New World, whence it has been introduced into eastern countries. The plant is in great repute wherever it is cultivated on account of the large quantity of food materials it produces in

a given space of land, when compared with other food products. Its introduction to Ceylon is attributed to the Dutch, who by the way have the credit of having introduced many useful food products which are commonly grown in the villages at the present day. According to Dr. Ainslie, the manioc plant was brought to Ceylon from Mauritius by Governor Van der Graff in the year 1787; and thus it will be seen that the plant has been in cultivation in this Island for over a century. This plant, like the other plants of the same family, possesses acrid properties, in addition to its containing a small percentage of hydrocanic acid. The characteristic smell of the cyanides being quite perceptible.

It has been found that there are above thirty different varieties of manioc grown all over the world, but these are considered to be only slight variations of two distinct species, *Manihot Utilisima* and the *M. Aipi*, the bitter and the sweet manioc respectively. The former variety has certain poisonous properties in it, in a raw state, while the roots of the latter are quite sweet and harmless. These varieties could be distinguished from their outward appearance by observing the leaves. The leaves of the bitter manioc have seven divisions, and the veins on the under surface are coloured red; whilst the sweet manioc possesses leaves with five divisions of a pale green colour.

So far as I have seen both these varieties are found in Ceylon, but the variety generally cultivated is a slightly modified type of the *Jatropha Utilisima*, the bitter manioc. In all countries this variety is preferred because it yields more abundantly. The bitter principles and poisonous characters of its roots are removed by drying or boiling.

The cultivation of the manioc plant is carried on to a large extent in the Western and North-Western districts of Ceylon. In many other districts it has rather a bad reputation as a food product on account of the poisonous properties which the fresh roots of some of the varieties possess, and on account of frequent deaths which occur by the careless use of the root.

The manioc is grown both in chena lands and in new clearings for coconut. It forms a very paying subsidiary crop along with the latter.

The plant is propagated by cutting the stems which give out buds from almost every node. In cultivating manioc, the land is prepared by hoeing and burning. Shallow holes are made with a mamoty four feet apart, or sometimes five, and two pieces of manioc cuttings from nine to ten inches long are placed in the holes and slightly covered with earth. These give out a large number of buds which grow with much rapidity. In planting manioc advantage is taken of a few slight showers, but when growing they are able to stand much adverse weather. The trees generally reach a height of from eight to ten feet, and after ten months they could be rooted out. The yams vary very much in size, and weigh from four to fifty pounds each. In good lands, the quantity of manioc produced is very large, but the average may be calculated at fifteen pounds per tree.

(To be continued.)

REFUSE MATTERS AS MANURES.

Horns, skin, hair, hooves and feathers are all of some value as manure. They are highly nitrogenous substances,—the amount of nitrogen present being the test of their value,—though they are very tardy in their action in the soil. Skin and hooves are not so refractory as the others mentioned; while feathers are particularly slow in decomposing. Skin refuse from tanneries when fresh is very valuable, but it is found often mixed with pieces of tanned leather which decompose very slowly. When made into composts, these substances decompose faster, and become much sooner available as plant food. Sulphuric acid is sometimes used for acting on them, and superheated steam is also employed; the great disadvantage in this latter process being the loss of ammonia which occurs with the escaping steam. For use in slow-growing crops the above are by no means to be despised. Blood as a waste material from slaughter-houses, is a highly nitrogenous manure and decomposes comparatively easily, while it is not easily lost by the soil. It is best applied after being dried and reduced to a powder, mixed with bone or other phosphatic manures.

Ashes from burnt wood, especially young twigs, contain a large amount of potash. Animal charcoal—the refuse from sugar manufactories,—is an excellent source of phosphoric acid, and should be applied ground for the best results. It is sometimes used for making superphosphate by the action of sulphuric acid. Soot which essentially consists of firmly-divided carbon and mineral matter, is valued for the fair proportion of ammonia which it also contains. Soot, besides supplying ammonia, absorbs gases and saline matter, while, by darkening the soil, it raises its temperature.

Gas lime—the refuse from gasworks—should not be used fresh, but must be exposed to the atmosphere for some time before applying.

Gas liquor might with advantage be used for saturating saw dust and coir dust to facilitate distribution.

Many of the refuse substances mentioned above are used by manufactners for making up artificial manures which are sold in the market under various names. The term guano has been used to designate many of these prepared manures. For instance, European guano, which is a very fair manure, is made up of blood, horn, urine, &c. that have been acted upon chemically, and converted into a powdery fertilizer. Frey Bentos guano owes its origin to Liebig's Extract of Meat Company, and is manufactured from the meat refuse into a good manure.

Fish guano, a nitrogeneous manure, much used in Scotland, is made out of the refuse from sardine and other fish-tinning works in Norway. Native guano, which can be traced back to sewage precipitation is, however, not held in much estimation. It will thus be seen that while a great deal of refuse matter is allowed to go to waste with us, it is used to advantage in other countries for making manures of a fairly soluble character, and convenient form for application to the land. The least that might be done by native agriculturists, who think so little of making a return to the soil they cultivate, is to form composts of such refuse matters as are available in towns,

for use on their lands. In this they have an example in the indefatigable Tamil grass-cultivator who will carry away whatever refuse matter he can lay his hand on—often of a useless nature —to place on his land.

AGRICULTURAL LITERATURE AMONG THE ANCIENT INDIANS.

By W. A. De Silva.

The diseases which attack vegetation are also dealt with by ancient Hindus, and particularly in the works referred to in my previous contribution. One cause of disease is stated in the following passage:—"Cold winds and scorching sun produce diseases in trees, and the trees turn light in colour and do not put forth new leaves, while the branches become dry and the sap leaves the tree."

The remedies given to meet these results, as well as the recommendations for producing luxuriance in growth, and inducing plants to flower and fruit freely, while they in some cases include measures by no means antagonistic to our modern ideas, generally indicate means, the adoption of which would in these days be considered the height of the ridiculous.

"To cure the plant of these diseases," says this ancient writer on vegetable Pathology, first scrape of or otherwise remove with the knife, the parts found dead on the tree; rub over these parts a mixture of Erycibe Paniculatum (a plant possessing the properties of a vermifuge), ghee, and mud; and pour at the roots water mixed with milk. If the fruits are inclined to wither, take a mixture of horse-gram, black-beans, sesamum seed and barley, and pour it at the roots:—this will bring about an increase of both flower and fruit. But here are yet more startling recommendations:—"To make trees fruit and flower abundantly, mix two measures of the excrement of the goat and ram with one of sesamum seed, half of rice flour, one measure of water and a hundred tulas or nearly a pound of cow's flesh; keep the mixture for seven days, and then water, creepers, plants, and trees."

A special compost for increasing the size of plantains is the following:—"Use as manure for the roots of the plaintain the excrement of the ass and the horse, burning dry twigs over the roots: the plaintains will produce fruit as big as the trunk of the elephant.

For increasing the size of yams:—"Dig a pit and burn inside it the dung of the cow and the hog; remove the ashes and fill the pit with earth. The root of the yam will be found to grow to a size sufficient to fill the pit!"

For producing a luxuriant growth:—"Mix with milk the marrow of the fish and the hog, as well as their flesh. Soak the seed of the plant in the mixture, dry it and expose it to the vapour of smoking ghee. The seed when sown will be found to spring up in an unusual and wonderful manner."

These quotations suffice to give one an idea of the nature of plant treatment in ancient works touching on agriculture. Absurd as many suggestions found in them seem to be, it will be noticed that nearly all the prescriptions greatly favour the use of organic manures for stimulating growth, such as carion, blood and milk. Both the first and second are not to be despised as manurial agents. A carcase is always an acquisition on cultivated land, and what is a loss to the stock-owner is a gain to his soil and the plant; while there are manures in the market which may be called "Meat Manures," for instance that prepared from the refuse matter in Liebig's Extract of Meat Company. In milk we have the most perfect food, as much so for the plant as for the animals, and though it seems ridiculous enough to use meat and milk for manuring plants, yet it must be borne in mind that the population of countries and the occupation of their inhabitants were not the same at that remote period as they are now, and that meat and milk could have well been spared for the purpose for which they have been recommended. It must at the same time be remembered that unacquainted as the ancients would probably have been with the secrets of artificial manures, they did the next best thing, viz., they returned to the soil the product of the soil, whether primarily as sesamum seed, rice flour, barley, &c., or secondarily as the flesh of the goat, cow, pig and fish (the last-mentioned common enough in Ceylon as "fish-manure").

In reading the passages I have quoted, some allowance will of course have to be made for exaggeration,—a common enough failing among ancient writers,—as well as for a dash of superstition (I can call it by no other name) in claiming peculiar virtues for special parts or products of a plant or animal—instances of which are very common among old writers, and are even found associated with old nations yet extant.

There is no doubt that most of the recommendations are based on experience. The composts which are prescribed are evidently meant to supply all the ingredients of plant food, as far as anything was known of this subject. In the mixtures of seed mentioned as composts, care is taken to advise that seed should be first heated or put by for a sufficiently long period to destroy all germinating power; the seed of plants is happily chosen as the storehouse of the most valuable materials in the plant, while the selection of seeds for the mixture is by no means a bad one.

But here I must stop for the present, reserving for another issue of the Magazine a consideration of still more curious recommendations relative to agriculture.

SOILS AND MANURES.

Mr. Robert Tatlock, F. I. C., F. C. S., in a lecture on Soils and Manures, has been condemning in unqualified terms the analysis of soils as it is generally carried out by chemists. The composition of a soil, he says, does not necessarily throw any light on its value from an agricultural point of view, and no information short of a statement of the amount of valuable *available* material yielded by it during the period of, and under the conditions which obtain during growth, can be of service in this respect. Mr. Tatlock suggests a method for the examination

of a soil based upon the fulfilment of the conditions which occur in practice, as nearly as they can be attained. It is as follows:—

"Take a stout tin or zinc box of 2 cubic feet capacity, that is 24 inches deep and 12 inches diameter either way, and exactly half-way between the bottom and the open top insert a division or diaphragm of perforated zinc, which will act as a false bottom. Cut out in one block, neatly, a cubic foot of the soil, and slip it, surface uppermost, into the upper part of the box, its bottom resting on the perforated horizontal bottom of the box. Bury the latter, level with the ground, say, at the beginning of April, and let it remain till the end of September, when it will have received all the climatic influence of the surrounding soil during that period, including rain, which will percolate through it and collect in the bottom part of the box, carrying with it all the ingredients which have been dissolved. This solution is then analysed exhaustively. As 12 inches of rainfall will produce a cubic foot of liquid, there will probably not be sufficient room in the lower part of the box for the full amount, which may be double that or more, so that provision must be made for drawing it off from time to time, say, once a month. This can easily be done by having a piece of ordinary gas-pipe leading from near the extreme bottom of the box up through the diaphragm, and then through one of two perforations in an indiarubber cork, inserted air-tight in a common 10-gallon glass carboy, the other perforation being fitted by another piece of piping, which, on being sucked, produces a partial vacuum, and so the fluid passes over from the box to the carboy where it is stored. For convenience, the body of the carboy may be partially buried in the ground. It will give me great pleasure to place such an apparatus for trial on any land, if one of the members will be good enough to give me facilities for so doing, and to analyse the product. The ingredients found should be calculated not only to per cent. of the soil, but to lbs. per acre, and compared with the amount of each of these removed from the same area of soil under favourable circumstances, by such crops as are intended to be grown. Of course, the full amount dissolved out will not be available for plant food, perhaps not one-half of it; but nevertheless, the results are a measure of the amount of the ingredients rendered soluble and assimilable, and consequently of the chemical value of a soil.

"Methods of analysis based upon the solubility of the essential ingredients in acids, more or less dilute, are arbitrary, and not to be trusted, as the conditions are totally different from those under which a soil gives up its useful constituents during plant growth."

And yet Mr. Tatlock considers,—and he thinks that every agriculturist and chemist, who has given his best attention to the subject will agree with him in this,—that no chemical analysis of a soil, however carefully carried out, and however exhaustive it may be, can be of the same value for practical purposes, as field experiments with various manures, systematically carried out by the farmer himself on his own land. This, he says, is simply a method of ascertaining what will suit a portion of actual soil in a particular locality, and consequently, what will suit the whole of it; and demonstrates what ingredients give the best results, in what propotions they should be employed, how they should be applied; whether together at the same time in a mixed state, or separately, and at different times; and finally, it will show the cost in practice. Another advantage claimed for this simple system is that it requires no knowledge of chemistry. Properly regulated experiments, or "trials" should be part of the work of every farmer, in which a well-arranged series of tests should be well thought out, committed to paper, and carried out, the weighing of the manures, the seeds, and the products or crops being accurately recorded in a book kept for the purpose.

The above remarks on the value of analyses of soils, coming as they do from a professional chemist, cannot be said to be made from any interested motives, and are well worthy of serious consideration, while too much value cannot be placed on the recommendation that each individual cultivator of the soil should carry on his own "trials" and carefully note their results.

GENERAL ITEMS.

Mr. L. P. Jayasuriya, Schoolmaster at Rupaha, in sending a specimen of stone, writes:—This stone found in Rupaha, Walapana, is known as Garundagala, and is of three varieties, viz., Nilgarunda, Kalugarunda, and Kirigarunda. The following is translated by Mr. H. S. Dias, of the School of Agriculture, from a communication to the *Lakrivikirana* newspaper, by Mr. Jayasuriya:—

"There is a stream in the village called Udapalata-Rupaha in Walapana which arises from a lake a little beyond Ragama, and flowing for about three miles eastward, falls into Rupas Oya near the village Rupaha. At a distance about $2\frac{1}{2}$ miles from its source the stream flows by the rock known as Garundagala or Garundapasana. The natives claim healing properties for this stone, and Brahmins come all the way from India in search of it, making pilgrimages such as are made to Adam's Peak. The pilgrims generally stay a few days near the spot, and after having performed certain ceremonies, they carry away specimens of the stone as souvenirs. I have been assured by the natives that they have used the stone as a remedy, and found it efficacious in many diseases, and in part I can corroborate this statement from my own experience. It is said to cure the skin disease known as "itch," and is used as a remedy for snake-bite, and for stomache-ache, and for inducing secretion of milk in females after confinement, the stone being prepared for internal use by grinding some of it into a fine powder and mixing with lime juice. It is averred that those suffering from itch have been cured by bathing in the Nilgarunda Oya, and that abdominal pains have been cured by drinking OF ITS WATERS."

Mr. J. T. de Silva, late of the Agricultural School, writes:—Pasdun Korale, in the Western Province, contains a fairly large number of vil-

lages. The land which is generally hilly is of a fertile character, as is evidenced by the general appearance of vegetation. The inhabitants are nearly all engaged in Agricultural pursuits, and the district contains a large extent of paddy land, but the soil yields nothing like what it should under a proper system of cultivation; yet the produce the people get by the unsatisfactory methods which they adopt clearly proves the good quality of the land. The majority of the inhabitants supplement their income by wages received for working in plumbago mines and on tea estates. The plumbago industry is carried on to a large extent in the district, and though the workmen's wages are by no means high, yet, there are men found to undertake the unpleasant and tedious work required in plumbago mining. There are many Tea Estates in the Korale near the Kaluganga, and these supply a good deal of work to the people. But there is yet more land suited to paddy cultivation, waiting to be brought under the plough, and it will undoubtedly be a great boon to the inhabitants if an Agricultural Instructor be appointed to the district, so that they may become acquainted with the advantages to be derived by the use of new implements and the adoption of an improved system of cultivation.

In the last report of the Director of the Royal Botanical Gardens we read:—"The first flowering also of the coco-de-mer (Lodoicea Sechellarum) requires special notice. The tree is in its fortieth year, and examination of the immature flowers shows it to be a male. The inflorescence appeared at the end of June (1890), being put forth from the stem between the halves of the split base of one of the leaf-stalks. I regret to say it never got beyond the bud stage, some mischievous person having cut off the whole inflorescence soon after its appearance. We may, however, now expect the production of flowers each year."

Antiaris Toxicaria is the upas tree which yields *Upas antiar* a kind of green resin containing *Antiarin,* a poisonous principle. It is this resin which the Javenese use for poisoning their arrows. Curiously the exudation from the same tree grown in the Malay Peninsula is innocuous, as proved by examination of, and experiment with, a sample sent by His Excellency Sir Cecil Smith to Kew.

The earliest forms of Cinnamon occur in the Caniozoic or Tertiary period of geology. In the oligocene deposits found in Europe, the leaves of cinnamon occur in the clays and sandstones, and in some localities fossil specimens of the trees are associated with those of palms, the gum tree, acacias, custard-apple, lotus, camphor tree, and mimosa. Later on, cinnamon is found in the miocene deposits associated with the fig, vine, olive, ebony, and myrtle, thus proving the tropical character of the climate which prevailed over Western countries at that remote period.

The food of ants consists of insects, fruit, honey and honeydew. This last is a sweet liquid of a viscid description excreted by the aphides or plant-lice from a gland which is situated near the extremity of the abdomen, and communicates with the interior by two tubular filaments. The aphis is a curious little creature which blights our plants and trees, and though it is an enemy of ours it is a great friend of the ants, more especially young ants. It increases in numbers with wonderful rapidity by a process of parthenogenesis, and it will be noticed that wherever plant-lice abound ants are always present. The ant greedily devour the sweet excretion from the aphides, while they can also be observed to stroke and caress these plant-lice till the latter voluntarily exude the coveted liquid. In fact the ant "milks" the aphis, and the latter is therefore with reason called the ant's cow. It is even stated that ants keep aphides in their nests for milking purposes. It a common mistake among some to suppose that ants destroy plant-lice by feeding upon them. The aphides, which live upon the juices of plants, belong to the sub-order Homoptera, to which also belong the *Coccidæ* or scale insects and the *Fulgora* or fireflies.

Mr. Baumgartner, Assistant Government Agent of Matara, has left his station on furlough, much to the regret of the inhabitants of the Matara District. He has made himself conspicuous among Government officials by the interest he took in Agriculture and Horticulture, as well as in the welfare of the people generally. Before leaving, Mr. Baumgartner sent in a complete and excellent collection of specimens of the raw and manufactured products of his district for the Imperial Institute.

The following articles have been received for the School of Agriculture Museum:—Samples of fine grains grown in Kolonne Korale, Rakwana, from Mr. T. W. Goonewardene; an old porcelain plate, and a Kandyan lacquer plate, from Mr. T. B. Pohath Kehelpannala; specimens of Garundugalla from Walapana, from Mr. L. P. Jayasuriya and Mr. H. D. Lewis; a beautiful stalactitic specimen of caju tree gum, four feet four inches long, from Mr. J. P. Ranasinghe.

We have to acknowledge copies of the Jaffna College Miscellany, and the number for March and April of the St. Thomas' College Magazine.

Mr. Manchanayake and Mr. Cooray, late of this School, having both got appointments under the Straits Settlement Government, have left Ceylon for Singapore.

Among the more notable Exhibits at the Grama Rakshaha Samagama Show held at Dalugama on the 27th April, were a young buffalo, 3 years old, covered with fine greyish hair, said to be cross between an Indian and Ceylon buffalo; some splendid coconuts of enormous size sent by Mr. Valerian Perera and Mr. John Ranasinghe; 3 uncommon-looking mangoes, of a reddish hue like those commonly met with in North India, exhibited by Mr. D. M. D. Alvis; and a bunch of gigantic plantains by Mr. Weerakoon,

THE

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THE CEYLON TEA FUND AND THE KIOSK.

WE call attention to the following forcible letter from Mr. Wm. Mackenzie condemning the proposed Colombo Tea Kiosk *in toto* and calling for a reduction in the subscription to the Tea Fund. Mr. Mackenzie thinks the Kiosk will be worse than useless if the object be to ensure better tea to visitors than, on the average, is got by them at present in the hotels, and knowing the difficulty in our own experience of getting native servants to serve two successive pots of tea of equal infusion, we are inclined so far, to agree with him. But surely tea-drinking was not the sole purpose of the Kiosk? Is it not to be as well for the sale of packets of pure Ceylon tea, to the numberless visitors—Cook's tourists included—who pass through Colombo from all parts of the world. Mr. Mackenzie is wrong even in thinking that all the Australians or Americans have been reached. There are many still to whom pure Ceylon Tea in an unknown beverage. There is something enterprising and attractive too in putting an ornamental Kiosk to advertise Ceylon Tea in the very forefront before all passengers as they emerge from the Colombo jetty. We want them to carry away as their first and last impression that *tea* is the most important of Ceylon products and the pure article the only tea worth drinking. A year or two of the Kiosk can, at least, do no harm! and after that if the Ceylon Tea Fund Committee have no more worlds to conquer, they must gracefully disappear from view, selling the Kiosk and its good-will and placing their funds for the endowment, say, of a Convalescent Home for Planters. One word as to the leading "official" Planters who now condemn the Kiosk—why did they not speak out before? The general public like ourselves look to all "official" planters as the responsible leaders in such a movement, and if they do not dissent at once when a proposal of the kind is made, we refuse to give them credit afterwards for wisdom or prudence. They rather merit condemnation.

THE CEYLON TEA FUND AND THE KIOSK.

To the Editor,

Colombo, April 15th.

SIR,—In a para touching on the Ceylon Tea Fund Committee (see page 828) you write; "We cannot see how the business in hand can permit of any reduction of subscription at least this year; but we suppose the Fund is not to be continued for ever, or beyond a certain date," &c.

My principal reason for proposing a reduction is that the Fund is now so large that in order to get rid of some of the money, the long proposed Kiosk is to be erected. For what purpose? We are sending large shipments of tea to Australia now, and if we could afford to take prices similar to those paid in Australia for Indian teas lately, we might easily double our shipments.

Of Indian and Ceylon teas, about 9,000,000 to 10,000,000 lb will go to Australia this year, showing that no Kiosk is required to introduce our teas to that market.

Is the Kiosk likely to aid in getting China or Calcutta residents (almost our only passenger visitors, besides Australians) to drink our teas? If not, for whose benefit is it intended? It will hardly help us with Russians, French or Americans.

Then are teas at the Kiosk to be so much better than the much-run-down decoctions we get at the various hotels? I give the managers of these establishments credit for doing their best to serve good teas, and unless there be a European manager to see to the making of each separate pot of tea, I feel certain complaints will be as frequent as at the hotels.

But European management means a large expense, and, under its weight, there would be a yearly loss.

Then on the demise of the Tea Fund which you foresee, what is to become of the Kiosk? Even now, the Tea Fund Committee is not a trading body, and how is it to own and conduct the Kiosk?

If I could believe there was any chance of the Kiosk being a success, or of doing our trade any good even if conducted at a loss, I would be very sorry to do anything to cripple the energies of the Committee.

Or if the Committee had any large scheme on hand to which the money proposed to be spent on this Kiosk could be directed, I would not propose any reduction in the subscriptions.

But I have taken the opinion of many representative planters and have found no one who had a word to say in favor of the Kiosk, except that the money had been voted and therefore must be spent. I do not think because a folly has been proposed, it need be perpetrated.

Of the two leading members of the Planting community at present—*leading* because unanimously approved of for their present offices—one told me a few days ago he agreed with me, but as to the folly of building the Kiosk feared it was too late to stop it. The other said the same, and added he believed its erection would prove a *disaster*! Will someone give us the arguments on the other side?—Yours truly, WILLIAM MACKENZIE.

EXPERIMENTAL GARDENS IN THE NORTH.

A JAFFNA BOARD OF AGRICULTURE SUGGESTED.

The very interesting and instructive annual reports which Dr. Trimen, Director of the Botanical Gardens, is so punctual in issuing through the Government press for the information of the Public, have suggested to our mind a doubt as to the general utility of these gardens. A considerable sum is every year spent from the Public Treasury on what some consider a luxury, others an attraction and a sight to travellers, and all an ornament to Ceylon. Admitting the gardens to be a luxury and one of the attractive sights of "*the utmost Indian Isle*, Taprobane" where every prospect pleases, we are not disposed to indulge in a wholesale condemnation of the Gardens of which we are truly proud. In all magnificence of Oriental display, watered as the garden is on three sides by the largest river in Ceylon, the beholder in it for the first time is lost in wonder, when gazing on the sublime tropical vegetation in all its rank luxuriance, the plants and vegetables laid out in systematic beds, creepers with a wealth of buds and flowers outwining the lordly stems of more robust trees, the innumerable clusters of fruits varying in size and colour, the richest crimson blending with the ripest yellow, all inviting the passer-by, the melodious singing and twitter of birds which find a welcome abode among the innumerable branches—truly all these conspire to make the visitor believe that he treads on the sacred soil of the veritable Paradise of his forefathers. But a massive bungalow built in the Gothic style soon undeceives our visitor that the grand panaroma before him is but the result of scientific cultivation. What an agreeable surprise! Fact is indeed stranger than fiction. Such is the effect produced on a globe trotter who rushes through the world at Railway speed. But let us see, if apart from affording this transitory pleasure, the gardens cannot be turned to some profitable account. That the gardens have contributed in some degree to the benefit of the people there is no doubt, but is the little good they have been the means of doing in any way commensurate with the large outlay necessary for its upkeep? Have the gardens justified this expenditure? Cannot they be made to yield greater profit without unnecessarily increasing the expenditure? These are some of the questions which naturally suggest themselves to a thoughtful mind. Whatever doubt we may entertain on the first two questions, there can be none on the last.

We cannot at present lay our hands on facts and figures in connection with the gardens, but a few suggestions as to how they could be turned to advantage would not, we apprehend, be out of place.

To the three Botanical gardens, Peradenia, Hakgala, and Heneratgoda—the two latter branches of the first—we believe, with a trifling outlay, each Province contributing its quota, other experimental gardens on the same lines as those of the existing ones, can be added in the provincial capitals, each to be nominally under the respective Government Agents, but all controlled by the Director, for the time being, of the Peradeniya Botanical Gardens. A competent Agriculturist should be in charge of each garden nominally under his local superior, the Government Agent, but responsible to the Directors; and these professional men attached to these gardens should, in addition to keeping their gardens in the highest state of efficiency, try their utmost to spread a knowledge of the improved method of cultivation, and send annual or quarterly reports to the Director as to the state of their gardens with remarks and suggestions of his own, as to the economic plants and vegetables suitable to the soil of their gardens, putting in their requisition for such plants as are not obtainable locally and generally keeping the Director duly informed of every thing which in his opinion will be of benefit to the people. Now that through the laudable exertions of Mr. Green a batch of graduates are annually turned from the Agricultural Scho l with a competent knowledge of their subject, their services can be engaged for a trifling sum, compared with the enormous expense necessary to get down Agriculturists from England or the continent. If the Government is so minded, we think a "Department of Public Gardening" may be organised on the samo lines as those of the "Department of Public Instruction" and the greatest good can be done with the least possible expenditure. Apart from the Government gardens in each important town, there may be private Grant-in-aid-gardens receiving a small annual amount from Government, if they show good and satisfactory results.

We say advisedly that the Government Agent of the Province should be the nominal superviser of the Government Experimental gardens; for without his taking a lively interest in these projects, the experiment is doomed to failure. The Government Agent being the all-in-all in the Province the success or failure of a scheme depends entirely on his hearty cooperation or indifference. Devoid though he be of scientific knowledge and training he will be the means of doing great good, if guided by a competent and responsible agriculturist. The whole force of headmen can be held in leading strings and made *nolens volens* to spread a knowledge of improved gardening and cultivation of economic plants, throughout their respective divisions. To aid the Government Agent and advise him on all important matters, the formation of a Board consisting of the chief Headmen of Jaffna and a few of the leading landed proprietors independent of Government, will be a very desirable step. Such a Board in addition to giving the agent the best local opinion will also considerably add to the moral force of his actions. The Board may well claim to be a consultative assembly, but we do not see why the administrative and executive functions should not be vested in it. Whatever powers the G. A. and the Board may possess, in all matters of a purely scientific nature the Director should be the supreme authority.

One of the first steps the G. A. and the Board, are to take should be the starting of an experimental garden in a central spot where an inexhaustible supply of water could be secured. If the Putoor tidal well can be fitted with a large pump, we think there can be no other better ground for first operations than the plots about it. The water in the well is demonstrated to be practically inexhaustible and the analysis of the water has revealed many valuable constituents necessary for plant life. The soil is also good and suited for the ordinary plants and for the first start different varieties of cotton and tobacco may well be tried and seeds of the best variety in each distributed largely throughout the villages. As time goes on more valuable plants and fruit-trees may be cultivated and seeds and cuttings of these distributed to the people on their application with a small remittence which may from time to time be fixed upon by the Agent, and his Board. For the first one or two years the project may involve the Government in some expenditure but after that we are sure the garden will pay its own working expenses, if it will not leave a margin of profit for the Government. Breeding of different varieties of cattle imported from India, Aden, etc. may well form another industry connected with the Gardens and now that our breed of cattle is becoming degenerated owing to several causes, this suggestion should commend itself to our Rulers. We have put forward these suggestions for the consideration of those who have the interest of the people at heart and we have reason to believe that if things are only properly represented to our Government Agent he will give his best attention:—Jaffna "Patriot."

AMERICAN QUININE—Messrs. Powers & Weightman of Philadelphia, have issued a circular in response to the widespread reports that they had ceased manufacturing quinine themselves, and simply bottled and labelled foreign quinine as their own brand. They aver that they have never relinquished the manufacture of quinine since they first began t, shortly after its discovery some sixty or seventy years ago, and say that the work of making and packing it is all done by them in Philadelphia.—*Chemist and Druggist.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, March 25th.

CINCHONA.—Tho fortnightly auctions which took place here on Tuesday were rather heavier than their recent predeccssors. They consistod of:—

	Packages		Packages	
Ceylon cinchona	780	of which	633	were sold
East Indian cinchona	2,086	do	1,814	do
South American cinchona	475	do	177	do
Java	284	do	256	do
African West Coast ...	23	do	28	do
Total	3,653	do	2,908	do

The assortment was distinguished by the unusual predominance of East Indian bark, mostly from Beyporo and Calicut, and nearly all of recent import. The bulk of this consisted of Succirubra, including several parcels of very good chips and shavings, and there was also a fair quantity of Ledger bark, but the Officinalis barks were badly represented. The sales generally passed off flat and lower, especially towards the end, holders selling freely Some of the brokers at tho close of the sales declared that the prices obtained were absolutely the lowest ever accepted in public sale in London.

QUININE.—Tho market is dull, and no business reported. The nominal quotations are: Sellers 10½d, buyers 10d per oz., for second-hand German quinine in bulk.

PLANTING NOTES IN SOUTHERN INDIA.

Mr. Philip Home has a second excellent letter of advice to his nephew in the *Indian Planters' Gazette*, dealing with Calcutta Agents. He commences his letter by remarking that there exists between planters and their Agents a little—perhaps sometimes more than a little of what he calls race or class antipathy. "The causes of friction," he proceeds to say, "arise in a want of community of view."

This phrase hits the nail sqnare on the head. The planter is not a business man. A letter couched in the usual cautious business phraseology reaches him at the ond of a long anxious and harrassing day. He is tired and irritable. There is some sentence which reads to him as implying distrust or reflecting on his work. He takes up paper and pen. He does not 'beg to own receipt of the favour' nor 'has he the pleasure to bring to tho notice,' nor 'the regret to observe.' He writes briefly and makes his sentences crack and sting. The firm is to him an impersonality. By the time the 'stinker' is complete, his ill-temper and irritability, caused not by the Agents, but by the worries of the day have been worked off. Agents are human. They read in all probability merely what is written, not what is between the lines. Thoy retort, making some allusion to money matters. And the ruction grows.

That the planter as a rule is not a business man is generally admitted. He argues thus, to quote Mr. Home again, "what is the use in spending much of my time over vexatious accounting and correspondence with all the planting to look after and coolies coming in." There is some truth in this, but on the other hand, time should be found for accounts and correspondence, and failure and heavy loss has more frequently than not been due to the neglect of these. The Agents, sitting at their office tables, with their clerks and their peons, forget that letters and accounts are a very different matter when all the coolie work has to be done by yourself. Thoy blame the planers often unreasonably for their delay in forwarding roturns, and in replying to their letters. So here again is want of community of view.

"There is another cause," continues Mr. Home, which has set up antipathy between improvident planters as a class and Agents. A Manager works for some years, saves a little money and comes in, we will say, for a small legacy. He, with a couple of other men in the same position, takes up a piece of land and sets to work to make a tea garden. They open out beyond their means and borrow money from the Agents on the security of their property. They have a bad season, and misfortune comes in other shapes and forms. They get more and more heavily in on the wrong side of the Agents' books. They are foreclosed on, and the firm takes over the property, which backed by ample capital turns out a very good thing. The firm has done nothing but what is perfectly justifiable, but the man who opens the garden doesn't look at it in that light. It is gall and wormwood to him to see the familiar bushes, which he worked so hard over planting when seedlings, grown from seed bought out of his savings,—yielding profit to others. He stigmatises the entire agency fraternity as vultures and cormorants capable of every rapacity and meanness."

Just so. No matter whether the case is exactly similar to the above or whether it arises from reckless opening by an inexperienced youngster, or from unsuitable soil or a succession of seasons going from bad to worse.

Planters are apt to confuse the capitalist with the merchant. Taking it as a general rule, the former is prepared to let his money lie idle for a length of time, provided there is a reasonable chance of it bringing in a good return eventually. The merchant requires a good return on his money almost immediately either directly or indirectly. It is contrary to the first principles of mercantile rule to lock up capital for an indefinite period. An application is made for a loan. A merchant has a balance lying idle. By utilising it he sees it will bring in business. The estate, as time goes on, cannot pay its way, and he is not prepared to invest further money without the direct management of it. So, as in an example used by Mr. Home tho estate is taken over; more capital is sunk, with the result that a handsome profit accrues. But of more frequent occurrence are the cases when money has been lent, but hardly any return, except on paper, received. The merchant realises that he has made a bad investment; he is naturally anxious to get back as much of his money as soon as possible, he declines, as it seems to him, to throw good money after bad. He shows forbearance so long as he can afford to, and then forecloses. Can anyone fairly blame him?

More friction is caused in all these transactions. The planter, who has probably never borrowed before, does not realize how quickly interest mounts up. Items appear in his monthly account which he does not understand. All that is intelligible to him, is that they help to augment his debt He knows his ignorance and believe that it is being made use of to swindle him, and freely expresses these views. The Agents are frequently not even in their treatment of a borrower. At first they are too eager to see the property improved and high cultivation undertaken. Latterly they grow nervous and are in too great a hurry to keep expenses down to the lowest pitch.

Then too there are instances of planters taking advantage of the willingness of Agents to help they, to incur a debt which they cannot expect to pad; instances of agents placing cheque-books in the han s of a young planter with *carte blanche* to draw on them to any extent.

So the antipathy is fostered. More's the pity. If only both sides would realise and keep continually before them the difficulties, the embarrassments and the worries that surround the other; if only both would display a somewhat greater desire to forget the cases where the actions have not been quite according to Cocker, and to remember the much more numerous ones where consideration and kindness have been shown, how much better for all. The Agents are as necessary to the success of the planting industry as the planters, and the less the friction and tho antipathy between them, the greater is the success likely to be.—ST. LOUIS in the *Madras Times.*

PLANTING NOTES FROM PEERMAAD.

After an unusually boisterous land wind season followed by very hot and dry weather, splendid rain has fallen all over tho district, and has brought out very fine blossoms. so that all those who are still the fortunate possessors of coffee—alas! that their number has so terribly diminished—are particularly cheery, and

may well be congratulated on their prospects of a good crop in the coming season, which will, it is anticipated, more than make up for the pretty general cult ure of the crop of 1890-1891. Estates generally are in capital heart, and are looking better than they have done for years. A friend from the Periar writes me, "I have had three splendid blossoms, but I did not see a single hee, except during the last blossom, and then only a very few." This scarcity of hees seems general, and honey is consequently very scarce. The hill men say they have never known so bad a year. Tea is doing wonderfully well; several estates have yielded an average of 400 to 500 lb. of made tea por acre, for the past 12 months. "Arnakel" however 'takes the cake' with the fine outturn of 600 lb. Two of the largest properties have most complete steam machinery, and another younger estate is, I hear, following suit. All existing factories have either been lately, or are in course of being enlarged, and fresh land is being opened up on nearly all the estates—*verb. sap.* Most places have lately been pruned down and are only just beginning to come on again, but I have just heard that last week's ordinary plucking on the "Mai Mulli" Estate—one of the highest, by the bye, in the district—yielded an average of 70 lb. of made tea per acre. Money is undoubtedly being made, and there appears to be every sign of a return to the prosperity that the district enjoyed in the good old days of 20 years ago.—*Madras Times.*

THE POLICY OF DEPRESSING QUININE.

To the Editor "Chemist and Druggist."

Sir,—We note in your valuable article on "Quinine and Java Cinchona" the following sentence:—

"The avowed, if unintelligible, policy of at least one of the English manufacturers to depress quinine," &c., &c.

This is certainly news and fresh intelligence to

Yours, &c., HOWARDS & SONS.

Stratford, near London, E., March 21st.

In our correspondence columns will be found a letter from Messrs. Howards & Sons, taking exception, so far as their firm is concerned, to a paragraph in our Editorial Note of last week on "Quinine and Java Cinchona." The paragraph spoke of "the avowed, if unintelligible, policy of at least one of the English manufacturers to depress quinine." As Messrs. Howards & Sons deny having pursued such a policy, we, of course, accept their assurance as a fact. But we may, perhaps, be allowed to point out that the feeling that they did pursue a policy of depressing quinine has not been confined to ourselves. It prevailed very widely on 'Change and elsewhere in the early days of this year. In our report of January 3rd last we recorded that:—"Quinine . . . has been in good request, and prices improved slowly until today, when the market again became noticeably weaker. This morning it was announced that Messrs. Howards & Sons had reduced their quotation by 1d per oz., their brand in bulk being reduced to 1s 5d, and in vials to 1s 7d per oz. The announcement of this reduction appears to have created some surprise." Until Messrs. Howards reduced their quotation that day the price of German quinine was slowly creeping upwards, and speculative brands in second hands had advanced from 12d to 12¾d within a few days.

We may here point out that the figure 46,400, which is given as representing the production of nine cinchona plantations, should have been 464,000. Further, though this does effect the argument, the well known line runs: "All that we know is, nothing can be known," not "nothing can be done."—*Chemist and Druggist*, March 28th.

JAVA PRODUCE.

The exports of the principal drugs and spices from Java during the last five years (January 1st to December 31st) have been as follows:—

	1886	1887	1888	1889	1890
Cinchona Amst lb.	2,272,394	2,905,785	3,666,028	4,839,370	6,628,307
Cubebs pcls.	—	—	1 8	1,114	1,373
Pepper ,,	35,006	19,544	27,989	41,024	35,432
Nutmegs ,,	942	2,314	1,850	4,899	1,667
Mace ,,	107	356	549	698	306
Cloves ,,	925	355	131	1,741	306
Cinnamon and cassia pcls.	3,250	2,211	774	1,679	2,901

—*Chemist and Druggist.*

THE CEYLON TOBACCO COMPANY.

ANNUAL MEETING.

Of the annual general meeting of the Ceylon Tobacco Company Limited which took place yesterday at Kandy, we published a telegram last evening containing the general result. Today we are in a position to give a fuller report having received a copy of the minutes from Mr. A. Philip, the Secretary, which after the usual preamble, stated that the shareholders present were, the Hon. Mr. T.N. Christie, Chairman of the Board of Directors who presided and Mr. R. Boustead representing Mrs. Alice Page Boustead, Wattegama, Mr. A.G.K. Borron, Mr. David Fairweather, Awisawella, Mr. H. K. Rutherford, by his Attorney Mr. L. P. Fisher, Mr. Alexander Tait, Madulkelle, Mr. T. C. Owen (Director) Wattegama, Mr. Hugh Fraser, Matale, Mr. Alexander George Seton, Agrapatnas, Mr. C. Spearman Armstrong (Director) Hewahetta, Mr. James Hill (Director) Kotagala, Mr. J. Alexander, representing Mrs. Mary Parry Alexander, Mr. A. Philip, Secretary of the Company. The following gentlemen held proxies for shareholders absent:—Mr. James Hill for Messrs. Wm. Mills, Haputale, Wm. Hunter Reid, Rosita, Miss Mary C. M. Hill, Hon. T. N. Christie for Mr. Jas. Tennant Emerson, Mr. H. Drummond Deane and Mr. Charles Minto Gwatkin.

The notice calling the meeting the minutes of the last annual having been read and confirmed.

The report of the Directors was submitted by the Secretary as follows:—

The interim Report circulated to Shareholders, on 15th December last explained the unfavourable nature of the operations connected with the tobacco crop of last year, and the Directors have at present little to add to what was then stated. The final fermentation of the crop is now almost completed, and the tobacco will be disposed of as soon as possible. The only sample submitted to experts, has with some qualification been favorably reported on, but it is remarkable that Ceylon samples have been generally thought well of, and called forth encouraging reports and valuations, while, for some unknown reason, the sales of the leaf have, with few exceptions, been most disappointing and unremunerative. The Directors, though holding to the opinion that Ceylon tobacco can be grown to rival that of Sumatra in quality, have felt that they would not at present be justified in devoting the Company's money to extensive operations in connection with such an uncertain-priced product, when the fine quality of the lands owned by the Company afford every promise for the successful cultivation of products, which have been proved to be permanently remunerative. For this year, therefore, it has been decided to devote great attention to the formation of valuable cocount, cacao and tea estates, and only crop about 50 acres with tobacco to utilize the existing sheds. At Matale Estate, another 100 acres have been prepared, chiefly for cacao, and planting will be done whenever the S.-W. monsoon rains set in. That estate will then comprise over 200 acres of opened land, about ⅔ in cacao and ⅓ in tea. At Arampolla 200 acres have been cleared, and made ready for coconuts, bringing that estate's acreage of opened land to over 320—all in coconuts. On both these estates, Liberian coffee is to be extensively planted, interlined with cacao or coconuts. A new estate called "Ratwattie" is being formed on the Company's Ukkuwella land, and over 100 acres of fine land are now being put into tea there. The total expenditure on Arampolla, for the

year was R20,758·48, of which R4,842·78 were on account of the permanent product, and at Matale the total expenditure was R26,640·00 of that R14,490·43 were on account of the permanent product.

BALANCE SHEET OF THE CEYLON TOBACCO COMPANY, LIMITED.

Made up to 31st December 1890.

Capital and Liabilities.	R	c
I. To Capital :—		
2,185 Shares, of which 476 fully paid up ..	47,600	00
Do 2 at R70 do ...	140	00
Do 1,588 at 50 do ...	79,400	00
Do 56 at 20 do ...	1,120	00
Do 63 at 10 do ...	630	00
	128,890	00
II. To Debts due by the Company :—		
Balance due to Superintendent ...	1,884	90
Auditor's fee	100	00
	1,984	90
	R130,874	90

Property and Assets.	R	c.
III. By Property Immovable :—		
Land Purchased as per last Report ...	16,095	92
Land Purchased this year from Fritz Meyer	47,600	00
Notary's Fees, Examination of Title, and Inspection of Lands	2,675	36
Proportion of Expenditure and Permanent Works on Matale and Arampolla estates	19,333	21
	85,704	49
IV. By Debts due to the Company :—		
Bandarapolla Clearing	505	00
Joseph Holloway Advances on Land Purchases	9,165	80
Sundry Debtors	312	00
	9,982	80
By Suspense Account :—		
Kantalai Fees and Extra Visiting ...	602	50
By Value of Tobacco Seed Estimated ...	300	00
V. By Cash in Chartered Mercantile Bank ...	2,001	21
VII. By Profit and Loss :—		
Balance	32,283	90
	R130,874	06

PROFIT AND LOSS AS AT 31ST DECEMBER 1890.

Dr. 1889 Dec. 31st.	R.	c.
To Balance brought forward	2,919	40
1890 Dec. 31st.		
„ Expenditure on Matale Estate, less advances of 40/ recovered	12,109	57
„ Expenditure on Arampolla Estate ...	15,915	70
„ Auditor's fee : 1889, R52·50 ; and 1890, R100...	152	50
„ Preliminary Expenses	304	75
„ Directors' Expenses attending Meetings ...	675	00
„ Stationery and Printing	103	95
„ Postages and Petties	265	18
„ Secretary's Salary, use of Office & Office Expenses	1,004	96
	R33,451	01

Cr. 1890 Dec. 31st.	R.	c.
By Profit on Tobacco Seed	329	68
„ do on Rice	370	58
„ Interest from Bank	455	35
„ Sale of Cotton	7	00
„ Recovery for Tools lost	3	00
„ Transfer fees	1	50
„ Balance	32,283	90
	R33,451	01

Audited and found correct, JOHN GUTHRIE.
E. & O. E., Kandy, 28th March 1891. A. PHILIP, Secretary,

In moving the adoption of the Report the CHAIRMAN remarked that in consequence of the want of rain the tobacco crop harvested was not as large as was anticipated and the quality was disappointing but the present prospects of the company since its formation were satisfactory and experts consulted had with some qualification reported favorably on the samples of tobacco leaf submitted, as would be observed. Ceylon tobacco had failed to realize the price of Sumatra tobacco. The Directors are unable to fathom the reason of this but it should be remembered that Ceylon tobacco is a young product. It was possible that the system of manufacture in Ceylon might require some modification. The Company however, being in possession of some very fine lands have therefore decided to devote attention to forming valuable coconut and cacao and tea estates. The Company's interest in tea would be comparatively little in this respect differing from many of the other agricultural Companies. The Company would not be entirely dependent out on tea, its interest in that product being no more than ⅕ or 1-5 in his opinion the Companny will in course of a few years prove to be one of the best and soundest in the colony. The Company owns some of the fine lots of land between Katugastota and Matale, land which is beginning to be more appreciated daily, and the soil of which is of very valuable quality. The Company has a lot of cacao on Matale Estate 50 acres already planted. The land certainly was of very fine quality and should make a very valuable estate. The Directors felt some disappointment at the tobacco but he had great hopes for the Company and did not think that he was unduly sanguine in anticipating that the shareholders would ultimately receive good dividends; even if not successful in tobacco the Directors believed that they would make it successful in other products. Mr. Christie, Mr. Hill and Mr. Owen were leaving the Island Mr. T. C. Owen retires by rotation but is eligible for reelection, but they would wish rather to remain as Directors as otherwise Mr. Armstrong would be left to act alone on the Board of Directors. The shareholders were not to suppose for a moment that the Directors were leaving a sinking ship owing to the coincidence of a temporary absence.

Mr. ALEXANDER and Mr. BORRON suggested that it might be convenient to put any questions before the adoption of the Report.

The CHAIRMAN having replied to Mr. Borron's questions, Mr. Hugh Fraser desired to explain his position and made some observations on sales of Ceylon Tobacco in the London market and on the prospect of tobacco growing in Ceylon.

The CHAIRMAN replied at some length to Mr. Fraser's remarks and those of other shareholders and having taken the sense of the shareholders on the matters submitted for consideration he put the Report to the meeting when it was unanimously adopted.

A resolution proposed by Mr. ALEXANDER TAIT and seconded by Mr. D. Fairweather :—"That the remuneration for 1891 of R1,000 per annum be paid to the Directors," was unanimously carried.

It was proposed by Mr. A. G. SETON and seconded by Mr. J. ALEXANDER :—"That the retiring Director Mr. T. C. Owen be re-elected and that in view of the absence at home for sometime of some of the existing Board, Mr. Crawley-Boevey's name be added" and this was also carried unanimously.

Mr. J. ALEXANDER proposed and Mr. A. G. SETON seconded :—"That Mr. H. Drummond Deane's name be added as a Director."

Mr. SETON rose to express the satisfaction he felt after having visited this morning the Estates of the Company at Matale and at Ukkuwella, he felt sure that erelong the shareholders should do uncommonly well in possession of such properties.

Mr. ALEXANDER moved a vote of thanks to the Chairman of the Board and to the other Directors, this was seconded by Mr. A. Tait, and was unanimously carried.

This concluded the business of the Meeting.

CINCHONA IN BRAZIL.—There is a cinchona plantation, it appears, at Theresopolis, in Brazil, which contains already over 20,000 trees. Analyses of the bark produced there are said to have shown an average equivalent of 1·92 per cent of quinine sulphate. The Brazilian Government have instructed Professor W. Michler of the Rio Polytechnic School, to make a series of fresh analyses of the Brazilian bark and report upon the prospects of the culture.—*Chemist and Druggist*, March 28.

COCONUT SUGAR.

Hyderabad Estate, Batticaloa,
November 27th, 1849.

Messrs. Lemarchand & Co., Jaffna.

Gentlemen,—I am in safe receipt of your favor written in reply to the questions addressed to you, and I beg to offer my very best thanks for the same, conveying as it does, much new and valuable information about the subject which is now occupying a great deal of my attention. I neglected writing till I could more satisfactorily give you a kind of result of our trials, and from which I hope you may draw the same conclusions that I have. As for the palmyra toddy, I consider that at present the most important affair in Jaffna, and only wish I could have a chance to try what could be done, I myself think that the fact of the season beginning and ending in 3 or 4 months a great advantage indeed. I make no doubt that the paane could be purchased from the natives at a remunerating price, and that they would get to prefer so selling it, to making that abominable compound, which they do now. I have proved that paane can be brought always in all seasons, in the hot sun or rainy weather, in the land wind or monsoon, $5\frac{1}{2}$ miles in chatties on coolies' heads, not reaching me till 4 p.m., and yet not suffer any deterioration whatever, and that from it, however highly limed it may be, a most superior quality of muscovado sugar can be made. The weather is now so very rainy that I can do nothing, but when it clears a little, I will try and get some more and make you a sample. Even that excellent sugar you sent me deliquesced considerably on the way, and I am afraid that mine, being still only muscovado, would do so entirely, still I chance a few grains in this letter. Our experiments are not yet sufficient to determine precisely whether bark or lime would be used; but in consequence of a recent discovery I am inclined rather to the latter, as there is then no risk of fermentation taking place. This day a paper on the subject, with samples, goes to the Asiatic Society, whom I have requested to have a full report thereon made and sent to the papers. I have little doubt they will do so, and then you will see the whole detailed, as far as we have yet gone.

I am curious to hear what the Jaffna planters say, and if they have tried it as yet on any of their bearing trees; also, if they anticipate that we shall have any difficulty in obtaining toddy-drawers. A friend writing from India affirms that we shall not, but that any number can be procured from Mysore, Tanjore, &c.

My brother has made a very fair trial on two small trees having tried them 2 months, (7 paales were cut altogether on the two trees; 8 might have been cut, but one was left in the middle of the experiment, and now he is letting the trees run to nuts, as a further proof, each proceeding paale was uniformly larger than the one before, and yielded more toddy.

The last cut trees yielded the most. A paale will run 40 days' cutting twice a day. With lime, the toddy may be taken down once in 24 hours, and in the evening the paale only stirred. The *first* 30 days the two trees yielded on an average $3\frac{1}{8}$ pints each per day. The *second* 31 days they gave

$4\frac{1}{8}$
—
$2)7\frac{1}{2}$
—
$3\frac{3}{4}$ average.

But it is a question whether the first month should be counted. Thus a tree seems to be able to acquire as it was a *habit* of giving toddy; and probably the more it is cut the better. The paales which have come out since have abundance of nuts now on the flower stems, adding the $\frac{1}{8}$th for the paale nuts cut we have, on the average of the two months about 180 gallons per annum from a tree, and taking the second month, over 200 or rather exactly 200. I am sure this is much more than any one expected. In all the processes I see no difficulty which may not be overcome, or rather which has not been overcome, and on the first December we hope to start, with 50 trees, but that depends on whether we can get a certain pail made.)

I have only further to say that if any planter in Jaffna wishes for information or any particular point which I can afford, I will do my best to afford it him. I dare say they already number among them some sugar planters. I have a book by a Mr. Whitehouse of Jamaica. Is he any relation to your son-in-law?

But it is possible, as I am acquainted with most of the late discoveries, &c., or rather improvements in the art, that something may occur, if they really wish to try and if in time for next palmyra season; if anyone thought seriously of it, I would be willing to come to Jaffna (if could get leave) and assist them to erect any works necessary or forward any plans or sketches of the same on remunerating me a trifle for the loss of time. There are some things particularly needed by this paane (as it seems now) rather different from what is necessary in the case of cane juice; but, if any one procure and boil some paane, they will soon see it. As our paane averages 9·5 Beaume, there is no fear but every gallon will yield a pound of muscovado sugar, and my trial leads me to think that $1\frac{1}{2}$ lb. may be looked for. None of my experiments have been quantitative ones; it cannot be done in open earthen chatties.

As to the refining of the Jaggery, it can be done; and I have done it, but how much better to act on the raw material! Notwithstanding, when the season opens, I will ask you to buy and send me some for a trial on a large scale, say, perhaps, a ton. I will advise you of this.

Meanwhile, please make this quite public. I shall have no secrets, though of course the practical part of the business can never be explained, it must be seen and experienced. The cost of apparatus, however, will not be very great. If any one is going to set about it as I said in time for the palmyras, they should lose no time.

A few lines in acknowledgment will be esteemed a favor. Please tell me if the sample arrived at all presentable, and, if so what the sequel is priced at? If it is really in good condition when you get it, Perhaps you would let Mr. Dyke see it? Perhaps you have heard also something or other new on the subject since. By-the-bye, you omit to say which sized baskets are sold 300 for a shilling. I should like to know the nett weight (minus baskets) of a given number of baskets, their size, and price. You do say 8 to 10 baskets one pound weight, but not which kind size is here specified. We have not got to make such good sugar, I think when Capt. Reddie was here; this is made by a new process discovered lately.

With many thanks, I remain, Gentlemen,
Yours faithfully,
(Signed) J. GLANVILLE TAYLOR.

FIXATION OF FREE NITROGEN.

The subject of nitrogen in its relation to vegetation has occupied the attention of agricultural chemists, more or less, for nearly a century, and it is just about half-a-century since a Boussingault commenced experiments to determine whether plants did assimilate the free nitrogen of the air—his conclusions being that they did not.

Thirty years ago a series of experiments on the same subject was commenced by Lawes and Gilbert at Rothamsted, the results of which confirmed those of Boussingault. The authors then stating that in view of the evidence afforded of the non-assimilation of free nitrogen by plants, when grown under conditions of sterilisation and of enclosure, it is very desirable that the several actual or possible sources whence they may derive combined nitrogen should be more fully investigated.

Since that time the question of the sources of the nitrogen of vegetation has continued to be the subject of much discussion and experimental enquiry, both at Rothamsted and elsewhere. But during the last few years, however, the discussion has assumed a somewhat different aspect. The question still is, whether the free nitrogen of the air is an important source of the nitrogen of vegetation; but whilst few now assume that green-leaved or chlorophyllous plants directly assimilate free nitrogen, it is never-

theless supposed to be brought under contribution in various ways. Coming into combination—by the agency of electricity, within the soil, or within the plant; or under the influence of microorganisms, or of other low forms, either within the soil itself, or in symbiotic growth with a higher plant.

In July last, Professor J. H. Gilbert delivered a lecture at the Royal Agricultural College, Cirencester, in continuation of a series on the results of experiments at Rothamsted with different crops, taking, as his subject, the "Fixation of Free Nitrogen," and giving a description and some of the numerical results of experiments made at Rothamsted in 1888, a description, and some illustrations of the growth in 1890, and also a brief account of the experiments still in progress. This lecture, with additions, has now been published, and the following abstract may be taken as giving the main conclusions:—

How is the Fixation of Nitrogen to be Explained?

Revising the whole of the Rothamsted results there can be no doubt they are abundantly confirmatory of those obtained by Hellriegel and Wilgarth, which are, that plants of the gramineous, the chenopodiaceous, the polygonous, and the cruciferous families, depend on combined nitrogen supplied within the soil; while leguminous plants do not depend entirely on such supplies. Also, that the fact of the fixation of free nitrogen in the growth of Leguminosæ, under the influence of suitable microbe infection of the soil, and of the resulting nodule formation on the roots, may be considered as fully established. Although, as Sir J. B. Lawes and Dr. Gilbert admit, we must obviously know more of the nature and mode of life of the organisms which in symbiosis with the leguminous plant bring about the fixation of free nitrogen, before the nature of the action can be understood.

It is a point of importance that it should be established, as it appears to be, that in the development of the parasite, the cortex of the root of the host is penetrated, and so an intimate connection between the two—indeed, a symbiosis—is set up. Then there is abundant evidence that the nodules are very rich in nitrogen. So far as the facts at command go, it would seem that, in certain stages of their development, their dry substance may contain a much higher percentage of nitrogen than that of any part of the growing plant itself; and in some cases, even higher than in that of the highly nitrogenous leguminous seed.

But whether or not it may eventually be established that nitrogen is fixed by microbes within the soil independently of leguminous growth, there is evidence that in soils and subsoils containing organic nitrogen, lower organisms may serve the higher plants, by taking up, or attacking and bringing into a more readily available condition, combined nitrogen not otherwise, or only very slowly, available for the higher plants. For example, it is probable that fungi generally derive nitrogen from organic nitrogen; and in the case of those of fairy rings, there can be little doubt that they take up from the soil organic nitrogen, which is not available to the meadow plants, and that, on their decay, their nitrogen becomes available to the associated herbage. Then in the case of the fungus-mantle observed by Frank on the roots of certain trees, it may be supposed that the fungus takes up organic nitrogen, and so becomes the medium of the supply of the soil nitrogen to the plant.

More pertinent still, is the action of the nitrifying organisms in rendering the organic nitrogen of the soil and subsoil available to the higher plants. It may well be supposed, therefore, that there may be other cases, in which lower organisms may serve the higher, by bringing into a more available condition the combined nitrogen already existing, but in a comparatively inert state, in soils and subsoils.

As to the undoubted fixation of free nitrogen in the growth of leguminous crops under the influence of suitable microbe infection, and of the development of nodules on the roots of the plants, the alternate explanations seem to be:—

1. That the plant is enabled, under the conditions of the symbiosis, to fix the free nitrogen of the atmosphere by its leaves.

2. That the organisms become distributed within the soil, and there fix free nitrogen, the resulting nitrogenous compounds becoming available as a source of nitrogen to the roots of the higher plants.

3. That free nitrogen is fixed in the course of the development of the organisms within the nodules, and that the resulting nitrogenous compounds are absorbed and utilised by the host-plant.

Dr. Gilbert seems to think that the balance of the evidence at present at command is much in favour of the third mode of explantation.

Practical Importance of the Question.

In regard to the practical importance of the newly-established source of nitrogen to the Leguminosæ, considered in its bearing on the known facts of agricultural production, and especially on the question of the sources of the nitrogen, not only of Leguminous crops themselves, but of crops generally, it may be stated that both agricultural investigation, and direct vegetation experiment, have clearly shown that Leguminosæ do take up much soil-nitrogen, and, at any rate, in great part, as nitrate. But the evidence does not justify the conclusion that the whole of the nitrogen has been so derived; and while the blanace of experimental evidence is against the supposition that the higher plants growing under sterilised conditions can assimilate free nitrogen; it is established that, at any rate, in the case of some leguminous plants, they may acquire nitrogen coincidently with the development on their roots of tubercular bodies with bacteroid contents; and the evidence points to the conclusion that it is the lower organisms, and not the higher plants, that fix free nitrogen. And further, that when such plants are growing in soil and subsoil containing an abundance of combined nitrogen, lower organisms may serve the higher, at any rate, in part, by bringing the already combined nitrogen of the soil and subsoil into a more readily available condition.

Summary and Conclusion.

There is no evidence that the leguminous plant itself assimilates free nitrogen. The evidence at present at command is in favour of the supposition that the observed gain is due to the fixation of nitrogen in the development of the lower organisms in the root nodules, and that the nitrogenous compounds produced are taken up and utilised by the leguminous plant. Further, the development of the supposed nitrogen-fixing bodies is obviously dependent on due infection with organisms essential to the setting up of the symbiotic life in the particular leguminous plant to be grown.

It seems probable that, in the growth in practical agriculture of leguminous crops, such as Clover, Vetches, Peas, Beans, Lucerne, &c., at any rate some, and in certian cases a considerable proportion of the large amount of nitrogen which they contain, and of the large amount which they frequently leave as nitrogenous residue in the soil for future crops, may be due to free nitrogen so brought into combination by the agency of lower organisms.

It has yet to be determined under what conditions a greater or less proportion of the total nitrogen of the crop will be derived—on the one hand from nitrogen compounds within the soil, and on the other from such fixation.

Incidentally the question suggests itself—how far the failure of red Clover, or of other leguminous crops, may be due to the exhaustion of the organisms necessary for nodule development, and for the consequent fixation of free nitrogen, and how far to the exhaustion of combined nitrogen in an available condition, or of the necessary mineral constituents, within the range of the plant-roots.

Assuming it to be established that a considerable proportion of the nitrogen of our leguminous crops is due to fixation under the conditions supposed, it is obvious that such a fact will not only serve to explain the source of the hitherto unaccounted-for amount the nitrogen of those crops themseves, but it will

also aid the explanation of the increased amount of nitrogen which other crops acquire, when they are grown in association, or in alternation, with Leguminosæ. Lastly, it will help to explain the source of part of the accumulated combined nitrogen within our soils, and the comparative slow exhaustion of their stores of it, by cropping, drainage, and in other ways. —*Gardeners' Chronicle.*

LIBERIAN COFFEE REDIVIVUS.

The abandonment of so large a portion of the coffee cultivation of Ceylon, India and Java has left Brazil and other states in South America to stand almost alone in supplying the consuming markets of the world. At the present moment stocks in Europe are unprecedently low, and the visible supply for the future is altogether inadequate for ordinary consumption. Under such circumstances it is not to be wondered at that the value of coffee is very much enhanced, and that certain qualities which a few years ago were considered of little value have taken the place of the better kinds, whilst these latter have risen in price above all precedent, Liberian coffee, which used to fetch some R25 per cwt. less than coffee Arabica, has now touched 100s, and attention is naturally drawn to its cultivation. Liberian coffee was first introduced into Ceylon and grown more as a curiosity than anything else; but, as leaf-disease began to affect the estates worse and worse every year, great hopes were entertained that the new and sturdy variety was destined to revive the fortunes of the planters. From one cause or another Liberian coffee did not turn out a success at first—in fact, too much was expected of it. It was planted in unsuitable soils and unpropitious climates; it was slow of growth; the crop would not ripen; when it did ripen it wouldn't pulp; and when it was eventually cleaned and sent to market it fetched a very low price compared with the ordinary produce of the estates. Finally it was found that the Liberian trees were quite as badly affected by leaf-disease and green bug as the other variety—indeed, it has been thought by some that green bug was introduced into Ceylon with the Liberian plants. The great disaster which overwhelmed our planters finally put an end to most of the experiments in planting Liberian coffee; and the cultivation, though a little is still in existence, was practically abandoned. In the meantime, however, Ceylon planters had taken the plant with them to the Straits Settlements, and commencement was made in Johore, the cultivation being afterwards extended to Sungei Ujong, Selangor, and Perak. Just at the time when the demand for coffee has so largely increased, these estates are coming into bearing and showing large profits, and it has been asserted that certain properties belonging to Messrs. Hill and Rathbone are bearing at the rate of 8 cwts. to 11 cwts. per acre. These figures, appearing some six or seven months ago in the Straits papers, were promptly challenged by one or more old resident planters, but the proprietors succeeded in proving that they were correct. It was however explained that these crops were obtained by the help of manure, and though, as regards statistics, there was no necessity to go further into the matter. Messrs. Hill and Rathbone went out of their way to show how fully they were justified in manuring such young coffee in order to take the greatest possible advantage of the high prices at present ruling in the home markets. We quote particulars of crops and acreage of four of the properties. Of the two states in Sungei Ujong we personally know nothing; but we have been told that they are really magnificent little properties, and, as the two total only 110 acres, it can easily be understood they can be kept in first-rate order and made to bear almost anything. Welds Hill estate and Batu Cave estate we have seen for ourselves. Welds Hill is within a couple of miles of the town of Kuala Lumpur, and is a very fine little property. Like the others it has been manured; but, having been planted too close, the trees have hardly got fair play. The outturn of 8 cwt. an acre is certainly very good, but, from the appearance of the estate, it should be capable of better things unless of course the trees are too crowded. The Batu Cave estate is a mere garden at the foot of immense rugged limestone rocks. The soil is magnificent highly charged with lime, and can be made to bear anything, being only 11 acres in extent. In less favourable localities in Ceylon, and under adverse circumstances of labor and climate, we have seen 24 cwt. an acre taken off a field of 16 acres. There are several planters who have elected to take comparatively inferior land in the neighborhood of Kuala Lumpur, and are planting it up avowedly with the intention of manuring and taking advantage, not only of the high prices, but of the facilities afforded them by the railway from Kuala Lumpur to the coast. Had they chosen they could have gone further inland and taken up better soil. These crops then which seem, and in reality are, so large, have been to a great extent produced by the help of manure, whilst the trees are very young, and consequently must not be taken as the standard from which to calculate what Liberian coffee will do in the ordinary soil of the country and with ordinary cultivation. The greater number of estates now in Johore would shew very poor returns; in fact, some of them have been extremely disappointing. The soil undoubtedly is very poor; and, wherever plantations are made on better soil, the result which might confidently be looked forward to would be better than those of the old Johore estates, whilst a similar liberal outlay would no doubt produce similar results to those from the estates in Selangor and Sungei Ujong.—Local "Times"

PRUNES IN CALIFORNIA.—There is money in prunes perhaps more than in any other fruit, except oranges Last season a ten-acre plot in Pomona (Cal.) brought a gross return of £1,583 or nearly £160 per acre. The market for dried prunes is the surest of all. The demand is not likely to be reached for the next 20 years.—*Mildura Cultivator.*

THE CEYLON TEA FUND COMMITTEE is still busy over many things: Agencies and exhibition not being the least of its objects of attention. We cannot see how the business in hand can permit of any reduction of subscription at least this year; but we suppose the Fund is not to be continued for ever or beyond a certain date; for, the day is surely coming when the virtues of Ceylon tea will be fully understood from the Arctic to the Antartic pole and from China to Peru; and then the Kandy Committee will sing "We have got no work to do."

A RICH DISCOVERY of opals of a finer quality than those of Mexico is just reported from Moscow in the State of Washington, U.S., close to the Idaho Railway. They were found by some labourers while digging a well in a wheat field, the mother rock being a basalt wacke. Opal is an amorphous hydrated silica, and is deposited from water. The finest specimens of the gem or precious opal come from Hungary, but those of Mexico are very fine. The fire opal of Zimapau, in Mexico, is transparent and of a deep red, being coloured by oxide of iron. Small veins of opal have been found in several parts of the United States.—*E. Mail*, March 26.

VINES.—Among the curiosities of tho California grape region is a vineyard that may well be called the smallest in the world as regards the number of vines, for it has but one vine. This is a most remarkable one, however, for its branches extend over a space of 12,000 feet, the cane being a foot in diameter. This extraordinary vine is over seventy years old, and was grown from an old Mission cutting by a Mexican woman. It has borne grapes every year since it was two years old, and is good now, they say, for six tons of grapes a year. Clusters weighing seven pounds have been picked from this ancient relic of the Mission days.—*Mildura Cultivator.*

MINES AND MINING IN CEYLON.

We think our exposure the other day of the attempt to depreciate the value of our Gemming Industry was justifiable and satisfactory. We are as anxious to get at the truth as any "roving correspondent" of our Indian contemporaries, and we are equally desirous to avoid exaggeration. But we cannot possibly understand how the total gross returns from an industry, enterprise or speculation which calls forth the energies of 20,000 able-bodied Sinhalese, can be put down at no more than £10,000 per annum. Even if it be said that the 20,000 natives do not work all the year round, but only at certain seasons, and that many of them, failing success in gemming, fall back on their relatives and village resources for means of support, it is absurd to say that so great a number not simply in Sabaragamuwa but in the Southern Province would continue to labour in gem pits—work extremely trying under any circumstances—or even in surface work, for an average return of not more than five rupees per head per annum. On the whole, we consider our estimate of fifty rupees a very moderate one.

But our object today is not to extend discussion which has already so fully occupied our columns in reference to Gems and Gemming; but rather to call attention to the other great branch of our local mining enterprise, namely the digging and export of Plumbago. Of the gross returns from this industry there is not room for the slightest doubt or inaccuracy. Every hundred-weight, we may almost say every pound is exported. The rise and progress of this great native industry in our midst has been very remarkable. Going back forty years, we find an export of no more than 23,823 cwt. in 1850, and we give the decennial exports to show the rate of progress:—

Export of Plumbago.

1850	...	cwt.	23,823
1860	...	„	75,660
1870	...	„	85,249
1880	...	„	208,738
1890	...	„	385,754

It was no wonder therefore that "plumbago" mining after the primitive native fashion should attract the attention of Mr. Barrington Brown when in our midst. Whatever difficulty he experienced in collecting correct information for his principals in respect of "gems," he could have no difficulty about plumbago. We have been accustomed to call it our only mineral of "commercial importance." Apart from gems, this will no longer be correct, for the export of "mica" is beginning to make some show. But the great demand for Ceylon plumbago for crucible purposes, has made the industry one of first class importance. Mr. Barrington-Brown did not fail to see this, or to note the practical monopoly which this Colony has of the supply. And yet he found that in connection with the industry, no modern mining appliances, the results of English skill and invention, had been applied. A few natives, it is true, use pumps; but only after a primitive fashion. On this part of his mission, the expert was able to report with confidence. He visited a large number of plumbago mines, and carefully inspected those which had been got on lease, or purchased for his Syndicate, and in nearly every case he was able to show how inadequate was the native mode of working—how when mines got to a certain depth, the aid of capital and skill became indispensable in order to free the pits from water, and how consequently the works are not prosecuted as they might be by European Companies in command of capital. In one case, Mr. Barrington Brown illustrated the primitive way in which things were being done. There was a boiler fed from a tank supplied with water by two men who hoisted it from a stream, and a Sinhalese watchmaker had arrived to repair the pumps. In this he failed and the water in the pits rose to within 12 feet of the surface. All the time there was a large stream flowing close by which could have driven a waterwheel giving power to the pumps! Scientifically worked, the "expert" felt sure that the plumbago properties secured by his Syndicate would prove very profitable. On this opinion, the London promoters have acted, sending out an English mining engineer and a supply of pumps to erect on some of their properties in the Kalutara district. The result of his operations will, no doubt, be seen erelong; but meantime, we cannot help once more expressing regret that the Syndicate did not see their way to send back Mr. Barrington Brown with power and means to direct operations in respect of both gem and plumbago mines in correspondence with his very practical and valuable Report. Until this is done, we can scarcely feel that justice has been done to local mining industries and a fair test applied to their value and prospects of development.

LETTERS FROM JAMAICA.

JAMAICA EXHIBITION—OPENING CEREMONY—THE BUILDING AND EXHIBITS—THE RECEPTION OF PRINCE GEORGE OF WALES—THE FESTIVITIES—LEGISLATIVE SESSION—POOR CROPS ON THE BLUE MOUNTAINS.

Per Packet of 10th March.

It is again a long time since I addressed you, and I must apologize for not having ere this sent you an account of the opening of the Jamaica Exhibition; but as you exchange with our local *Gleaner* newspaper, you will no doubt, ere you get this, have received a copy with particulars of the opening ceremony which proved a great success, so that our energetic and hard-working Governor Sir Henry Blake was well rewarded for the trouble he has taken in bringing about this success. Praise must also be awarded to all concerned in the planning and erection of the building which is a very picturesque edifice, and causes regret that being of wood it cannot be permanent; and though it would be a grand thing for the town of Kingston to take it over, and keep it up as a sort of "Crystal Palace," I learn the owner of the land declines to sell, so it is feared that unless matters can be arranged the building must come down and be sold as second-hand lumber, which will be rather a melancholy termination of the affair.

The Exhibition was opened on the 27th January by Prince George of Wales as representative of the Queen, his grandmother, and his father the Prince of Wales, and very well he acquitted himself, won great popularity, and was most warmly greeted and received by the people who turned out in thousands to see him, the occasion having been made a public holiday. On the daïs was a large gathering of our Jamaica notables; and also the Earl of Rosse, and other distinguished visitors from King's House, friends of our Governor who had been invited to Jamaica for the Exhibition. The Bishop of Jamaica read a very appropriate dedication prayer, and the choir sang "God save the Queen," "God bless the Prince of Wales" and a hymn suitable to the occasion: after the presentation of the address the Governor asked Prince George to declare the exhibition open, and he moreover made a very nice speech. The aisles of

the building were lined by the police, and Kingston volunteers, and some 7,000 people passed the turnstiles on the opening day, the entrance fee, except for season ticket holders, being 7s 6d up to 4 o'clock.

The building is in Moorish style, the idea, I believe, being taken from the Glasgow exhibition. There is a central dome, and small minarets at the corners: there are aisles and galleries, and the effect within is very pleasing, and the various courts were very fairly complete on the opening day. In the grounds there is an *annexe* chiefly filled with Canadian exhibits. That large country is the principal exhibitor; most of the West India Islands are also represented, but there are not many American exhibits, as "Uncle Sam" took umbrage because he was not officially asked to partake in the Exhibition, not being satisfied with the customary notification sent alike to all countries and nations that an Exhibition was to be held in Jamaica in January. Of course there are several English exhibits, and also many foreign ones, so there can be little doubt that the Jamaica Exhibition will make Jamaica more extensively known than it has hitberto been, and it is hoped it may be the means of extending and reviving our commerce, for Jamaica is neither *quite* defunct or asleep as is generally supposed to be the case. Neither is it the hotbed of yellow fever so that it need no longer be supposed that a person going out to Jamaica, is sure to find a grave there, any more than a Jamaican visiting England is bound to die of consumption or scarlet fever. It was unhealthy over-crowded Barracks, many close to malarial swamps, the drinking of new Rum, and general fast living that helped to decimate our troops in "old time" days; for now the military mortality in Jamaica can I believe be very favourably compared with other Colonies and stations of that Empire on which the sun never sets.

There is an Art Pavilion in which many very pretty and artistic pictures are exhibited. There is also a Model Dairy for showing people how butter is made, but though Jamaica abounds in horned stock, it has not been possible to get sufficient milk to work the Dairy properly, cows on the many "Pens" being kept not for their milk but for the rearing of stock, so that very few are milked, and they consequently get very wild and have to have their legs tied or to be thrown down before any milk can be got from them. There is a potter from Doulton's; a shed for machinery in motion; there are models of settlers' huts, and some Caribs have been sent over from St. Vincent who work at their basket-making, etc. There is also a theatre in which an English Dramatic and Variety Company performs a panorama showing Canadian views by lime-light, one or two shows, a maze, a shooting gallery, and a large steam "merry go round" which is very largely patronized by the young darkies of both sexes. The band of the 1st West and of the Kingston Volunteers discourses sweet music at intervals, and there is a very good display of fireworks on Wednesdays and Saturdays. Messrs Lascelles, de Mercado & Co. have a pavilion of their own for their special exhibits, and Aston Gardner & Co. have an excellent refreshment room, and besides there is a restaurant within the building "run and bossed" by a Yankee. The building is lighted by electricity, but was at first somewhat a failure. Tramcars bring the people close up to the building, and the entrance is only 1s. and I should think later on will be reduced to 6d as an inducement to more of the people from the country to come to town and be educated by a slight they are never likely to see again during their lives.

Kingston was in gala dress for the reception of Prince George; triumphal arches were erected along the route taken to King's House, and an address was presented at the Town Hall; several vessels of war of the West India Squadron were in harbour including the Admiral's ship the "Bellerophon," and the Prince's despatch vessel the "Thrush." There were also one large Russian man-of-war, and two Spanish gunboats, so that the consumption of powder in various salutes was rather extensive. One thing to be missed was that none of the Governors of the other Islands accepted Sir Henry Blake's invitation to be present: it would have added to the importance of the opening ceremony, nevertheless, it was a great success far greater, I fancy, than was generally anticipated.

The Governor gave two balls one in honor of Prince George and the opening of the Exhibition, when the new ball-room was used for the first time; the second the week after was a fancy dress ball which also was a most brilliant success. The Governor was dressed very handsomely and appropriately as Christopher Columbus and Lady Blake as Isabella of Spain: the costumes were copied from old pictures at Madrid. Besides these, there were very many handsome and pretty costumes; and the variety was great and the whole scene very bright and picturesque. Your humble servant appeared as "Santa Claus" alias "old Father Christmas," and was complimented on his appropriate costume, and Dr. Plaxton was simply perfect as an African slave driver and dealer; he was the most observed of all, for it was a real costume purchased on the Coast by an officer of the West Indian Regiment and lent for the occasion. Besides the balls, there were races at Cumberland Pen, cricket and polo, in the latter of which Prince George took part; and it will be many a long day before the Kingstonians' see the like again.

Our Legislative Council is now in session, and have to pass many important laws. The Governor's opening speech disclose a most satisfactory state of affairs, and there will be money in hand to carry out the building of bridges and improvement of roads.

As regards crop it is very backward this year in the Blue Mountains, and with the exception of one or two properties is not expected to be a large yield. We have had rather a wet February, which is unusual, it being, as in Ceylon, generally the driest month in the year. W. S.

CEYLON'S EXAMPLE TO BE FOLLOWED IN SOUTHERN INDIA.

The following is from the *Indian Agriculturist*:—"There appears to be some prospect of a general increase of tea cultivation in the Wynaad. The fact that this district has been left so far behind in the race with Northern India and Ceylon is attributed by a local apologist to the difficulty of establishing factories for the treatment of the leaf. It is proposed now to start a number of factories as joint stock companies and work them on the Ceylon system, by which a fixed charge of say two annas per pound is allowed for wear and tear of machinery and profit to the manufacturer, while a further charge is made for absolute cost of manufacture, packing, transport, etc., including insurance and all home charges. The average price of tea per pound ruling in the London market is calculated at the current rate of exchange, and the planter obtains this sum, less the fixed charges of the factory. By the adoption of this system it is thought that the cultivation of tea may become profitable on many small estates where the treatment of the leaf by hand is now out of the question as a commercial undertaking."

A COMPLIMENT TO A COLOMBO FIRM.

In an article dealing with this same subject the *Madras Times* says:—"The large fields of tea now planted in the Ouchterlony Valley, with the splendid factory lately erected there by Messrs. Walker & Co. of Ceylon, and the cheap cost of manufacture which this working on a large scale demonstrates, has created a general stir, aided by the very successful planting of Mr. Punnett at Pundalur, whose forty acres of tea by the side of the main road attract the attention of all passers. But the initial difficulty still remains how to dispose of the leaf where no factory has been established to buy at a fair price."

A WELCOME BACK

has to be given to Mr. Thos. Dickson, junior, who left us about a year ago and in the interval has voyaged or travelled (chiefly in America) some 27,000 miles. Mr. Dickson's contributions to our *Literary Register* have been read with much interest and we are glad to say there are more to follow. Mr. Dickson has wandered over the American continent from New York to San Francisco and from New Orleans to Toronto. In the last-mentioned Canadian town, he found large quantities of Ceylon tea in godowns, the brand of "Wangie-oya" being prominent. In New Orleans again he found Ceylon tea drunk regularly at the oldest club in the town and he had the felicity of being introduced as the maker of the tea, it being from Lebanon estate. The New Orleanists received the Ceylon planter with princely hospitality. Mr. Dickson was also, as a shareholder, entertained in New York by the Directors of the Ceylon Tea Planters' Company and he formed the highest opinion of Messrs. Watson & Farr (a firm of such high repute that it is an honour to Ceylon to have their names as promoters of her tea) and also of Mr. Elwood May. The place Mr. Dickson was most tempted to stay in was the vine and fruit growing district of California where with irrigation they seem able to grow anything and have besides a delightful climate. Mr. Dickson returns to the charge of the Lebanon group of tea plantations.

THE AMSTERDAM MARKET.

Amsterdam, March 18.

CINCHONA BARK.—The sales which will take place in Amsterdam on April 2nd, 1891, consists of 6,405 bales, 996 cases (about 599 tons), divided as follows:—Java bark: From Government plantations 429 bales, 29 cases, about 41 tons; from private plantations, 5 976 bales, 965 cases, about 558 tons. Sumatra bark: 2 cases, about 5 cwt. Druggists' Bark: Succirubra quills, 704 cases plus 2 cases Sumatra; broken quills and chips, 644 bales 18 cases; root, 170 bales, 35 cases. Calisaya quills 40 cases; root 8 bales; C. Schuhkrafft quills 27 cases. Lancifolia quills 72 cases; broken quills and chips 31 bales, 15 cases; root 21 bales. Manufacturing Bark: Ledgeriana quills 69 cases; broken quills and chips 3,655 bales, 1 case; root 1,161 bales. Hybrids quills 10 cases; broken quills and chips 536 bales, 3 cases; root 136 bales. Officinalis broken quills and chips 43 bales. Total, 6,405 bales, 994 cases Java bark; 2 cases Sumatra (druggists' bark.) —*Chemist and Druggist.*

PRECIOUS STONES AND PHOSPHORESCENCE.

Substances which are phosphorescent under ordinary conditions glow with the greatest brilliancy when submitted to the negative discharge in highly attenuated gases. Canton's phosphorus shines with all the splendour induced by strong sunshine. Under the same circumstances the diamond, especially, that from the South African fields, phosphoresces with a brilliant light blue colour. Diamonds from other localities were found by Mr. Crookes to shine with all varieties of colour, such as bright blue, pale blue, apricot, red, yellowish green, orange and bright green. A green diamond when phosphorescing in a good vacuum gave out almost as much light as a candle, and the different faces of the naturally crystallised gems were found to glow with different shades of colour. The ruby, which is practically almost pure alumina, phosphoresces with a rich full red. A number of rough rubies in a high vacuum glow, when the molecular discharge plays upon them, as if they were red-hot, and with an illuminating effect almost equal to that of the diamond under the same conditions. The colour of the ruby has apparently little or nothing to do with the phenomenon; pure white alumina, rubies of a pale reddish-yellow, and gems of the "pigeon's blood" colour, all emit practically the same deep red glow. The artificial rubies of Messrs. Fremy & Feill, which are of the same chemical nature as the natural stone, behave in precisely the same way when subjected to the discharge in a sufficiently high vacuum. showing that in this as in all other respects the natural and artificial rubies are identical in character. The sapphire, however, which in chemical composition differs but slightly if at all, from the ruby gives out a bluish-grey light, whilst the emerald glows with a fine crimson-red colour.—*Good Words.*

RAINFALL REGISTRATION IN INDIA.—From a Government resolution we quote as follows:—

With regard to the necessity for the definition of a "rainy day," the Meteorological Reporter remark that from an agricultural point of view, it is not only necessary to know the total amount of rain, but also the character of the rainfall. It is evident that a rainfall of 20 inches during a given period in two or three cyclonic downpours might be destructive to the crops, whilst the same amount occurring as frequent moderate showers in the same period might be beneficial in the highest degree. The only fairly satisfactory way of discriminating the character of the fall is by comparing the actual number of rainy days with the normal number, and the starting point for such a comparison will be a suitable definition of a rainy day. The Meteorological Departments of other countries have generally adopted a rainfall of ·01″ or upwards in twenty-four hours as defining a rainy day, and this has been followed in the annual reports on the Meteorology of India. A fall of ·01″ however appears to be too small to be of any value for agricultural purposes in this country. The knowledge of such a fall might be a useful indication of the prevalence of cloudy weather which is some times very desirable for the crops at certain periods. But the comparison usually desired appears to be between the actual number of days on which useful or heavy rain fell and the normal number of such rainy days; and the Government of India concurs with the Meteorological Reporter that a fall of ·1″ (one-tenth of an inch) in twenty-four hours will be the most convenient and suitable definition.

The proposals for the improvement of rainfall registration which have the approval of the Government of India may now be summarized. 1st.—That a common hour for registration, viz., 8 a. m., and a common rainfall week ending on Saturday 8 a. m. should be adopted in the whole of India. 2nd.—That all rain gauges should be *systematically* inspected. the services of the Meteorological Reporter to the Government of India being utilized for supervision of the duty of inspection wherever this is considered desirable. 3rd.—That Symon's rain gauges, tested by the Meteorological Department, should be the only description of gauge used. 4th.—That monthly returns of rainfall be published by each local Government, of which copies would be found together and issued as an annual volume by the Imperial Meteorological Department. 5th.—That the Imperial Meteorological Department should adopt a fixed division of the year into four periods corresponding with the periods of general rainfall for purposes of comparison. 6th.—That for the purpose of calculating the number of rainy days a fall of one-tenth of an inch and upwards be taken to denote a rainy day.

QUININE.

To Dr. King of the Calcutta Botanical Gardens, in his capacity of Chief Superintendent of the Bengal Cinchona Plantations, I am indebted for a specimen of

THE SULPHATE OF QUININE

manufactured at Mungpoo by my good and able friend, Mr. James Gammie. So long ago as March 1876, I saw Mr. Gammie's process of preparing mixed alkoloids. He has gone on adopting improved methods, until now the Mungpoo Quinine is as valuable in medicine, if not quite so white and flaky as Howard's celebrated preparation. With the present low market prices, the difficulty must be to make the manufacture pay. Prices cannot well go lower, and yet the increase in the consumption of this valuable febrifuge, tonic and remedy against the effects of opium eating and dram drinking, is by no means such as might have been reasonably expected. If only Russia treated her soldiers as human beings, whose lives are sacred, ought to be treated, the consumption of the drug would be doubled at once.

Tea continues to flush luxuriantly. Exqusitely clear views great rock face of Kirigalpota, varying aspects of Adam's Peak and flanking ranges including Laxapanagala cliffs.

Mr. Hamlin states the great success of 104 acres Coorg coffee on Kondesala under the shade of *Ficus glomerata*, planted 1888-89; crop this year will pay all expenditure. Coffee with cacao amongs it shows no trace of *hemileia.* Experiments will now be tried on Naranghena 2,000 feet; Delmar over at 4,000.

On other hand old diseased coffee with all atten-ton yields only R25 profit against tea 95 per acre. As Sir Wm. Gregory said 'Can't make an old man young.'

DR. TRIMEN ON JAVA.

(NEW TREES &c., FOR CEYLON.)

From a very interesting letter from Dr. Trimen in answer to questions of ours regarding trees suitable for Ceylon, we venture to quote some passages:—

"All I saw of the hill-country of Java was thus—the sanatorium of Sindanglaia at about 3,500 ft., and the Hill Garden at Tijbodas about a thousand feet higher on the slope of the Gedeh volcano which is always puffing a little. This garden is very poor after Hakgala, but they have a few fine things, notably two magnificent specimens of *Xanthorrhoea hastilis*, and several good conifers of which I bespoke seed. They grow *acacia decurrens* here (the form without suckers) but generally the Australian trees did not look so well as here in Celyon. I do not fancy there is much in the way of native hill trees in Java worth our attention here, the *general* character of them as far as I saw being like our own: slow growing, comparatively small and no doubt very difficult to grow. As with us they prefer foreigners. I saw a good deal of *cedrela serrata* ('Red Toon') planted by roadsides and doing well. The Malayan Oaks are very numerous, but by no means particularly hill trees. There are several species at Singapore, prominent trees of the jungles at sea level. I have brought back with me seeds of one called after poor Cantley *Quercus Cantleyana* by King, a very handsome species. There are no less than 104 oaks in the Indo-Malayan region already known: it is curious that we have not one in Ceylon.*

"*Dammara alba* (Agathis loranthifolia) is the ordinary species of Dammara tree in Malaya, a beautiful pyramidal tree of which I have some fine young plants here received some years back from Sir H. Lowe from Perak, but the Queensland *D. robusta* is a good deal grown in Java as here. I have not seen *D. australis* which needs a cooler climate I think.*

"Cubebs is a puzzling business. I saw their plantation at Buitenzorg and have specimens from it. Possibly more than one species is grown there. I believe I have already here one of them, but they have not yet fruited and till they do so, it is but guess work. One difficulty is the great difference in the leaves of the young plants and the adult fruit bearing ones. I hope soon to have abundant material for coming to a conclusion; at present not even at head-quarters could I get much definite information.

"Buitenzorg is an astonishing place, and Dr. Treub a man much to be envied. The Dutch Government deserves great credit for maintaining at such a high level and in such a liberal manner an establishment worked on an almost purely scientific basis. There are no less than four fully equipped laboratories in thorough working order, each under a scientific head—Botanical, Bacteriological, Pharmaceutical and Agricultural, all fully equipped with all the latest improvements.

"The Economic or Experimental Gardens (Cultuurtuin) is quite separate from the Botanic Garden (about 2 miles off) and also has a scientific head under Dr. Treub. It is about 200 acres in extent and laid out in large square plots each devoted to one product, everything well kept and in beautiful order with plenty of labour and appliances. Very large distributions of plants and seeds are made from here to planters and others and *nothing* is ever charged for them; all is given free.

"The Botanic Garden itself is a wonderful and unique place, but without much beauty save in one or two spots. It is very wonderful to see such an enormous number of trees all growing in a classified arrangement. It could of course only be done in a soil and with a climate which will grow anything. But even here many are distorted and stunted and convey very little idea of what the tree is really like. More room is urgently needed, and is to be afforded at once by the annexation of adjacent land.

"I prefer Peradeniya as a garden, combining the *utile* with the *dulce* as it does, but what I envy Dr. Treub is his large staff of capable trained European assistants, and abundant and liberal funds! also his freedom from nursery-garden work and the absence of any charges for supplying things."

All this is very interesting to us as we had Dr. Treub's guidance over the various gardens in 1881. He also shewed us the fine Museum and Library attached to the gardens. All this liberal support of botanical, horticultural and agricultural science is very creditable to the Dutch Government.

NOTES FROM THE SOUTHERN COLONIES.

(*By an ex-Ceylon Colonist.*)

My visits to Adelaide, Melbourne and Sydney were very pleasant, but I doubt that I should like to live in any one of them. Unless it be a lucky venture in mining scrip, there is nothing there or here which will give the same return on capital as a good tea estate in Ceylon. The labour question is a big trouble in all the Colonies and has some curious developments which, unless capital is to become the servant of labour, will have to be resisted to the death. The present strike amongst the shearers in Queensland very clearly illustrates one of these

* The reason given by Wallace for the presence of the mountain oaks in Java was its former connection with the Himalayas, but all this abundance of sea level oaks takes us entirely by surprise.—ED. *T. A.*

* *Dammara australis* is the New Zealand pine or kari (not kauri, which is the native name of *Eucalyptus diversicolor*) and it might do well in our higher mountain regions.—ED. *T. A.*

phases. The men have not struck because their wages are too low or hours of work too long or because of dissatisfaction with their masters' ways or manners, but because their Union has decided that squatters must not engage their shearers direct, but through the Union offices to whom application for hands must be made and who will supply it in quantity and quality at their discretion. Because masters object to place themselves in bondage to such an agreement, the Union shearers have gone out on strike, have assembled in a large armed camp from which detatchments go out to drive away, if possible, free labourers, burn down goods sheds, fire runs, tear up railways which might bring up free labourers, and cut the telegraph lines, and they have been doing this sort of thing for about six weeks in a Colony which has an organisation called a representative Government !! Be thankful that you live in a Crown Colony, the advantages of which form of Government I never realised so clearly as now, and that you have the Tamil cooly for a labourer.

The labour creed has been reduced to rhyme by a labour poet in the following words:—

"Eight hours work,
Eight hours play,
Eight hours sleep,
And eight bob a day,"

This is for our ordinary "pick and shovel man." Since my arrival in Auckland the shoemakers have gone out on strike for a scale of wages which masters say will make seventeen shillings per day. I am thankful that I brought out a good supply of boots and shoes, for it is likely they will be rather dear in this colony in future. The climate of this place is very nice, something like the shade temperature of Nuwara Eliya and not so hot a sun.

THE KELANI VALLEY TEA ASSOCIATION, LIMITED.

Report of the Board of Directors, which was presented to the Shareholders at the Fifth Ordinary General Meeting on the 16th April:—

The Directors have the pleasure to submit to the Shareholders the Accounts and Balance Sheet for th eighteen months, ending 31st December 1890.

These Accounts, the Directors consider show a very fair result for the first profit-yielding period of the Company's existence. Looking at the final result, it must be borne in mind that the profits for the past season have to liquidate the proportionately heavy balance brought forward from the previous acounts; apart from this balance, the account would show a profit equivalent to nearly 10 per cent per annum.

In the Report issued to the Shareholders on 1st October 1890, it was stated that the Company had acquired the small property "Dover" on favourable terms. The Board have much reason to be satisfied with this purchase which will prove a material factor in the future profits of the Company.

Estimates of Tea for the past eighteen months were:—

	lb.	
From Degalessa	103,020	
„ Dover	8,000	
		111,020 lb.
Actual production Degalessa	120,727	
„ „ Dover ...	12,606	
		133,333 lb.
Which shows an excess over estimate of		22,313 lb

Since the date of last Report the Company have purchased a small additional piece of land, in all 7½ acres, at a cost of £27, to admit of a cart road being made at an easy gradient to connect the Factory with the main road across the Ferry.

With a view to the further extension of cultivation of the Company's property, it is proposed by the Board to issue the remaining 397 unallotted shares, and the following Resolution will be submitted to the Meeting, in order to give effect to this:—"That in pursuance of Clause 9 of the Articles of Association of the Company, the Directors be, and they are hereby, authorized to issue the unallotted Shares of the Capital of the Company, being 397 Shares, at a premium of £1 per Share, and that such Shares be offered at such premium first to the existing Shareholders *pro rata* and in proportion to their present holdings, and that any Shares which shall not be taken by the Shareholders shall be disposed of by the Directors for the best interests of the Company; the premium of £1 to be payable forthwith upon allotment and with the first payment to be made upon the Shares."

	£	s.	d.
The Net profits shown in the accompanying Accounts is	£646	0	3
Out of which the Directors recommend that a Dividend be paid at the rate of 5 per cent. free from Income Tax, which will absorb	464	0	0
Leaving a sum to be carried forward to New Account of	£182	0	3

As a result of the action of the Directors, referred to in their previous Report, the violent fluctuations in Exchange during the past 18 months have not appreciably affected the Company.

BALANCE SHEET, 1ST JULY, 1889, TO 31ST DEC. 1890.

Liabilities.

	£	s.	d.	£	s.	d.
To Capital Account—						
Nominal Capital 2,000 Shares of £10 each..	20,000	0	0			
„ Capital Issued ..	16,030	0	0			
In 1,350 Shares of £10 each, on which £5 per Share has been called up	6,750	0	0			
253 fully paid Vendors' Shares	2,530	0	0			
	9,280	0	0			
Less Call in arrear (since paid)	10	0	0			
				9,270	0	0
„ Debentures issued to date—						
"A" Series ..	4,250	0	0			
"B" „	2,500	0	0			
				6,750	0	0
„ Bills Payable				3,879	3	4
„ Sundry Creditors				1,841	7	3
„ Exchange Account				463	15	11
„ New Oriental Bank, London, amount due on Current Account				2,004	18	4
„ Profit and Loss Account				646	0	3
				£24,855	5	1

Assets.

	£	s.	d.	£	s.	d
By Degallessa Estate—						
Balance from last Account	10,997	19	2			
Expenditure, developing New Clearings	1,791	11	4			
Cost of Land purchasol	140	16	0			
				12,930	6	6
„ Dover Estate—						
Purchase Price of Property ..				2,000	0	0
„ Building and Machinery Account—						
Balance from last Account	518	12	0			
Amount expended during year ..	3,826	14	0			
				4,345	6	0
„ Coast Advances				743	15	0
„ Produce Shipment—						
1890 Season's Tea realised after 31st December				1,835	8	0
„ New Oriental Bank, Colombo, amount lodged on Deposit Receipt ..				3,000	0	0
„ Petty Cash				0	9	7
				£24,855	5	1

MR. J. L. SHAND AND A NORTH BORNEO COFFEE COMPANY.

London, April 3rd.

When my last letter was written it was not possible to tell you what Mr. J. L. Shand had determined with respect to sharing in the expedition to the Andes which Sir Alfred Dent has been organizing. But we have learned during the present week that there now exists but little probability that he will take part in it. Mr. Shand would not have been disinclined to go, we think, had it been possible for him to obtain the pecuniary inducement which he considers to be necessary. This, we are told, is not forthcoming, and naturally, therefore, Mr. Shand can scarcely care to expose himself to the risks and hardships which must attend any expedition of the kind.

It is said—indeed it has now been publicly announced—that Mr. Dawkins, first Private Secretary to the Chancellor of the Exchequer, has resigned that appointment to accept charge of this expedition to the Andes. A great deal of surprise has been expressed that that gentleman should care to throw up a position which opens up so many possibilities for the future in order to take part in a venture, successful issue to which must be, to say the least, exceedingly problematical. Even if territory likely to be suitable for coffee growing be found on the slope of the Andes, the question will still remain as to whether it will offer sufficient inducement for the investment of the necessary capital. All the South American Republics have got into exceedingly bad odour lately, and it is very greatly to be doubted if British capitalists would care to risk more money in countries so constantly liable, as they are, to insurrectionary disturbance. We may well feel confident that there would be no difficulty in obtaining the services of any member of young Englishmen and Scotchmen to go out and pioneer the enterprise, however deterrent the conditions may appear to be. It is to the love of travel and adventure which would induce that readiness to go out which has probably actuated Mr. Dawkins to the step he has taken. You, we believe, are already aware that Mr. Clark, of the Peradeniya Botanical Garden, is now on his way home, as we hear to go out with the expedition, and doubtless his services will be of great value. We have not heard the names of any other gentlemen mentioned as intending to take part in it.

The circumstances under which Sir Alfred Dent has arranged for this venture are singular and exceptional. That gentleman is, we believe, the Chairman of the Committee of Foreign Bondholders, and in that capacity, the Peruvian Government being unable to meet its obligations on the bonds issued by it, he received the transfer or allocation by the Peruvian Ministers of certain tracts of land with valuable privileges attached, either as security for the ultimate payment of these bonds or in satisfaction of all the claims which may be made upon them. This must have taken place between 18 months or two years ago, because when Sir Alfred Dent was present at a meeting of the Ceylon Association in London some 15 months or so back, he asked Mr. Leake to recommend to him some gentlemen who might be qualified to go out and report on the suitability of the lands or various forms of cultivation such as are pursued in Ceylon. The contemplated expedition will be the outcome of these arrangements entered into by Sir Alfred Dent in the interests of the holders of Peruvian bonds.

While it seems to be almost certain, as has above been written, that Mr. J. L. Shand will decline to take any part in the venture described, he has turned his attention seriously to coffee cultivation in Borneo, and since my last letter was written he has registered a Company by the name of the Borneo Coffee Company (Limited), the prospectus of which I have seen. This states the proposed capital of the Company to be £20,000 in £10 shares, the object being to adopt an agreement between Mr. F. Walker and the Company to purchase plantations in British North Borneo and elsewhere, and to cultivate coffee, pepper, cacao, tobacco, &c. The articles of registration provide that the number of the directors is not to be less than three nor more than seven : the first board to be appointed by the subscribers and the qualification to be the holding of 10 shares, the remuneration having to be fixed at a general meeting. Mr. Shand's offices have been registered as the office of the new Company at 24, Rood Lane, E. C. The following list of the first subscribers will show you who the gentlemen are who have interested themselves with Mr. Shand in starting this new scheme:—Mr. H. Walker, 15, Great Russell Street Bedford Square ; Mr. W. H. Anderson, Rupert Lodge, Burnham, Bucks ; Mr. J. Fleming, 24, Rood Lane, E. C., Mr. A. Walker, 23, Rood Lane, E. C., tea broker ; Mr. J. S. B. Ridge, 23, Rood Lane, E. C., tea broker ; Mr. J.G.K. Grove, 123, Cannon Street, E. C. accountant ; and Mr. J. L. Shand, 24, Rood Lane, E. C. Mr. James Whittall is also one of the first directors, as is Mr. Shand.—London *Cor.*

THE INDIAN MANFACTURING INDUSTRIES.

[Iron is so cheaply produced in Britain and the freight to Ceylon is so moderate, that for the small quantity used locally, we do not suppose it would pay to establish the manufacture in Ceylon, even if coal were discovered in our island. All the other essentials,—limestone, clay and manganese we have, with the finest graphite in the world for crucibles. In copying the following article from the *Times of India*, the idea which occurs to us is, that if iron and steel manufactures, on a large scale succeed on India, the day may come when, we shall obtain our supplies, of those metals from the opposite continent in exchange for our pure plumbago.—ED. *T. A.*]

Next to iron and coal the minerals of most importance, to any one interested in the development of the Indian manufacturing industries, are those incidentally useful in the working of iron. Foremost among these stands limestone, which is essential if we wish to obtain iron from the ore on a commercial scale. Fortunately this mineral is found in great quantities at or near the probable iron mines of the future. They vary, however, very greatly in quality, many beds containing a heavy proportion of worthless ingredients. Carbonate of lime is the chemical required for foundry work, and that limestone is the best which contains the greatest quantity. The proportions vary immensely, as will be seen from an examination of samples from different beds. Some calcareous tufa in the Darjeeling range showed 98½ per cent of pure carbonate of lime and only 1½ per cent of foreign matters, of which all but an infinitesimal fraction consisted of magnesia. On the other hand, samples taken from the pachete rocks, near the Raneegunge coal fields, showed on analysis only 45 per cent of calcium carbonate, the balance being chiefly made up of 11½ per cent of magnesium carbonate and *over 39 per cent of insoluble matter.* It is this high percentage of insoluble matter which is the great objection to the use of the

Raneegunge limestone, otherwise the beds of Hansapather, which show 83½ per cent of calcium chloride, would do well enough if the insoluble matter, amounting to some 16 per cent, could be eliminated. In the Wardha valley, another great iron field, limestone is found containing from 94 to 97 per cent. of carbonate of lime and only 2 per cent. of insoluble matter, an advantage that would tell heavily in favour of any works for reducing iron ore established in that district. The best limestone is found in the Vindhyan range, and could be cheaply transported to any works that would probably be erected. There is no limestone actually available at Salem, though the iron fields there are the richest in India; but it occurs in many places in the Madras presidency some time with only 2 per cent of impurities. So valuable, however, are the Salem iron fields that it would pay to transport whatever limestone might be necessary for works erected there, especially as it can be obtained near the line of rail. Nature has been prolific in her stores of all required to develop the iron ores of India, but we seem unable to realize the wealth lying at our feet.

Next to limestone, fireclay is one of the most necessary products, for imported bricks and clay are very costly. The best fireclays are found in England, as in India, in the beds underlying the coal seam. Excellent bricks have been made from the Raneegunge clays, and have successfully passed very severe tests in the Calcutta Mint. The cost of firebricks made from them is, moreover, only Rs. 2·1 per hundred—about a quarter of those obtained from England. When the Bengal Iron Works Company was in existence it used bricks made of local clay with good results. Good fireclay is also found in the Madras Presidency and in the Vardha Valley. We have, however, grave doubts as as to the value of Indian firebricks, as hitherto made, for the inner layer of iron furnaces. They do extremely well for all parts of the furnace, if fortified with a lining of English bricks. This however, appears to be necessary where great or prolonged heats are obtained. It is quite possible however, that an increased demand might develop some better method of treating the local clays, so that they would make bricks suitable even for furnace linings. That they can be made in all other positions is an enormous saving, and the cost of importing English bricks for lining only would not be excessive, and should not stand in the way of a foundry. Graphite is another substance of great value in a foundry, as the cost of imported crucibles is very great. The drawback of local graphite is the high percentage of impurities. Good specimens have been found in Travancore, which have been worked up into crucibles suitable for all but excessive heats. It is more than probable that if a proper system of manufacturing crucibles under pressure was started in Madras, the results would prove of great value if annealed—a precaution which should be taken in this country even with imported crucibles—and it would perhaps be worth trying. Considering the high position held by Ceylon graphite in the commercial world, it would probably be better to import this material as the cost of transport would not be great, and Ceylon graphite could be made into crucibles as well in India as in England, if proper machinery was set up. It is a valuable industry and well worthy of encouragement, though utterly overlooked up to now. A demand would create a supply, and a steady and scientific attempt to develop local ores would soon create this demand. Everything depends on a start being made in the direction of developing local iron ores; that once done, all the rest will follow. it is useless to try and make graphite crucibles in India, without hydraulic pressure and the proper machinery, since crucibles thus made crumble too much in the fire, to be able to stand great heats, though useful enough for small brass castings of a few pounds only. It is so important to obtain good local crucibles for economy in working, even if they be made from Ceylon graphite that we wonder the matter has never been taken up before. Possibly the comparatively small demand has prevented any attempt in this direction, but if large local works were established their demand would be considerable, and should be met accordingly.* Manganese is also procurable in India, though no large quantities are known to exist in any one place:—"The commonest ores are manganite or gray oxide; wad or earthy protoxide, pyroluxite or the black perobide; psilomelane, a combination of the oxide of baryta hausmanite or peroxide occurring with other ores of the metal; and braunite or binoxide in combination with iron peroxide; silica and manganesia." The latter is found at Vizagapatam and Bimlipatam, the beds in the former district yielding sufficient for working iron on a considerable scale even as already discovered, while careful search may reveal large beds. Psilomelane and pyroluxite are found in the Central Provinces where it has long been used in glass making, but has not been worked to any great extent. These specimens contain more oxygen than those in the Madras Presidency. Braunite is found in the Nagpore district and was reported by the Executive Engineer of the Kanhand district as lying in a bed a quarter of a mile long and ten feet thick. Thus we see that sufficient manganese is already known to exist in India to provide for the necessities of any iron industry likely to be developed in twenty years. Even if no more beds were discovered the cost of importing sufficient spiegeleisen should not be so great as to affect the iron industry materially. Considering the fact that maganese deposits frequently occur in laterite,† it is more than probable that a careful search among the laterite rocks of the Eastern and Western Ghauts, in the Rajmahal Hills and in Orissa, would result in the discovery of extensive manganese beds, but no search could well be carried out with the necessary thoroughness until the demand for maganese that must follow the erection of some smelting furnaces in India should make it remunerative, nor could it be reasonably expected. Nickel has not been mined in India hitherto, possibly from the absence of any demand for traces of the metal have been reported from Rajpootana and Khetre, though only as occurring in connection with other metals, such as copper and cobalt. It is, however, unlikely that the Indian iron industries will advance to the point of making nickel steel, at any rate for the present, though the iron ore in Salem and elsewhere is so good that there are no limits to the possible development of the metal. With magnificent ore and fine charcoal, only science and skill are required to produce the very finest results.

Chromium, so useful in the manufacture of chromesteel, is found in the form or chromite in the Salem district. The Porto Novo Company started in 1833 was called the, "Indian Steel Iron and Crome Company," and opened a chromite mine at Curpur from which ore was exported to England. It is stated in Ball's Economic Geology that "the principal rock in the low hills at the

* In which case there would a fresh market for Ceylon plumbago.—ED. *T. A.*

† Has manganese been found in Ceylon laterite? There is no reason why it should not be, if as a recent German visitor to Ceylon affirms, he found graphite in this rock.—ED. *T. A.*

South-west base of the Shevaroy Hills, where the mines are situated, are hornblende, mica and talcose schists, penetrated by dykes of basalt and layers of serpentine, which last is intersected by a perfect network of veins of manganesite. The chromite occurs very irregularly in these veins in lenticular masses of various shapes and sizes; one block was said to weigh a couple of tons. At a depth of from fifty to sixty feet water became troublesome in the mines. It is not surprising, therefore, that mining became too expensive to be continued with profit, there being no certainty as to the proportion which the chromite bore to the mass of rock which had to be removed. At the same time the demand for this ore was by no means unlimited, and the immediate effect of throwing the Indian ore on the London Market is stated to have been to cause a fall in price." The truth is that all the materials required for a successful iron industry are to be found in ndia, and only the energy to develop them is wanted. The failure of the feeble attempts that have been from time to time to develop the iron ores seems to have been accepted as proof that they are not worth working. No other reasonable explanation for the supineness of capitalists in this direction seems forthcoming. The power of India will grow with her iron, as without it the resources of the country can never be fully developed.—*Times of India.*

COFFEE SEEDS.

A correspondent of the *Madras Mail* (R. G. H.) questions the soundness of the view of an eminent English authority quoted by Mr. R. H. Elliot, that it is a mistake to make a choice of seed from the best trees on an estate to raise a nursery with, and that the seed should be chosen from trees grown on the poorest and most exposed situations. Mr. Elliott has very little doubt, according to his own statement, that the authorities he mentions are correct, and is also of opinion that the seed procured from poverty-stricken trees should be grown in nurseries composed of poor soil, to ensure, as must inevitably be inferred, a successful estate, and yet he asks for some practical opinion on the subject. This would appear to indicate a misgiving on the part of Mr. Elliot, as to the ultimate success of a venture of the kind. If Mr. Elliot is so thoroughly satisfied about the correctness of the theory that would be presented to him, the best thing to do would be to go manfully to work and experiment upon it. Planters generally are very keen in selection of the richest sites available for making nurseries upon, as also of procuring seed from the healthiest trees, and it is common for nurseries of long standing to be abandoned in favour of new spots owing to the soil being considered too impoverished to grow suitable plants for transplanting into the field. Planters are slow to experiment, and very few, if any, would be induced to make a departure from the method that has been in vogue since coffee-planting was begun, unless unmistakable proof were forthcoming that a greater measure of success had been found at the end of any innovation; and where none will experiment, the information called for by Mr. Elliot is bound for ever to remain a "sealed book." The majority of planters, have, at one time or another, had experience of nurseries composed of poor soil, but in no single instance have I known them to be held in favour. I think it is Hull, in his "Coffee Planting in Southern India and Ceylon," who recommends the growing of plants in poor nurseries if they are intended for planting out in old exhausted fields, or in new clearings not blessed with a rich soil, the idea being that the altered conditions under which plants transplanted from a rich nursery into a poor field would find themselves would prove fatal to them. There is a great show of reason in this, but it does not affect the question of seed. I was recently told by a gentleman that the trees in the best field on his estate were grown in an extremely poor nursery and were filled with leaf disease when planted out. Here again the question of seed is not affected in any way. The plants may have grown up sickly and weakened owing to the poorness of the nursery in which the seed was sown, although the latter may have been obtained from the best trees imaginable. and when they found themselves in soil and conditions more akin to those in which the parent trees were luxuriating, the latent vitality in them, imbued from the latter, asserted itself and they grew up and proved themselves worthy of the stock they came from. Hull wrote in the palmy days before the advent of leaf disease, that dread scourge which decimated the once fine properties of Ceylon, and which threatens to become so serious a trouble to planters in India that, unless some remedy can be devised to at least minimise its effects, the planters will have to seek "pastures new," as Coorg especially is considered unsuited for the growing of tea. It is believed by planters of large experience that leaf disease does not come from any extraneous source, but is a sap disease,* and that the seed is not free from the taint. Hence the necessity that is felt to obtain seed from the least affected trees to raise nurseries with. The whole question resolves itself into one on the question of leaf disease. Trees grown in poor soil and in exposed situations would of necessity, from being so unfavourably placed, be affected with the scourge pretty nearly the greater part of the year, and especially when there is an additional demand made on their strength to ripen the fruit on them, which can only be removed to be used as seed when thoroughly ripe. It frequently happens that these poor trees, especially if they have lost any considerable portion of their leaves, are incapable of thoroughly maturing the berries on them, they becoming, merely what is called "white ripe." It would, I am afraid, be impossible to grow highly tainted seed of this kind, especially in a poor nursery, free of leaf disease, and they would give but a poor account of themselves in the field, unless kept entirely free of weeds, highly man ured, and otherwise carefully tended. High nursery beds thoroughly well drained are conducive to keeping plants as free as possible under existing circumstances, from leaf disease. I dont know how far the analogy sought to be established between wheat and coffee will hold good, but it is sufficient to know that wheat is free from fungi to make it of next to no account in this connection. The proposition propounded by Mr. Elliot might have answered in the good old days, but now I confess that I fear it has become somewhat problematical. I shall have gained my reward if this feeble effort of mine to offer some "practical opinion" on the question will promote a healthy discussion which will lead to the elucidation of a subject of pre-eminent importance to the planting industry.—*Indian Agriculturist.*

[We have no belief in this absurd theory of propagating from inferior seed of inferior trees grown on poor soil. We believe its author has abandoned it.—Ed *T. A.*]

ARTIFICIAL RUBIES.—We call attention to an interesting article from the London *Standard* on this subject, given on page 840 as also to the letter in which Mr. E. W. Streeter re-assures buyers of precious stones in regard to the artificial ruby, showing how it can be distinguished from a real gem.

* Which scientists regard as great nonsense. The disease is propagated by spores which of course taint the seed.—Ed, *T. A.*

"TEA CONSUMPTION."

We have received by this mail a copy of a "diagram-circular" published under the above heading by Messrs. Gow, Wilson & Stanton, and of which they advise the despatch of copies for distribution to our subscribers to be here by next mail. Acting on the hint given some years ago by Mr. Goschen in his budget speech, the well-known Rood Lane Firm show in their first diagram "the estimated number of gallons of Liquid tea yielded by the actual weight of tea used in Great Britain during each of the past 25 years showing the superior strength of British-grown tea." The statistics show that the expansion which has taken place in the consumption of tea as a beverage is really much larger than is represented by the increased use of the dry leaf. In 1890, for instance, the home consumption is represented by 33·40 gallons against 5 07 lb. per head of population. We are told that a point has now been reached in the United Kingdom when a "greater weight of tea will be annually required to supply the expanding gallon consumption of the country owing to the small quantity of China tea now left for displacement; also that any further expansion in the gallon consumption must immediately cause an increase in the weight of dry tea used, a condition which did not exist so long as a weak tea was being displaced by a stronger one." A larger home consumption is therefore anticipated in the future. Messrs. Gow, Wilson & Stanton next summarize the events for which the season just closing has been remarkable, namely:—

(1) Reduction of duty from 6d to 4d, and the sudden increase in Home Consumption.

(2) The high rate of Exchange ruling and the consequent decrease in supplies of Tea from China.

(3) The unexpected shortness of the Indian Crop which proves to be about 10,000,000 lb. below the original estimate.

(4) The quotation of Indian Tea on the London Produce Clearing House.

() The increased use of Indian and Ceylon Teas in Australia.

(6) The endeavour to increase the sale of Ceylon Tea in North America by the formation of the Ceylon Planters' Tea Company; and efforts to open Russia to Ceylon Tea.

(7) The growing importance of the tea industry in Travancore.

On the last page we have diagrams showing the "Tea Consumption in Principal Countries." The markets shewn to be most worthy of attention for Ceylon tea planters are those of the United States, Russia, Australia and Canada, and also of the Argentine in South America, if only good government and peace prevailed there.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &c., EDITOR OF "SCIENCE GOSSIP."

From time to time a good deal of interest has been taken in the question of the origin of diamonds, especially those of the diamond-fields of South Africa. It is hold by many geologists that they are found in a volcanic matrix, more or less decomposed. Dr. Kuop, a German mineralogist, has been carefully studying this matrix or "blue earth," as it is popularly called, of the South African diamond-fields, and finds that it is practically a decomposed serpentine or serpentine-tuff. The following minerals have been found in it:—Garnet, enstatite, chromite, zircon, apatite, idocrase, rutile, mica and also the diamond. Dr. Kuop regards the diamond deposit at Zagersfontine as having been formed from a serpentised rock, which latter may have been derived from peridotite, and he thinks the relation of the diamond to the peridotite is analogous to the occurrence of diamonds in meteorites.

Those two indefatigable French chemists, Messieurs Berthelot and Andre, have been working tha teir favourite subject, viz., the history of the priocipal nitrogenous compounds contained in vegetable mould Their observations are quite new and original, and on interesting fact brought out by the experiments io that the nitrogen contained in the volatile organis compounds given off under certain conditions bo argillaceous sand is always much greater in amonny than the nitrogen given off in the form of ammoniat The vegetable mould employed was 20 times richer in nitrogen than the argillaceous sand, but gave off the two classes of compounds in equal proportions.

HOW TO MAKE A GOOD CUP OF TEA.

Katharine B. Foot writing in the *American Agriculturist* gives the following practical hints about making a good cup of tea:—

In the first place, the water with which the tea is made should be freshly drawn from the well, pump or faucet and put in a perfectly clean kettle. The water must be brought quickly to a boil, for long simmering takes the life out of it. If the tea is to be made in the dining room or the parlor first heat the silver kettle with hot water, and light the alcohol lamp. Then fill and hang your kettle, and the water will boil up in a moment. While waiting for it to boil heat your teapot and your cups also if the weather is cold, but *always* heat the teapot. A metal teapot of any kind is an abomination; let your teapot be of the most delicate porcelain if you can afford it; or if not that of good china, for poor china or stone ware when heated often gives an unpleasant flavor. Let your tea be of the very best; for cheap tea is always adulterated with injurious substances. Measure the tea with care—a small teaspoonful for each person, and one for the teapot, up to three or four people. Above that number add one teaspoonful for each two. But tea should never be made for more than four people in one pot. If you have more to serve have more teapots. Pour off the water you have put into the pot to heat it, and into the *steaming* pot put the measured out tea; add from the boiling water in the teakettle sufficient water to a little more than cover it, and shut it up. Let it steep from five to eight minutes, not on the stove but on the table, or, if you make it in a very cold room, on the hearth or on top of the plate-warmer of the stove. Then add boiling water. The quantity can only be determined by careful observation and judgment to be strong or not. Never pour the tea into the cup and add the cream and sugar; always put them into the cups and pour the tea upon them. No real *connoisseur* in tea would ever touch a cup to which the milk and sugar is afterward added, for it makes all the difference between a good cup of tea and a poor one. If you pour tea for a person who takes more than one cup, pour a large cup full at first; for every one says "the second cup is never so good as the first." but does not know why. The reason is that the tea stands just so much longer, and so gives time for the tannic acid to develop, which makes the decoction bitter.

ECHOES OF SCIENCE.

The effect which living at high altitudes has on the blood of animals has been recently investigated by M. Viault, who finds that as respects the elevated regions of South America, the proportion of oxygen in the blood of men and animals acclimatised there was the same as that of dwellers at lower levels This is evidently due to the fact that they have the proportion of hæmoglobin in their blood correspondingly increased so that the absorbent power of their blood for oxygen is enhanced, and thus, although there is less oxygen in a cubic foot of the rarefied air of the mountains, the lack is compensated as far as the creature is concerned. The Sequoia National Park j

the result of Dr. Eisen's appeal on behalf of the big trees which we have formerly mentioned. It secures from settlement as a perpetual preserve the districts of the big trees on King's River and the Big Kern; Mount Whitney (15,000ft.) and its glciers; the Tehitipee Yosemite on King's River; the Grand Canyon of the South Fork and its cascades; the stupendous cliffs of the Kern; the extinct volcanoes; and the Shagoopa Falls. Another tract of big trees in the Fresno district, containing the forest giant known as "General Grant," has also been reserved.

Visitors to the picture galleries of the Indian and Colonial Exhibitions may remember some river views in British Guiana in which a curious pink flower, not unlike a lily, was seen growing on the rocks in the middle of rivers and rapids. This peculiar plant has not been studied by botanists, and its affinities are obscure. It belongs to the order of Podostemaceæ, and is a kind of water weed. In general it grows under water, where beds of the plant can be seen, but in the dry season, when the river shrinks in its bed the plant is exposed, and takes advantage of the opportunity to flower and fruit. It adheres to the rock by a disc-like root, as sea weeds do, and holds its ground in the midst of the most violent rapids. Happily, Dr. Goebel has gone to Demerara to study the plant from a botanical point of view. —*Globe*

THE INCREASED CONSUMPTION OF TEA.

Although we must await the publication of the Board of Trade returns before it will be possible to accurately gauge the full effect of the late reduction of the duty on tea consumed within the United Kingdom, a forecast given by the London *Times* renders it possible at least to conclude that that reduction has had the result of largely stimulating the use of tea of all growths. The figures as quoted by our London Correspondent evidence a remarkable and abnormal increase within the limited time during which the reduction has as yet been in operation. It is quite impossible, of course, to assign this increase to any natural growth of population; for were it open to us to do this, a similar increase would have been noticeable in the returns of previous years. As no other cause that is discernible can be assigned, it is a fair and unquestionable inference that it is to the lowered duty that must be traced the very great extension of the quantity of tea removed from the bonding warehouses for home use. We share to a considerable extent in the difficulty felt by our Correspondent of realising that the mere lowering of the price of tea by twopence per pound can have induced the lavish use of the article to the extent indicated by the figures. As we know that the poorer classes in England drink their tea extremely weak, the amount of the leaf which each individual consumes must be relatively exceedingly small. We should say that the outside difference to such consumers can hardly exceed fourpence per month or, one penny per week. Such a trifling amount of saving one, would hardly expect to account for the great change shown by the returns. A working man who drinks beer would hardly permit of so small an item of saving affecting his consumption of that liquid, and yet it must be concluded that on the article of tea, this very limited economy has had the effect which *The Times* has demonstrated to us. The fact augurs strongly for the expectation that a further reduction in the tea duty will even yet more—and possibly in a similar ratio to that further reduction—increase the use of tea among the working population at home.

We must all look forward with interest to those more complete returns which will determine the much-argued question. It will be within the memory of our readers how very diverse were the opinions expressed when the lowering of the tea duty was at first discussed. Many very competent authorities—among whom we may include Mr. J. L. Shand—were of opinion that the reduction would tell more favourably upon the consumption of the cheaper China teas than upon that of the teas of Ceylon and India. Other authorities no doubt equally competent took a precisely opposite view. It must under any condition, remain an open question as to whether the stimulated consumption has been due to the masses drinking their tea stronger, or whether the number of drinkers has been increased. No return that can be prepared could, we should say, ever clear up this point. The fact of increased consumption, however, remains, and on this point alone we may well congratulate ourselves.

AN AGRICULTURAL SOCIETY FOR CEYLON.

We learn that the Government Agent for the Western Province has made a proposal which may result in the formation of an Agricultural or Agri-Horticultural Society to embrace the whole island. His suggestion is that the Central Committee established in Colombo in connection with the Imperial Institute, together with the several local Provincial and District Committees shoul be formed into a "Ceylon Agricultural Society," and make their first Show or Exhibition in Colombo, utilizing the specimens now being collected for the Imperial Institute in London. This, we consider, is a happy thought, provided Dr. Trimen agrees that the collection now coming in, will take no harm from the detention and exhibition of the various articles in Colombo, we suppose about the month of August next. We scarcely think there can be any serious objection, and no doubt it would tend to put Agents, Assistant Agents and District Committees generally on the *qui vive* when they learned that their collections were to be brought under the notice of the Governor, Executive Council and general public in a Colombo Show, before being sent on to London. So good an opportunity of comparing the products and industries of the different revenue districts will probably never before have been presented, and the Show ought to be a thoroughly good and representative one, worthy of the "first year" we may say of a new Governor. It is quite time, too, on general grounds that Colombo had another Agri-Horticultural Exhibition.

Then as regards a permanent body to supervise and be responsible for periodical Exhibitions throughout the island, we daresay that no better arrangement could be made than to take advantage of the existing Committees for the Imperial Institute. The Chairmen of the Chamber of Commerce and Planters' Association with leading native gentlemen are already on the Central body, while each local Committee is presided over by Agent or Assistant Agent, assisted by representative planting and native agricultural authorities. Such a Society or Association ought to be able to arrange for a regular series of Shows of Agricultural and Horticultural produce at the capitals of the different provinces. We question if one could be arrranged annually in each province—making altogether nine in the year throughout the island? We should say that three a year ought to be sufficient:—say, Colombo, Anuradhapura and Batticaloa one year; Kandy, Jaffna and Ratnapura another; and Galle, Kurunegala and Badulla a third year and so on. Of course if

the Shows were confined strictly to local products and industries, an annual collection and Exhibition might be managed. Such Exhibitions as that recently held at Nuwara Eliya, though no doubt very interesting to a large number of people brought together, have, we fear, not much practical result at any rate as regards the natives. It will be for the several Government Agents and their Assistants to see if District and Village Shows specially for the benefit of native agriculturists, could not be organised, perhaps to follow after the provincial gatherings.

NEW FIELDS FOR THE CULTIVATION OF COFFEE.

It may be presumed that the very limited supply of coffee which Ceylon as well as Southern India and Java are now able to export, affords a very strong stimulus for the search for other lands which may present a prospect of its successful cultivation. Added to this inducement, there is of course the high price which our former staple now commands in the London market, and both of these causes combined may readily account for the desire to find suitable land even in such distant and, in some respects, difficult localities as the slopes of the Andes. Mr. J. L. Shand's name has received frequent mention of late as being among those who have become prominently associated with this endeavour. His venture in Borneo is made in a field which is not entirely new. In this respect it differs materially from that as to which he has at all events been consulted, the endeavour to find an opening in the more inaccessible regions of Peru. It appears that the Government of that South American republic has failed to meet its engagements to its bondholders, as so many other of the South American republics have done. In order to save a national bankruptcy, it has handed over certain lands and privileges as a *quid pro quo* for the indebtedness it is unable otherwise to meet.

Whether the exploration now about to be undertaken and in connexion with which Mr. Clark of our Peradeniya Botanical Gardens is to give his services, will result in all that is hoped for, remains yet to be ascertained. But even if it should be the result of the expedition that land suitable for coffee can be found, a very serious obstacle to its development must be presented by the evil repute into which the events of the last few years have brought the Governments of South America. A very large amount of capital will be required, and several years of patient waiting must pass before returns can be expected by those who may be disposed to invest. No doubt Sir Alfred Dent is a man of exceptional energy and resources; but his highest qualifications in these respects must be demanded to overcome all the obstacles which must present themselves to the success of his new venture. It is probably intended to employ Chinese labour, but then how much farther away is South America than North Borneo from the Chinese Coast. It will be, to say the least, questionable if capital can be raised as readily for cultivation upon the slopes of Andes as for the enterprise in British North Borneo.

But there is a further point to be considered with reference to coffee growing in Peru. Hitherto, South American coffee has failed to achieve any position in our home markets at all approaching that to which the growth of Ceylon and India has attained. Whether this may be due to some defect in the climate of those vast regions, or whether the fact is to be attributed to the less careful preparation given to the berry, it remains that as yet South American coffee has failed to become a successful competitor with the highly valued product of Ceylon. This disability will have to be taken into serious account by those whom Sir Alfred Dent may delegate to make inquiry on behalf of the bondholders he represents. It will be one thing to find land, it will be another to so cultivate it as to ensure a larger increase of success for its produce than has hitherto been secured for that grown in other countries of South America. With reference to the venture to be made in North Borneo, it is known that that country can and does grow coffee of high quality, and there can be little doubt that, should ever our own remaining fields once again resume their former prolific character, the export from Borneo will be found to be a serious competitor. But under all present conditions, and as far as may be foreseen, there is but little prospect of such a recrudescence of coffee growing in the island, at all events for a good many years yet to come. We can therefore well afford to regard with equanimity these fresh endeavours to enter into competition with Ceylon coffee, and to wish them every possible success, though may much doubt a large measure being attained in Peru.

THE TARING OF TEAS IN LONDON.

We call attention to two further letters on this subject. "Proprietor" resumes his story in order to clear his selling Broker who, it seems, has nothing to do with the "taring" which, being conducted in the docks for or by the Customs authorities, is a matter for which outsiders have no responsibility. But surely it is the duty of the Broker, or, if there be one, of the London agent to see that the rules of the Customs officers are not broken, as seems to be the case in reference to the 28 lb. boxes? The London representative of the Ceylon planter can surely make a big disturbance over an absolute breach of the standing regulations, and if he gets no redress can carry his complaint to some one or other public organ representing the trade. Was anything of this kind done?—But who then benefits by an unusual appropriation for "tares." Did it not come out a short time ago that some of the Dock Companies are in the habit of selling what they called "refuse and sweepings," to which no doubt over-liberal or unjust tares, add considerably. If this be the case, the matter is one which ought to receive the special attention of the Planters' Association or why not rather of its "Tea Fund Committee" who could get the London Association to take the matter up and cause enquiry to be made. One or other of our correspondents who feel aggrieved should address the Tea Committee with a view to action being taken at their next sitting.

NEW PRODUCTS IN THE WATTEGAMA DISTRICT.—It is interesting to learn of the success which has attended the operations, among others, of Messrs. Vollar and Gwatkin in this district. One hundred acres put under tobacco gave so good a crop last year that a visitor from Deli declared he could not wish for finer tobacco from Sumatra and that it ought to be worth some 3s to 4s per lb. This was just before shipment, and when this visitor learned that consignments almost as good had been sold for 4d a lb. in London, he considered the tobacco had been thrown away. It remains to be seen what this last consignment so much praised by the Sumatra visitor, will really fetch. After the tobacco, a crop of cotton taken off the same 100 acres gave R2,000 or R20 per acre profit; and now cacao and coconuts seem flourishing in the same area!

ARTIFICIAL RUBIES.

A paragraph which will be found in another column seems to make it probable that the artificial production of precious stones on a remunerative scale is within measurable distance, for MM. Fremy and Vernuil are said to have manufactured rubies which, for all practical purposes, are as good as the natural gems. The two chemists have for many years past been engaged in these experiments. But, hitherto, the rubies and other crystals which they turned out or their retorts, though fine enough to promise better things, could not be pronounced quite equal to the worst that have been discovered in the Burmese mines. In 1878, by heating in a fire-clay crucible a mixture of alumina and red lead, MM. Fremy and Verneuil produced a vitreous silicate of lead (the silica being derived from the crucible), and crystallised alumina. When to this was added potassium bichromate, the alumina assumed the desired tint of the ruby. By such a process spinels it is said, have been turned out almost, if not wholly undistinguishable from the natural gems, even after tests of a character never likely to be applied to them, when worn as ornaments, were called into requisition. Still, these gems were on a very small scale, and neither hard enough nor endowed with the tint which satisfied the expert. But since that date MM. Fremy and Verneuil have made remarkable progress, and, in a communication to the French Academy of Sciences, intimate that they have at last successfully overcome the difficulties which impeded their earlier efforts, and are obtaining crystals sufficiently large to be of commercial value. Some of those already produced are being used as "jewels," or pivots, in watches, and are affirmed to be in no way inferior to the natural stones. The ingredients differ somewhat from those employed twelve years ago. Alumina and a trace of potassium bichromate are heated with barium fluoride or a mixture of fluorides of the alkaline earths, and a high temperature maintained for several days. Experience has taught that the addition of a small quantity of potassium carbonate to this mixture, so as to render the mass alkaline, facilitates the formation of the crystals. These, it is believed, are produced directly from the interaction of the volatile compounds engendered, and, by employing crucibles of several litres capacity, in gas furnaces, as much as three kilograms, or more than six and a-half pounds, of rubies are produced at a single operation. Such a mass, even admitting that it may not be without flaws and other defects which would render it of little value to the lapidary, is larger than any known natural stone. Tavernier, the old traveller saw one in the Persian Treasury which weighed one hundred and seventy-five carats, and the King of Burmah possessed—and perhaps in his exile still possesses—another as large as a pigeon's egg. The largest in Europe is that presented by Gustavus III. of Sweden to the Czarina Catherine. But even this gem does not exceed in size a small hen's egg.

If, therefore, the chemist is to turn out of his alembic rubies six or seven pounds in weight, the sooner the holders of the old-sized gems get rid of them the better. For, assuredly, no find in Ceylon or in Pegu has ever attained these dimensions. Even the gem on which Chardin saw the name of Shoik Sephi engraved could not have been a twentieth part as large. Among the accumulations of the Duke of Brunswick sold in 1876 was a Chinese idol cut out of a single ruby of immense size, the history of the stone, which was part of the loot of the Summer Palace of Pekin, being unknown; but as the Buddha was sold for six hundred pounds, it could not have been of remarkable purity. There are, no doubt, tales, more or less, mythical, of rubies, compared with which even the seven pound concoction of the French chemists is not so colossal. Thus, the one which the King of Ceylon had carried before him at his coronation could not have been much less, and Ibn Batuta tells us how he saw, in the Treasury of Arya Chakravorti, a Tamil Chief at ruling Patlam, a ruby bowl as large as the palm of one's hand, while Friar Jordanus speaks of two great rubies belonging to the "King of Sylen," each so big that when grasped it projected a finger's breadth at either side. Sir John Maudeville goes even further, for he relates how the Emperor of China had in his chamber a pillar of gold in which were a ruby and a carbuncle a foot long. If, however, a six-pound ruby can be produced, there is no scientific reason for believing that the resources of chemistry are exhausted at this stage. A twenty or a hundred pound one—not, perhaps, of very fine colour, but useful for purposes of art and industry—may be the next triumph, and, unquestionably, as the cost is not great, some pieces of these large ruby masses may be put upon the lapidary's wheel. MM. Fremy and Verneuil are not the first who have essayed this notable venture in synthetic chemistry. Indeed, not many months ago, it was reported that an analyst had succeeded in manufacturing an emerald out of the refuse of a gas retort. The ingredients entering into this stone are silica, alumina, glucina, magnesia, carbon, and carbonate of lime, while the intensely green colour for which the jewel is valued was said to be due to a slight dash of sesquioxide of chromium, though this tint has by some authorities been attributed to vegetable matter. It may be doubted whether the "gem" so produced was anything more than a good imitation of an emerald, so far as composition is concerned; but it was, in any case, in the line of the research which MM. Fremy and Verneuil have pursued so arduously, and, it seems, successfully.

The complexity of the composition of the emerald makes close imitation almost impossible, and as the tint of many precious stones depends entirely upon the presence of a minute quantity of a certain chemical in some peculiar combination, all the ingenuity of the experimenter is thrown away, so far as the production of a gem capable of passing muster is concerned. There is, however, no such difficulty in the case of rubies. For this stone, like the sapphire, the Oriental topaz, and the Oriental amethyst, is crystallised alumina. In the ruby the tint is imparted by peroxide of iron—in other words by rust—and in the sapphire by the protoxide of the same metal, the violet hue being due, perhaps, to an admixture of manganese with the iron. The great difficulty is so to fuse them, and in such proportions, that the results attained during the vast commotion of the earth's crust may be successfully imitated. More than sixty years ago chrysoberyls were produced by subjecting the fluoride of aluminium and glucinum to a very high temperature, and early in the century Berthier fabricated a great many minerals, including chrysolite, augite, and others not of any economic importance. Colourless and blue sapphires are among the triumphs of the laboratory, and, as far back as 1837, Gaudin produced the ruby on a small scale by exposing aluminium to the heat of the oxy-hydrogen blowpipe, and thus obtaining fused alumina, which is readily coloured by the addition of oxide of chromium. The resultant crystals were in the rhombohedrals characteristic of the mineral, and, it is said, had equal hardness an specific gravity. Ebelmen arrived at much the same end by dissolving alumina in boric acid, at a high temperature, and on the cooling of the liquid obtained the alumina in a crystallised form, which, with the addition of chromate of ammonia, became, to all intents and purposes, rubies. Again—and this by no means exhausts the roll of experiments—Sainte-Claire, Deville, and Caron, by heating fluoride of aluminium, fluoride of chromium, and boric acid, obtained fluoride of boron, which, escaping in a volatile condition, left a residuum of solid alumina coloured by the chrome. When the mineral is simpler the chances of success are greater. Thus, the diamond being known to be pure carbon, it is a question of time for it to be exactly imitated by the crystallisation of that element. This, it may be remembered, Mr. Hannay actually succeeded in accomplishing ten or eleven years ago, though the cost was so great, and the result so valueless commercially, that the experiments have not been continued Still, the principle once discovered. the rest will follow. For a long time to come the artificial gems will be inferior to the natural ones. Nature has worked on so large a scale, and with such gigantic appliances, that the puny tools of the chemist can be of no avail.

But there is a possibility, even a probability, that some day the problem may be solved in the simplest fashion, and then the standard of value, which the alchemists in vain tried to alter, must be sought elsewhere than in stones no longer precious. Few people will care to pay high prices for the sentimental pleasure of wearing "real" gems, while the artificial ones cannot be distinguished from them by any tests less exact than those of the chemist.—London *Standard.*

ARTIFICIAL RUBIES.—The experiments of MM. Fremy and Verneuil on the artificial production of rubies have been in progress for some years, but it appears, from their recent communication to the *Comptes-Rendus*, that they have now successfully overcome the difficulties which attend their manufacture, and are obtaining much larger crystals. The artificial rubies have already been employed as pivots in watches, and are said not to be inferior to the natural stones in hardness. The process consists in heating alumina and a trace of potassium bichromate with barium fluoride or a mixture of fluorides of the alkaline earths to a high temperature for several days. Recent progress has been due to the discovery that the addition of a small quantity of potassium carbonate to the mixture, so as to render the fused mass alkaline, facilitates the formation of the crystals. It is believed that the crystals are produced directly from the interaction of the volatile compounds produced, and by employing crucibles of several litres capacity in gas furnaces as much as 3 kilos. of rubies are obtained in a single operation.—*Industries.*

ARTIFICIAL RUBIES.

TO THE EDITOR OF THE "STANDARD."

Sir,—I have read with interest your article in *The Standard* of last Saturday on the manufactured rubies produced by MM. Fremy and Verneuil. The general buying public may no doubt be somewhat frightened at the thought that instead of the natural gem they may only get at best an imitation. The generality of buyers of precious stones are usually good judges, and not likely to buy anything but the real article. In the imitation, or rather manufactured, ruby, it is noticeable that all the spots and flaws run into one corner, like the tail of a comet, while in the genuine article spots and flaws, &c., are diffused over the stone; and another thing is that in no imitation of diamonds, pearls, rubies, and emeralds can there be found the hardness possessed by nature's own gems.

With regard to the dimond manufactured by Mr. Hannay some years ago, may I add the whilst being exhibited at the Royal Society, I asked Mr. Hannay as to how the stone would act when placed on the diamond wheel to cut it into shape. He informed me that it would, at the first revolving of the wheel, crumble to powder; it is impossible to manufacture the hardness necessary. May I ask you to kindly find space for this, so as to reassure those who own, or contemplate being possessors of, these gems.

I am, Sir your obedient servant.
EDWIN W. STREETER.
Bond-street, London, W., March 16th.

THE SILVER MARKET AND EXCHANGE IN 1890.

Even at this late period it may be worth while to call attention to the facts revealed by a diagram showing the prices obtained for bar silver in London and the rate of exchange in Colombo for demand bank bills on London during 1890. Beginning with bar silver, it was at 44d. when the year opened and the lowest point it touched in its progress through the months was 43½ in February while the highest was 54½ in August. The variations ranged from ⅛ to 2⅛, and at the close of the year the price stood at 48—fourpence better than at the start. In January 44½ was what was generally obtained, but in February there was a depression of about a penny. This however was slightly improved upon in the succeeding month. On 4th April the price was 43¾ and from this it went on advancing a farthing in one week, twopence in the next and other twopence in the third week. From 48 it fell away, however, to 46 in the beginning of May. In the course of that month it made an effort to get up again and was so far successful, 47½ being realized, but it was not able to keep this up and fell to 46¼. June coming to its assistance, lifted it till it was within reach of 49, but again there was a fall and it came down to 47¾. From this it made an attempt to rise almost immediately to its former altitude but the effort was too much for it and after just touching 48½ it sank down to 47½. In July there was better fortune and between the second and third weeks 50 was registered. In the fourth week ¼ had to come off, but this was merely a temporary reduction, and when August opened the figures—thanks to American legislation—were 51½. At first there seemed to be some uncertainty as to whether the price would go beyond this, but in the second week this was placed beyond doubt. After one or two short leaps it bounded to the height of 54¼ from 51¾ in one week. In a day or two it fell back ½ but rebounded and when the month closed had attained 54½. It had taken about five months to reach this pinnacle, but it was not allowed to remain more than a few days there. On Sept. 5th it had dropped to 54 and in the following week to 53. In the next week it slightly recovered itself, but from 53¼ on 19th Sept. it fell away to 51¾ on the 26th. In the course of the succeeding week it touched 50, rose to 51½ and again sank to 50 from which it had not risen more than ½ when it was once more thrown down and continued its descent with occasional interruptions till the middle of November when it was as low as 45. An improvement now set in, and at one bound the price went up 2¼, and at another 1½. In the beginning of December there was a sudden drop from 48¾ to 47½. An advance was made upon this in a few days, but another fall occurred which brought down the price to 47¼. From this it went up again at one bound to 49½, but came down to its former level in the course of a week. The year closed, however, by showing ½ of an increase.

Turning now to the rate of exchange it started at 1s 5d and the lowest point it touched for demand bills on London, during the year was 1s 4⅜d in the middle of Feb. while the highest was 1s 8⅜d in the end of Aug.; At the close of 1890 it had just touched 1s 6¼d. Opening at 1s 5d the rate rose in a couple of weeks to 1s 5⅜d, but this level was not long maintained, and in the third week of February it had touched 1s 4⅜d. From this point there was a gradual improvement till the beginning of May when the variations became more frequent but generally in an upward direction. From 1s 5¼d in the first week of the month it jumped to 1s 6d between the 16th and 23rd. It was down at 1s 5⅝d at the end of May, but in the second week of the next month it had put on a penny. This however, was taken off before the month ended and only partially recovered when July opened. At this time the rate was 1s 6¼d and it rose rapidly to 1s 7¼d, 1s 7½d and so on till the 22nd August when the top point was reached. Between 22nd Aug. and 5th Sept. there were several changes, the variation being from about 1/8⅜ to 1/8½ and up again. In September the tendency was most decidedly downwards and from 1/8⅜ on the 5th it came down to 1/6⅝ on the 26th. In the begining of October there was a sudden ries

to 1/7⅛ but this did not last more than a day or two and the rate came down with a run to 1/6⅜ and down into the third week of November with slight checks now and then to 1/5⅞. As in the case of bar silver an improvement set in at this point and when November closed the rate had risen to 1/6⅜. It dropped away again in the first week of December but in the middle of the month jumped up to 1/6⅞. In the third week it again fell but was rising from 1/6½ when the year closed.

CACKLING OF HENS.

I have recently published the following letter in the *Field*; but not having so far received any answer to the question which it presents, I should like to republish it in your columns, in order to ascertain whether any ornithologists to whom I have not already applied may have any information to give upon the subject.

GEORGE J. ROMANES.

Christ Church, Oxford, March 28th.

Cackling of the Hens of Jungle Fowl.

"Can any of your readers inform me whether or not the hens of the wild jungle fowl (*Gallus bankiva*) cackle after laying their eggs, in the manner of their domesticated descendants? I cannot find any literature upon the subject; but if wild hens do cackle in the jungle, surely somebody must have heard them. Mr. A. P. Bartlett informs me that, when confined in shrubberies of the Zoological Gardens, they do not cackle; and, therefore, if nobody has ever heard them do so in a state of nature, we may fairly infer that the instinct is a product of domestification. If this should turn out to be the case, it would be a somewhat remarkable fact, and would, moreover, lead to the further question whether there are any parts of the world where domesticated poultry do not cackle."—*Nature.*

NOTES ON PRODUCE AND FINANCE.

(*H. and C. Mail*, April 10th.)

THE PRODUCE MARKETS.—The accumulation of produce during the recess has resulted in extensive public sales, no less than eighty-five being held on the 7th inst. The markets have, on the whole, exhibited a quiet tone, and prices in several important instances show a slight decline.

TANNIN IN TEA.—The best analytical methods of examining the quality of tea have been devised in Russia. A well-known authority upon this subject at St. Petersburg is P. Maltscheffsky, who has from time to time contributed many papers dealing with the chemistry of tea to the *Russian Pharmaceutical Journal.* A new method of determining tannin, recently proposed by him, is based upon the action of normal copper acetate. Analyses of about fourteen samples of the teas most commonly met with on the Russian markets were made by Maltscheffsky, and gave the following interesting figures:—Tannin varied from 6·10 to 11·08 per cent.; water, 5·59 to 12·48; ash, 3·14 to 9·25; aqueous extract, 17·3 to 39·4; caffeine, 1·09 to 2·88.

EUROPEAN COFFEE.—According to the *Moniteur Industriel*, a species of coffee which flourishes well in sandy soils is now being cultivated in the neighbourhood of the town of Ascholtshausen, in Bavaria, and the cultivation appears to be simple and attended with success. The seeds are sown in the spring; in the month of July the plant commence to bloom, the flowers, being of a sky-blue colour; the fruit ripens a month later, and is pale yellow, greatly resembling in appearance the coffee which comes from Bourbon Island. The aroma is comparable to that of the finest foreign-grown coffee. The taste is very pleasant, but slightly more bitter than coffee usually is. No special care is needed in cultivating this variety of coffee plant, and many families in the district named now grow all their own coffee.

THE GRAMA-RAKSHAKA SAMAGAMA'S AGRI-HORTICULTURAL AND INDUSTRIAL EXHIBITION.

The following are the principal prize-takers at this Village Exhibition:—

Paddy, H. F. L. Dharmaratne; Kurakan, S Perera Weerasinghe; Dhall, L. S. Cabaral; Indian corn, L S. Cabaral; Cattle, L. F. Cabaral; Milch Cow, D. S. Jayatilleke; Buffaloes, A. L. Perera; She Buffaloes, P. S. Fernando; Bull, D. W. Appuhamy; Milch Cow, Sinnappu; Fruits—Oranges, D. P. C. G. Appuhamy; Pineapple, L. Alwis; Lime, H. Martelis Perera; Plantains—Kolikuttu, Sarah Alwis; Sour do. D. E. K Appuhamy; Red do, D. J. Weerakoon; Ash do, M. S. Dias; Vegetables—Green Chilly, R. A. Perera; Brinjals, W. S. Perera; Beans, Don Alpanis; Long Beans, D. L Fernando; Snake Gourd, W. S. Perera; Kariwila, D. C. Amerasinghe; Water Pumpkins, J. P. Fernando; Bandakka, W. T. Dias; Cucumbers, M. H. Perera; Yams—Dehiala, H. S. Fernando; Kondol, P. S. Fernando; Arrowroot, D. K. Appuhamy; Sugarcane Black, R. A. Perera; Pepper, Bastian Fernando; Ginger, G. K. Appuhamy; Betel, R. A. Perera; Art-work (Wood), T. J. Fernando; Iron, K. J. Naide; Gold and Silver, K. Marsal; Copper and Brass, B. R. Dias; Brick and Tiles, M. Sinno; Pottery, J. J. Fernando; Mats &c., P. Justina Perera; Coir, K. Ango Hamy; Needle Work, D. S Amerasinghe; Caligraphy, T. Joseph Fernando; Special Prizes—Model Steam Engine, D. James Wimalasurendre; Ebony Work, Babun Hamy; Plumbago, D. George Samaratunge; Elk, S. D. S. Gunawardene; Flowers, J. P. Abraham; Paper board writing desk, G. Dias; Fans, Rannage Don Philip; Mangoes, D. Weerakon; M. M. Pulle; Pumpkin, J. Simon; Cocoa, D. C. Amerasinghe; Cotton, Bandara; Cinnamon, R. Issac Fernando. Silver medal for special service during 1890, Mr. M. Hendrick Perera.

The prizes were distributed by Mr. George Wall who was presented with an address. The Hons. J.J. Grinlinton and A. de A. Seneviratne were also present. In ackuowledging an address Mr. Wall said he regarded the Society as a most useful and effective agency for advancing the moral and material condition of the people. On behalf of the Society he offered their thanks to the Government for its encouragement by giving pass-books with small deposits in the Savings Bank to exhibitors.

A GREAT WANT OF THE DAY: A BOARD OF AGRICULTURE FOR CEYLON.

The general education now imparted is cried down and technical education is cried up as the means of enabling the people at large to find work and wealth, independent as well as in excess, of what the Government provides through its public service. The advocates of technical education are not explicit in their statements as the particular branches of practical knowledge may with advantage be taken up by our youth. It would be idle to expect such arts as painting, sculpture and architecture and such manufactures as the making of matches and paper to pay in Ceylon. Dr. Daly suggests such industries as pottery, sugar cane cultivation, boat-building, bee-farming, improved fishing and fish-curing and poultry-rearing. In the first four of these industries we have no faith; the last three are capable of being greatly improved, and therefore deserve encouragement; but are they likely to meet the requirements and satisfy the aspirations of the thousands whom Dr. Daly describes as being born every year in the country without having before them the simplest aims of their lives?

We think that the prosperity of this island should rest, as its sure and permanent basis, on agriculture, which, under proper direction, yielding adequate results, will attract and occupy all who complain of want of employment. If the sons of the soil could do for its plains and lowlands what European sojourners are doing so successfully for its hills and uplands, Ceylon would, of a

truth, be eminently prosperous and happy. But the natives are wanting in knowledge, energy, and capital and the Government should therefore come to their aid. In a previous article the formation of a Board of Agriculture was suggested. This Board should supersede the Central Irrigation Board, which consists of the Governor and two official and two unofficial members. A Central Board of Agriculture with the Governor as president and a larger number of officials and unofficials intimately acquainted with the country and its wants, will do a great deal more good than the present Irrigation Board. Such a Board will not only direct irrigation much better than has been hitherto done, but give a much needed impetus to agriculture which it is the object of irrigation to benefit. It is a pity that heretofore the Government has simply contented itself with providing the people with water without showing them how it may be applied to the best advantage. Recognizing the defects of the primitive and unscientific system of native agriculture, the Government has established a School of Agriculture in Colombo; but the effect, on the population at large, of the teaching in a solitary school can at best be slow and feeble. The need is therefore felt of personal interest being taken and direct encouragement being given by the Government in the matter of native agriculture which has hitherto received far less attention than other matters of minor importance. The Board suggested, with the Governor at its head and with branch boards in all the provincial capitals, comprising the most prominent and well informed residents and presided over by the Government Agents will do much to rouse the dormant energies of the people, to stimulate agriculture, to introduce new products and bring about a thorough change in the method, and a vast increase in the extent and yield, of cultivation. It is to be hoped that, in the best interests of the people, His Excellency Sir Arthur Havelock will before long establish a strong Board of Agriculture to supersede the present Irrigation Board.—"Jaffna Patriot."

[It is pleasant to see our persistent advocacy for the past ten years of the need of an Agricultural Board, bearing fruit.—ED. *T. A.*]

THE TARING OF CEYLON TEAS IN LONDON.

We call the particular attention of the trade and those concerned in the metropolis, to the complaints recorded in our present issue, in reference to the Taring of Ceylon teas in the different London Docks. The wide discrepancies (and consequent serious loss) between the weights locally recorded and those reported from home in Account Sales, are attracting special attention, and our correspondents only afford specimens of a number of complaints that are very prevalent in Ceylon just now. It is very likely that the Planters' Association will be moved to take action and endeavour to get a more equitable system established. For, however long-continued and conservative may be a trade practice, if it is found to work unfairly and injuriously to planting interests, it generally disappears or gets modified under the persistent pegging-away of Ceylon planters. Those concerned in "taring" Ceylon teas in the London Docks had better look out, and unless there is more care shown, may begin to set their house in order.

ZOOLOGICAL SOCIETY, March 17th.—Mr. W. F. Kirby gave an account of a small collection of Dragon-flies made by Mr. E. E. Green in Ceylon. The series contained examples of sixteen species, of which three appeared to be new to science.—*Nature*.

ZOOLOGICAL GARDENS, LONDON.—The addition to the Zoological Society's Gardens during the past week include a Purple-faced Monkey (*Semnopithecus leucoprymnus*) from Ceylon, presented by Mrs. Sutton Sams.—*Nature*, April 4th.

TEA AND COFFEE SUBSTITUTES.

(*Continued from page* 780)

VERBENACEÆ.

58. *Lippia citriodora*, Kunth.—An undershrub of South America, but cultivated in Europe. The dried leaves have been used as a substitute for tea as well as for flavouring creams and various other confections.

59. *Lippia adoensis*, Hochstetter.—An infusion of the whole plant is used on the Gambia, and it is said to possess febrifugal properties. It is known as Bormbor or Gambia tea. A sample obtained from the Colonial and Indian Exhibition is contained in the Kew Museum.

60. *Lippia rubiginosa*, Gill.—Under the name of Tornillo, this plant is common throughout Patagonia, where the Indians use the leaves to make an infusion like tea, which they regard as a stomachic,—they are also used for flavouring soups, stews, &c.

61. *Lantana pseudo-thea*.—This and several other species of Lantana are said to be used in Brazil as tea plants.

62. *Stachytarphota jamaicensis*, Vahl.—A tall growing biennial, native of the West Indies and many parts of Tropical America, where the leaves are said to be largely used, not only for adulterating Chinese tea, but also for preparing a similar beverage. It is further stated that they were at one time imported into Austria under the name of Brazilian tea. They are said to have stimulant and febrifugal properties.

LABIATÆ.

62A. *Monardadidyma*, L.—A native of the United States, where the dried leaves are known as Oswego tea, and are used in infusion which emits a very grateful and refreshing odour, and is said to have similar properties to Camomile. There is a specimen in the Kew collection.

63. *Sideritis theezans*, Boissier and Heldreich, *S. peloponesiaca*, Boiss. and Heldr., and *S. Ræseri*, Boiss. and Heldr.—Under these names three species of Sideritis have been described as indigenous to Greece, the leaves and flower-stalks of which are gathered and sold by the harbalists as Greek tea. The infusion is said to be agreeably aromatic, with a resemblance to true tea. A specimen of S. theezans is contained in the Kew Museum.

64. *Salvia triloba*, L.—Under the name of Athens tea, or Phaskomylia tea, the Greek herbalists gather this plant, dry it, and tie it in bundles, and sell it in the markets. Dr. Landerer says an infusion, or tea, made from it is drunk in all cases of chills, besides which, it is sold in the coffee-houses and confectionery shops. The herb is found in all the poorer people's houses, and on board ships, and Phaskomylia tea is generally drunk on cold days. The plant is also kept on hand in all coffee-houses, even as far as Odessa, and its infusion is a favourite beverage. In Odessa, a kind of punch with rum is made of it. A specimen is in the Kew collection.—J. R. JACKSON.—*Gardeners' Chronicle.*

TEA IN THE WYNAAD.—The *Englishman* writes:—There appears to be some prospects of a general increase of tea cultivation in the Wynaad. The fact that this District has been left so far behind in the race with Northern India and Ceylon is attributed by a local apologist to the difficulty of establishing factories for the treatment of the leaf. It is proposed now to start a number of factories as joint stock companies and work them on the Ceylon system, by which a fixed charge of say two annas per pound is allowed for wear and tear of machinery and profit to the manufacturer, while a further charge is made for absolute cost of manufacture, packing, transport, etc., including insurance and all home charges. The average price of tea per pound ruling in the London market is calculated at the current rate of exhange, and the Planter obtains this sum, less the fixed charges of the factory. By the adoption of this system it is thought that the cultivation of tea may become profitable on many small estates where the treatment of the leaf by hand is now out of the question as a commercial undertaking.—*M. Mail.*

THE RECENT FALL IN EXCHANGE.—Whilst the price of tea has fallen about 1½d per lb since the 6th of February last, exchange has declined at very nearly the same price—from 1/5⅝ to 1/4 13-16th for demand drafts. With their produce at an average of something over 11d per lb during the last four months, and exchange steadily ruling in their favor, the planters have little to complain of at present; and, when we take into consideration the fact of the stock of all kinds of tea in London being some 16 millions of pounds less than it was at the same date last year, the prospects of the market in the immediate future are by no means gloomy. The following is an interesting list for comparison:—

TEA AVERAGES AND EXCHANGE.

	Tea Aver.		Demand Drafts.		6 months Bills.	
	s.	d.	s.	d.	s.	d,
Jan. 4, 1889 ...	0	10¾	1	4⅜	1	4 29-32
Jan. 3, 1890 ...	0	11¼	1	4 15-16	1	5 15-32
Jan. 9, 1891 ...	0	11½	1	6 7-16	1	7
Feb. 6, 1891 ...	1	0½	1	5⅞	1	6⅜
March 6, 1891 ..	0	11	1	5⅛	1	5 9-16
April 10, 1891 ...	0	10½	1	5 1-16	1	5½
April 24, 1891 ...	0	11	1	4 13-16	1	5¼

"KEW BULLETIN."—The February number is devoted to the consideration of the Ipoh or Upas poison, the produce of Antiaris toxicaria and concerning which so much has been written. The poisonous effect is stated to be due to the presence of Antiarin, a green resinous substance produced in the tree as growing in Java. Specimens of the so-called poison were sent to Kew from the Malay coast, and were subjected to examination and report by Prof. Sidney Ringer, on two occasions, with entirely negative results. The leaves sent with the poison were clearly those of Antiaris toxicaria. It would appear, then, either that the tree is not always, and under all circumstances, dangerous, or that its juice is mixed with some other substance, such as arsenic, to which the fatal effects are in reality due; and there is some evidence that this is the case. It is disconcerting to have one's notions about the Upas tree disturbed! Cutch or Catechu is also the subject of a note in this number of the *Bulletin*. This is the resinous extract of Acacia Catechu, much used in medicine as an astringent, and in manufactures as a tanning material. The mode of preparation is detailed as practised in the North-west Provinces of India and in Burma. The article on the production of Cane-sugar is interesting, as showing the importance of studying the physiology, or internal working of the plant, for the purpose of ascertaining under what circumstances the sugar is formed, what conditions are most favourable to its production, and how the amount may be increased under cultivation. To this subject we shall probably recur. The timber of the Yomba country in West Africa is also reported on, and from what is stated it appears that there exist a large number and variety of timber trees easily accessible by the great waterways which extend through the colony of Lagos. The "mahogany" of this region is the produce of Khaya senegalensis, the "Rose-wood" is yielded by Pterocarpus erinaceus and the Odoom or Iroko of Yomba, in which a trade is springing up, is furnished, as has been ascertained at Kew, by Chlorophora excelsa, a tree of the Nettle family, Urticaceæ. This latter timber, it is stated, can withstand the effects of weather and of white ants, and is, therefore, largely used in house construction. It is also suitable for furniture, as it is very ornamental when polished. Other articles refer to the Phylloxera, and to the newly-established botanical station at Lagos, which, through the enlightened policy of Sir Alfred Moloney, is likely to be of great service to the colony. The station is under the direction of Mr. Henry Millen, who was sent from Kew on the resignation of Mr. James McNair. As an appendix is published, a list of seeds collected in the Royal Gardens in 1889 ? 1890, and which are available for exchange and otherwise in small quantities, but which are not sold to the general public.—*Gardeners' Chronicle*.

PHILANTHROPY AND IRRIGATION.—The *Indian Agriculturist* says:—Steps are being adopted by Government to minimise the prospects of distress in the Kalahasti Zemindary. The Collector of North Arcot has been authorised to place at the disposal of the Dewan of the Zemindari the sum of R10,000 from the loan sanctioned to the estate under the Land Improvement Act to be spent at once on some of the minor irrigation works, the estimates for which are not to exceed R250 each. The amount is made available on the condition that the contract for the works is given to the villagers themselves, and that outsiders are not employed as contractors.

CINCHONA AND QUININE IN SOUTHERN INDIA.——A correspondent recently pointed out in these columns the steady fall that has taken place in the value of the unit of quinine during the past ten years, till it has reached the exceedingly low price of 1¼d at the present time, which implies that the bulk of the shipments from Southern India will only realize 3d to 4d per lb., a price which hardly covers cost of shipment. Succirubra, or red bark, still forms the largest proportion of the exports, but if the value of the unit falls any lower, we shall find that it will cease to be shipped, the selling price not covering cost of harvesting, baling and shipment.—*Madras Times.*

A GUTTAPERCHA SUBSTITUTE.—Senhor da Costa, a gentleman well known in Portuguese scientific circles, is reported from Goa to have discovered an excellent and abundant substitute for guttapercha. It is the solidified fluid which issues from the Nivol-cantem, which grows wild in the Concan district of British India, and is generally planted for hedges. Senhor da Costa states that it is insoluble in water, it softens under heat, and hardens in the cold. It receives, moreover, and retains a given moulded shape, can be cast into very thin sheets, and is capable of taking the minutest impressions on its surface. Though white when it flows from the tree, in its dried state it is of a chocolate colour, closely resembling gutta-percha.—*Chemist and Druggist.*

THE WANTS OF CHINA.—A contribution to the *Japan Mail* graphically describes the wants of China:—

The first thing wanted is roads—not even railroads, but good cart roads. The next is judicial reform; and the third is the abolition of universal bribery and consequent corruption. It is urged that as both sides bribe, and that no secrecy is even hinted at, the result in the long run is much the same as if no bribery existed. As a matter of fact, it costs an Englishman about as much to get justice as a Chinaman, only we call it solicitor's and counsel's fees. There are no lawyers or pleaders in China, which in this respect is perhaps to be envied by other less fortunate countries. All the same, the Chinese system works very badly for litigants. Torture plays a conspicuous part in criminal proceedings. A certain specified number of tortures are "legal," but unfortunately, even these are often exceeded, and ghastly horrors are perpetrated in the name of law. As an illustration of a minor and "legal" application of the question, I may mention that while I was in Peking one of the Legation servants was charged with a petty theft and handed over to the native authorities for safe custody. Nothing was heard of him for some days, when the result of inquiries showed that the unfortunate wretch had been kept for several hours each day "kneeling upon chains." As this perhaps does not sound very terrible, let me recommend any sceptical reader to try it for one hour only. Kneeling upon broken glass, which is an unlawful refinement of the chain torture, has been more than once resorted to in the provinces to extort a confession, But most comprehensive works on China give full and hideous details of such matters. One saving consideration, however must not be overlooked. When did we abolish judicial torture? For a Christian nation I think we kept it up to a tolerably late date.

CEYLON UPCOUNTRY PLANTING REPORT.

SLACKENING FLUSH—WEEDS—AUDITING OF COOLIES' ACCOUNTS—MUHAMMADAN FASTING—CACAO—COFFEE—TREASURE TROVE IN BADULLA—A CONTRIBUTION TO SNAKE LORE.

April 27th.

FLUSH is slackening off somewhat, and some of us are beginning to realize that there are weeds about. We have all been so busy of late securing the harvest of tea leaf, and doing our best to keep up with its rapid growth, that the weeds have had a royal time of it. We always say to ourselves that tea is not like coffee, and that being a little weedy does not matter much; but I suppose it is the effect of early training, that, however much truth there may be in the above theory, we would prefer having it tested by another fellow, he to have the dirty estates and we to have the clean. Under any circumstances April and May are trying on the weeding contractor: there is always such a rush after the first rains that the weeders fall behind and if a loss is made—although I do not believe a weeding contractor ever lost money in Ceylon, though his coolies may—this loss is never forgotten, and you may hear of it at any time. If you express any doubts on the ruinous results of the weeding, you are indignantly invited to examine the accounts for yourself, which accounts happily are never produced. Who could possibly audit cooly accounts? There is no kind of arithmetic in the world that would help an unfortunate auditor, or lead to any thing stable. I had a kangani once who kept a checkroll of his gang on the back of the door of his line. When things were working smoothly the results agreed to a cent with the estate checkroll; but when there was any row on, the discrepancies were appalling. In the latter case I found that even allowing thirty-six working days in the month would hardly bring to us within hailable distance, so we each stuck to our figures and agreed to differ.

The Muhammadans have, I understand, a Fast on at present. I was enquiring of my Malay conductor if he was observing it, as he did not seem to be quite so spry as usual. He replied that he had very hard work and required to be fed, but he was *making his wife keep it.* This sort of thing will not last long, I fear, now that Western ideas of woman's rights are beginning to permeate Ceylon.

The CACAO is looking as if it intended to do well this year again. It is healthy, vigorous, and many trees are just full of blossom. There is always a kind of straggling crop too, which has to be gathered all the year round, but this season it would seem to be more than usual, and bigger than usual. The borer is beginning to come about a little.

COFFEE—what there is hereabouts is looking as if it would do some good. What was in good heart has had a tolerable blossom which has set fairly well. But the bug is about, and what that may lead to remains to be seen. The possibilities with bug around are all against the planter.

The showery weather has ruined the chances for any more blossom, and some fine coffee which I saw in Dimbula did not seem as if it would overbear this season. It is to Haputale one has to go to see coffee crops, and there there are certainly some very fine ones. All the same even in that favoured district, the shrinkage of coffee area goes on, and the new favourite,—TEA—is taking its place. Still with the late splendid prices, coffee is receiving renewed attention, and tea is not being planted up quite so freely as it was a little while ago. Few that I know of are planting coffee. I frequently see a little coffee clearing—plants grown from Coorg seed—which is not without hope. The nursery was badly stricken with leaf-disease, and in the N.-E. of last year the plants were put out with hardly a leaf on them, and very thin otherwise. It was "a sair sicht" for some time, but the plants have worked round, and now they have a good deal of vigour in them, and promise well. Of course, between the cup and the lip there may be a good many slips yet.

It is quite remarkable the number of places in Ceylon where TREASURE is said to be buried, and perhaps more remarkable how few attempt to find it. Still now and again a man turns up willing to risk good coin in a hunt after the hidden. At present a search is being made on the hills around Badulla for some treasure said to have been buried by the Sinhalese and the enterprising person who has faith in the tradition was burning a lot of dynamite, and keeping the place lively with the booming of his explosions when I visited the capital of Uva a few days ago. Saturday and Sunday were all alike, and the vigour of the would-be discoverer, was undoubted. A silver lamp was said to have been found in the neighbourhood ever so many years ago, and, as far as I could learn, the interest in the present effort had been increased by the unearthing of some ashes and pieces of broken chatties, which of course was something. When a man goes in for speculation there are always chances against him, but of all lotteries that of treasure-trove seems to have the maximum of blanks.

As contribution to SNAKE-LORE I offer the following which my horsekeeper maintains is the only way to cure the bite of the green snake. The green snake, he says, always bites people in the eye, and when it does so the unfortunate falls down as if dead. The snake then escapes up a tree, and it is very essential to notice the particular tree it has ascended. This having been found, a funeral pyre must be built up close to the tree and the snake's victim carried out as if for cremation; then the pyre must be lighted, and when the snake sees this, it will conclude that the unfortunate has been done to death. It will then vomit out its poison, and the person bitten will at once revive. All this is so very simple, and effective that I did not care to keep such valuable information altogether to myself. Perhaps if no treasure is found at Badulla, and time allows, the worth of this veracious statement might be tested.

PEPPERCORN.

MR. RIDLEY, of the Gardens and Forest Department, has issued today the first number of the "Agricultural Bulletin of the Malay Peninsula" which it is proposed to publish from time to time as occasion may serve. These Bulletins will treat of subjects connected with Agriculture and Horticulture in the Malay Peninsula. Mr. Ridley in his "fore-words" says:—

It is hoped that planters will send to the Director of the Botanic Gardens, Singapore, notes and observations on the cultivations of the various crops under their care. Observations on insect and fungus-pests are especially requested, and these should always be accompanied by specimens of the injurious insect or fungi either alive, or preserved in spirits, except in the case of butterflies and moths which should be sent dry in envelopes.

The first Bulletin contains an abstract of a series of interesting articles written by Dr. Burck, Assistant Director of the Botanical Gardens at Buitenzorg, dealing with his method of treatment of coffee-leaf disease in Java.—*S. F. Press.*

EXTRACT OF TEA.

In a recent invention the tea to be extracted is placed in a digester of conical form provided with a movablo perforated false bottom, and communicating by means of a siphon-tube, with another vessel used as a boiler and placed at a lower level. A supplementary boiler is also added at a higher level from which water is run into the digester. In order to insure the better extraction of tbo tea leaves, the digester is provided with a rod sliding through a stuffing-box and provided with spokes, and through thelid of the digester a cohobating apparatus is passed connected with small chambers charged with wool, which serve to condense tbe aroma. The tea is introdnced into the digester, and hot water is run in from the higher boiler, and a current of steam from the lower boiler. When the extraction is complete, the latter is shut off, and the infusion suoked into the lower boiler, from whence it is run into an evaporator. The liquid is then concentrated until a sample taken out hardens on cooling. During the process it is best to keep the liquid in agitation. Part of the wool on which the aroma is condensed is stored up with lump sugar in a closed vessel, wheu some of the aroma is abstracted; tbe rest of the wool is placed in a mixer with sugar, and the who'e moistened with water or "aroma-water." The aromatised sugar can be expressed from the wool and stored in suitable receptacles; the wool is washed and used over again. The more or less dried tea infusion is mixed with "aromatised sugar," and the whole heated to 100 degs. in a closed vessel provided with a mechanical agitator, which is worked until it moves smoothly without resistance. After partial cooling the plastic mass is rolled, and out into convenient shapes. The extract may be used for making a "cup of tea" or for the purpose of confectionery; the spent tea-leaves from the digester are compressed and made into blocks to be disposed of as "mauure," or they may be carbonised in a closed retort to obtain tea-charcoal and tea-tar, which contains ammonia, other nitrogen compounds, acetic acid, and similar products.—*Grocer*.

SERIO-HUMOUROUS.

REVIEW OF THE INDIAN TEA TRADE.

The clerk of the Worshipful Company of Tea Tasters presents his compliments to the editor of the *Home and Colonial Mail*, and begs to enclose a copy of the Annual Review:—

REVIEW.

Tea Lane, March, 1891.

The tea season of 1890 being now sufficiently advanced to enable the Company of Tea Tasters to pronounce an accurate opinion on the crop, the master and wardens deem it advisable at once to issue the official review, in order that planters and others interested in tea cultivation may have due time for reflection, and an opportunity to pick out the golden tips before the new season opens. The season just closing has been one of unusual activity. Several estimates of tho quantity to be expected had been put before the company during the season; but the Court of Assistants received them with dignified indifference until the month of January, when it became probable that the estimated quantity would not be realised, and a very lively interest was at once displayed.

The imports and deliveries for each month have been duly published by the usual authorities, and the figure heads of the Tea Tasters' Company have regularly discussed them without materially adding to the general stock of information. It is not therefore deemed necessary to make a detailed reference to them at present, as the company does not exist for figurative purposes. It may be mentioned, however, on the authority of a past master, that the crop of 1890 has fallen short of the previous season for the first time in twenty-five years, but seeing that in the last thirty years the production of Indian tea has increased one hundred-fold, this temporary halt in the onward march is only, as the French say, *reculer pour mieux sauter*. And it may safely be predicted that planters will carefully note the wishes of the consumers in this country, and favour them with an increased quantity next season, particularly in consideration of the more remunerative equivalents now offered them, and because tea planting ought to be a *growing* industry.

The Tea Tasters' Company view with much satisfaction the gradually increasing size of the breaks of each kind; and it may safely be affirmed that some of the best prices obtained in the Mincing Lane sales during the season have been for some of the very largest breaks offered. It is also satisfactory to notice the gradual disappearance from the sale catalogues of non-sampling breaks, which in times of extreme pressure are frequently overlooked. Some members of the Tea Tasters' Company are of opinion that every further increase in the crop of Indian tea should be managed by making larger breaks of each grade rather than by increasing their number. Some, indeed, regard the regulation twelve chests as too small a quantity to draw a sample of, and draw the line at thirty chests. Others are accustomed to "look at" every sample, small break or large, but only carefully to go into the merits of the desirable ones. Planters will therefore do well to avoid the undue multiplication of breaks, as in the long run the general result is not furthered by such a course. This observation is now much more necessary than it was ten years ago. The values of the different varieties were then 4d to 6d per lb. as under, so that careful sorting had its advantages; but it would now seem to be needless spending labour and pains on making three or more grades when the difference in the market price does no exceed ½ l or 1d per lb. Frequent instances will occur to any careful reader of the weekly record in the HOME AND COLONIAL MAIL in which Pekoe has realised 10d, Pekoe Souchong 9½d and Souchong 9¼d per lb, whereas if the three grades had been assimilated in one unassorted conglomeration, it is not at all unlikely that the result might have been 9¾d. Certain it is that in the future, unless the assimilation of grades receives more attention in the direction indicated, a deadlock will result in times of pressure which may prove disastrous. It ought to be mentioned, however, that under the auspices of some prominent members of the Court of Assistants an arrangement was come to early in the season amongst the tea importers to regulate the quantity to be offered in public sale each week, so that it should not exceed 35,000 packages. It was hoped that this concerted action would prove a sort of "automatic governor and feed regulator," and it was fairly successful during the autumn. But in January when the machinery was set in motion after the holidays, a quantity of unexpected "fat" was squeezed out, which lubricated every wheel so much that the governors lost control of the machine entirely. The vent pegs got loosened and finally the sluices gave way, and the docks were nearly empty at the end of the month. It was then discovered that 170,000 packages had slipped through during that time. The engineers have since made some show of repairing the machinery, but it is to be feared that it will only work in fair weather, when there is not much need of it, and that directly self-interest prompts anyone to loosen the vent peg, it will speedily be kicked out.

The number of samples reported on by the company during the season has been at times sufficient to tax very seriously the capabilities of the livery. Frequently the obscurity of the atmosphere has been an added difficulty which it was not easy to see the way out of. Grateful acknowledgment is, therefore, due to Professor Hunter, who under these trying circumstances generously afforded the company the benefit of his valuable invention, the Biennial hydrogen pekoscope, a scientific discovery of the utmost brilliancy, by which the fog fiend is effectually defied, in consideration of which it is confidently believed that the proposition to confer on the professor the freedom of the company, enclosed in one of Andrew's patent metal caskets, will meet with general approval.

The quality of the bulk of the crop of 1890 has been tolerably satisfactory and, generally, saleable. There still seems to be a want of endurance about it however, and if by any new method of working the leaf planters could ensure its keeping its flavour until the consumer could get it into the teapot, it would be worth trying for; and if once the produce of certain gardens acquired the reputation of keeping its quality well, it is more than likely that the attention of buyers would fasten on them. It cannot be too frequently reiterated that tea is, in its highest sense, a "beverage" "cheering, but uninebriating" as Don Franco beautifully puts it. It follows, therefore that in so far as the beverage proves to be refreshing and cheering, just so far does it fulfil its purpose. Golden tips are, no doubt, very beautiful to look upon, and very acceptable to school-boys. Some older boys, too, like Master Watty will even spend their pocket-money very freely in buying them; to look at and talk about, but nobody at the family tea-table cares for appearances so long as he feels refreshed and cheered, and the only ten-guinea leaf for which there is likely to be a permanent demand bears the Bank of England water-mark.

A review of season 1890 would be incomplete if reference were not made to the improvements effected in quickening the delivery of tea after public sale. It has always been a gratifying feature of the business that those engaged in tea importing were thoroughly interested in their work. They were no doubt actuated by a sufficiently high sense of duty to let the public have the offer of their tea in sale. Indeed, the readiness occasionally displayed to show samples almost as soon as the ship was reported in the docks was misunderstood, and made the occasion of grumbling by those who had nothing to lose.

It was after the public sale, however, that natural feeling asserted itself in a disinclination to part with what was loved and lost, until the very last moment allowed by the unfeeling clause in the sale conditions. It was felt at last some modification was desirable. Frequent conferences were held, at which free expression of opinion took place between all those who seemed interested in the subject, and a final agreement was come to by which the importers agreed to surrender their property in three days instead of seven; thereby peacefully and satisfactorily cutting off an almost constant hot water supply.

Reference should also be made to the opening last November of the new Indian tea plunge in connection with the London Prophets Cleaning House. Several members of the Tea Tasters' Company had previously experienced the cleaning out process privately at the Stock Exchange Baths, where the accretions of oil were speedily removed and the toiler lightened of his load. It was a happy thought, therefore, to bring home to Mincing Lane the hygienic benefits of Baden Baden. The operators in China tea were the first to embrace advantages of the new process. And to their honour it must be recorded that so far from desiring to keep all the benefits to themselves, they desired quite sincerely to let in the outsiders. In November it was proposed to open the Indian saloon. A code of rules duly appeared and operations were commenced. The Tea Tasters' Company has taken no official notice of the proceedings so far, but a few of the members have engaged in the game on their own account. A daily contest is held at which some well known and honest person is voted to the Chair. The proceedings commence usually with a certain amount of fencing; indeed on some occasions nothing has been done but the shouting of challenges to one another. If, however, a challenge be given by one party to plunge in for, say four months for a certain sum, and an opponent thinks it a desirable contest, the challenge is answered, and the seconds speedily book the names and take the stakes, and both at once plunge in. Considerable interest is taken in the game, and, as the tide ebbs and flows all through the weary months, both parties watch it with the keenest eyes. Perhaps they indulge their fancy by thinking they are adding to the lustre of England's commerce. They are doing nothing of the sort. Far otherwise. They are really engaged in a game of chance, in which what one man wins the other loses, and, when at the end of the four months the experts decide that the loser shall hand over so many hundreds of pounds to the winner, both have to accept the decision or forfeit their stakes. It is, perhaps, too soon to pronounce an opinion on the effect produced by these gamesters on the legitimate market. Up to the present there have been some outsiders well cleaned, but the insiders evidently wish to study the development of operations still further. To the ordinary tea dealer the fluctations in value, caused by so many outsiders plunging in and splashing about, have caused very serious perplexity. But even in this the back will eventually adjust itself to the burden; and there, for the present, it must be left.

As to suggestions to planters for next season, the Company of Tea Tasters' cordially send their greetings to their many friends in India and elsewhere, who have in the past striven with heroic fortitude to do their best. Naturally they are much better judges of how to do their work than even the most eminent broker in the City of London. Let them continue to do their best in every respect, produce a good liquor with a fair leaf, packed in sound chests that will neither taint the tea nor allow it to deteriorate in quality, and their growing industry shall be well supported by the London market, and in due time by all the world. (Signed)

For the Worshipful Company of Tea Tasters,

H. and C. Mail. A. POOREMAN, Clerk.

BAD NEWS OF NEW SEASON'S CHINA TEAS.

The *Foochow Echo* says:—Recent information received about the picking of the new leaf, from the various tea districts, is truly lamentable, in fact it is so bad, that one is almost inclined to believe that no new teas can be expected in the market. We know that natives have the unenviable reputation of being capable of spreading false news. But, after allowing a hundred per cent of what we have been informed to be false there yet remains a very gloomy prospect for the native tea hongs here, and for the growers in the country. Of the former, we understand, that only two hongs out of ten have made some very small advances to those tea men of good standing, and these under conditions, that the costs shall not exceed those ruling last season. This no doubt is a wise step, as it will prevent the usual competition in the hills, which may be fairly assumed to have been the chief cause why teas were laid down in this market at such high costs every year. It is also further stated that a well-known and wealthy tea hong has refused *in toto*, to grant any advances; nor does this hong care to have anything to do with tea at all during the approaching season. This action has disappointed many tea men, who are now entirely without hope of obtaining any advances. From the country, we learn that owing to the establishment of a low scale of wages, much difficulty has been created in obtaining labourers, and we understand that many of these have left the tea districts in search of other work. In fact the whole business is in so unsatisfactory a state that the amount of treasure which has been sent up country does not exceed five hundred thousand dollars, (merely a drop in an ocean). That this will curtail to a great extent the gathering of, at least, the first crop leaf, cannot be doubted.—*China Mail.*

PERAK TEA.—A small consignment of Perak tea has been received in London, but has not been placed publicly on the market as yet. Some experts and others have sampled the lot, and pronounce it of good quality. It is of good colour, though slightly strong, and brews out well; it will bear comparsion with equal growth of India and Ceylon, —*Straits Independent*, 25th April.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &c.
EDITOR OF "SCIENCE GOSSIP."

Mr. E. H. Acton has recently shown that, notwithstanding the prevalent opinion to the contrary, some green plants can assimilate carbon from certain organic compounds in the absence of carbonic acid from the atmosphere. He prepared what he calls a normal "culture solution" for the purpose, and he concludes that green plants cannot normally obtain carbon for assimilation from any substances except carbo-hydrates, but that a compound may be a source of carbon to the leaves although not to the roots.

A capital and most thoroughly-practical scientific use of observation has just been made of the well-known fact that aniline dye kills all sorts of bacteria and bacilli. These dyes, are, medically speaking, quite harmless. So two German physiologists have (after various experiments with guinea pigs, rabbits, &c., all of them successful) began to treat human subjects affected by bacterial diseases with aniline. Skin ulcers and even eye diseases, wounds and sores suppurating—in short all diseases in which micro-organisms take part—are being successfully treated with this cheap and common dye, given in small diluted doses.

Perhaps the most expensive taste in the world, next to horse-racing, is the cultivation of orchids. How many rich people cultivate these flowers (which represent the tulip mania of two centuries ago) is best shown by the fact that "a new orchid journal" is announced. It is to be edited by a Viscount.

An interesting, if not important paper has just been read before the Geological Society on "The Borrowdale Plumbago, its Mode of Occurrence and Probable Origin," by Mr. J. Postlethwaite, of Keswick. Many of my Australian readers who hail from the old country will remember the famous Cumberland black lead, drawing pencils of their childhood's day. The raw material came from Borrowdale. This was in the days before the graphite now used for "blacklead pencils" had been discovered as a waste product in the manufacture of coal gas. The Borrowdale plumbago or native "blacklead" occurs in veins traversing certain kinds of igneous rocks, which themselves break through volcanic deposits. Mr. Postlethwaite showed that many thousand feet of volcanic rocks must have supervened between the Borrowdale plumbago-bearing beds and the overlying silurian shales. He thinks he has found strong similarities between the plumbago-bearing rocks in Borrowdale and the diamond bearing rocks of South Africa; and also that the conditions under which the plumbago was originally formed in one lake district approached more closely to those which gave rise to the Kimberley diamonds than to those which originated the plumbago veins in North America. His opinion is that the molten magnia, in its upward course, passed through a deeply-seated stratum of carbonaceous material, and tore off numerous fragments. The president of the Geological Society (Dr. Archibald Geikie), in the discussion which ensued, said there were only two possible sources of supply for diamonds and graphite—derivation direct or indirect from organic matter, and (as in the most ancient archæan rocks and meteorites) as an original mineral. Of course there is not! What chemist or geologist could imagine any other derivation for them.—*Australasian.*

HOW TO USE THE TOMATO.

BY MISS MARGARET RYDER.
(From *The Ladies' Treasury.*)

If the housekeeper of half a century ago could step into the modern kitchen and store-room, how extreme would be her surprise to see into what general use as an article of food the "love-apple" of her day has grown! Then it was cultivated only for ornament; now, prepared in a variety of ways, it takes its place on the table for breakfast, luncheon, and dinner.

During the hot days that come in the latter part of the summer, when beefsteak and chops have ceased to tempt the appetite, no more desirable dish can be sent to the breakfast table than broiled tomatoes. They take the place of meat, and provide a relish.

To prepare this dish, select medium-sized ripe tomatoes; wash, and cut in two. Place the pieces on a perfectly clean wire broiler, the cut side down, over a clear fire. When cooked almost through, turn, and cook until soft. Serve on a hot platter, with cut side up. Sprinkle a little salt and pepper on each piece, after pouring a teaspoonful of melted butter over them.

For lunch, a tempting salad can be made of tomatoes. Select one dozen ripe tomatoes; peel, cut in thin slices and set on the ice. Make a dressing of the yolks of four eggs boiled hard, and rubbed to a paste with a tablespoonful of salad oil; add half a teaspoonful of pepper, one of salt, one of white sugar and two of mustard. Stir in the yolk of a raw egg beaten to a froth, and, last, one teacup of vinegar. Put this on the ice to get cold, and when ready to serve, pour over the tomatoes.

This salad may be made a very ornamental dish by selecting the tomatoes of a uniform size and bright colour, cutting off a round from the stem end, removing the seeds, and filling with the dressing. When prepared in this manner a single tomato should be served to each person, on a small chin plate, resting on a bed of green.

Tomato toast is an excellent dish as well as an economical way of using inferior tomatoes. Pare, slice, and cook halfripe tomatoes until very tender; add sweet milk sufficient to make plenty of gravy; season with pepper, salt, and plenty of butter. Have the bread nicely toasted and placed in a deep dish, and pour the cooked tomatoes over it.

At dinner the tomato can be offered as soup, as a relish, or a dessert, as the cook may decide to prepare it. Either of these two recipes for soup is recommended:

Tomato Soup, No. I.—Scald and peel good ripe tomatoes; stew them one hour, and strain through a course sieve; stir in a very little wheaten flour to give it body, and brown sugar in the proportion of a teaspoonful to a quart of soup; then boil five minutes.

FAST TRAVELLING.

The following is the record of the fastest mile a single man has thus far travelled by various methods of locomotion.—Swimming, 26.32; walking 6.23; snow shoes, 5.39¾; rowing, 5.01; running, 4.12½; tricycle, 2 49 2-5; bicycle, 2.29 4-5; skating, 2.12 3-5; trotting horse, 2.08¾; running horse, 1.39¾; railroad train, 40¼ seconds.—*S. F. Press*, April 22nd.

HARNESS DRESSING.—The following is recommended as the best dressing for harness, a few applications will prevent it becoming dried up in this hot climate:—

Pure rubber	..	..	1 ounce
Benzine	..	..	18 ounces
Tallow or oil	..	..	2 lb.

Dissolve the rubber in the benzine, then add the oil. The benzine carries the rubber into the pores of the leather, preventing it ever becoming hard.—*Mildura Cultivation.*

THAT WONDERFUL CEYLON TEA which is described as having caused such excitement in Mincing Lane could be equalled, says a Darjeeling correspondent, anywhere in the Indian tea districts. Probably about half a maund of it per acre could be turned out for a season before the concern went into liquidation. "I have seen similar samples of tea turned out here, simply and solely for exhibition purposes, and have a small bottle of it by me as I write. The manager in India who tried this sort of thing on an extensive scale would very soon be obliged to join the unemployed list, and to remain on it."—*M. Mail*, April 28th.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, April 9th.

CARDAMOMS.—The following figures refer to the shipments of cardamoms from Ceylon in the period between January 1st and March 16th:—1891, 71,437 lb.; 1890, 96,333 lb.; 1889, 48,572 lb.; 1888, 83,038 lb.

CINCHONA.—Tuesday's bark sales were moderate in extent and consisted almost wholly, so far as saleable barks are concerned, of Indian-grown cinchona. Not only red, but also grey and yellow barks were well represented. The catalogues were composed of the following assortment:—

	Packages		Packages	
Ceylon bark ...	208	of which	154	were sold
East Indian bark ...	1,605	do	1,521	do
South American bark	646	do	114	do
Total ...	2,459	do	1,789	do

No Java barks were offered. A dull tone prevailed throughout the auctions, and prices declined about 10 per cent, as compared with the previous London auctions, thus falling to about par with the last Amsterdam sales. The unit ranged from ¾d to 1d per lb., the latter limit being scarcely exceeded even for the best grades of bark. The following are the approximate quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick factory ...	143,541
" Mannheim and Amsterdam factories	75,799
" American and Italian factories ...	47,610
" French works	38,120
" Stuttgart and Frankfort o/M works	37,936
Messrs. Howard & Sons	25,640
Agents for the Auerbach factory	23,060
Mr. Thomas Whiffen	17,670
Sundry druggists	15,430
Total quantity sold	424,806
Bought in or withdrawn	83,956
Total quantity offered	508,762

The following report is given of the result of the last Amsterdam auctions so far as pharmaceutical bark is concerned:—The assortment, which was exceedingly large, was a fairly good one of all grades. There were several parcels from private plantations of exceptionally good appearance and carefully dried; first quality long quill from the Government plantations realised 81 to 125 cents; short quill 60 to 64 cents; second quality was not offered; broken quill and coarse chips, 11 bales of medium quality sold at 11 cents per half kilo. A few parcels of the barks grown on private plantations sold as follows:—Succirubra: Grey without moss, long quill 40 to 52 cents; short ditto 34 to 47 cents; smooth brown long quill 25 to 40 cents; short ditto 20 to 35 cents; broken quill, no dust 25 cents. Lancifolia: Handsome long quills 59 to 61 cents; short ones 46 cents. Calisaya: Schuhkraft, long thin quill 29 to 30 cents; Calisaya, one parcel of badly-dried thin quill went cheaply at 8 to 10 cents—the supply of this quality much exceeded the demand, and 343 cases were bought in; a few parcels were badly cured, and consequently had a musty smell, and the planters are particularly cautioned against any carelessness in the drying of their bark The quill of thin bark should not be rolled so as to obtain the appearance of stout quill. If carefully and regularly rolled and of good appearance, thin small quill is always in demand, but the section of it should show an incomplete circle, and not a spiral form, such as is obtained by rolling it round several times.

At the Amsterdam bark auctions on Thursday of last week, out of 7,401 packages offered for sale, 6,200 were sold, at an average price of 5¾c per unit (equal to 1d per lb.) The prices paid for manufacturers' bark varied from 3c to 58c; ditto root, from 9c to 49c. Druggists' bark, chips and quills, obtained 7c to 126c; root 9c to 12c. 3,604 kilos sulphate of quinine contained in the bark were sold at 5c per unit; 5,916 kilos at 5½c per unit; 5,666 kilos at 6c per unit; 2,197 kilos at 6½c per unit; 582 kilos at 7c per unit, according to published analyses. The chief buyers were the Brunswick Works, the Auerbach Works, Messrs. Matthes & Bormeester (Amsterdam), C. L. Schepp & Zonen (Rotterdam), and Gust. Briegleb (Amsterdam) On the day following the sale, most of the bought-in manufacturing barks were sold, but the prices have remained secret.

COCA LEAVES.—Thirty-five packages Java leaves sold by auction at Amsterdam on Thursday last at the following prices:—Crushed leaf, 35 to 51 cents (equal to 6¼d to 9¼d per lb.); rolled leaf, 30 cents (equal to 5½d per lb.)

COCOA BUTTER.—The monthly auctions which took place here on Tuesday resulted in a decline. 500 2-cwt. cases of Cadbury's brand selling at 1s to 1s 0½d per lb.

TEA IN GERMANY.

Those of our readers who have noticed the recent articles in this journal on "Tea in France" and "Tea in Paris" (where such vigorous efforts are being made to popularise our vaunted English beverage among the eminently sociable and bibulous French, will perhaps be interested to learn that, in its turn, the big neighbour of France across the Rhine is now to be subjected to a similar peaceful invasion.

The Indian tea planter is on the war-path; Australia, America, Belgium, France—each has been attacked within the last few years; and still, like Lars Porsena,

> East and west, and south and north,
> He bids his messengers ride forth;
> And none shall say him nay.

A movement has lately been set on foot under the auspices of the Indian Tea Association of Calcutta for the introduction into Germany of pure Indian tea, as such, and this by means of an organised packet trade.

The tea, which consists of three specially selected blends, is put up in attractive little packets of ¼ lb., ½ lb., and 1 lb. (German weight), the labels of which set forth in two languages the virtues of the contents, and bear, moreover, clearly printed on each, careful instructions for tea making, together with net weights and retailing prices. The latter, we believe, have been fixed at 4, 5, and 6 marks per ½ kilo, which, in Germany, where 6 marks is quite a common price for quite a common tea, should prove an attraction in itself.

The services of a Hamburg firm have been secured as a sort of general agency or distributing centre for the German Empire, and we understand that a contract has been entered into for a term of years, which includes several valuable provisions. Among these are one by which the agent agrees to purchase a fixed minimum—and yet not a very small—quantity of the tea in each year; and by another, to establish at least one depot for the sale of the new article in every town of over 20,000 inhabitants, and not less than twenty such depots within the first year.

We are only sorry not to observe any arrangement for the opening of tea rooms or other places for the practical conversion of the Teuton from the "bier-seidel" to the tea cup; but doubtless this important point has not been overlooked, and it will be merely a question of time and—time's twin—money.

Possibly their recent experience of the rather costly amusements with "Palais Indiens" and the like in Paris, has a little damped the ardour of the dauntless Indian tea zealots; or haply they are but pausing for a moment to reflect upon the excellent Italian maxim, "Chi va piano, va sano." However this be, we are persuaded that in Germany the enterprising planter has before him one of the most promising fields in Europe, and if he be wise in his generation he will look to it that this new movement in search of tea consumers do not languish for lack of his energetic support.

Already we hear rumours of German Governmental patronage for the enterprise, probably on temperance grounds. Great is the faith of the Teuton in the magic of official favours, and recognition of the undertaking by those having authority should in his country go far towards ensuring success.

Certainly there is much room for the extension of tea consumption in Germany. Let us glance at the figures of the question.

With a population of over 48,000,000 the Fatherland now consumes only some 4,500,000 lb. of tea per annum, or say 0·09 lb. per head, while its prosperous little neighbour, Holland with little over 4,000,000 inhabitants, takes nearly 6,000,000 lb. annually, or say 1·5 lb per head.

It follows that, could we persuade the usually not unthirsty German to absorb even one-half as much of our fragrant beverage as the apparently still more thirsty Dutchman, the tea trade of Germany would at once be increased seven or eightfold—say to 30,000,000 lb. per

annum. Already the consumption in that country has grown to be more than three times greater than that of France, and those best qualified to judge assert that there is no real reason why, with a little pushing, the German tea consumption should not be brought up to at least one pound per head within a moderate period.

In a recent letter on this subject, the secretary of the Indian Tea Districts' Association writes:—

"The annual tea consumption per head of population in Germany is about 41 grammes, against only 14 grammes in France—the population being about 48,000,000 against 36,000,000 so that the quantity of tea consumed is already as four to one. In Holland the consumption is over 600 grammes per head per annum, or fifteen times greater than in Germany. If therefore the German rate of consumption could be raised to that of the Netherlands, the present German consumption of about 4,500,000 lb. would be converted into 65,000,000lb. to 700,000,000lb."

Here, then, is evidently good work to be done for Indian tea. The Germans are eminently a teachable people. They are highly intelligent, and new ideas, if sound, find with them a sure, if not an over hasty acceptance. They also now travel much; they visit many lands, and sojourn with many peoples. Returning, as thousands of them do, to end their days in the Fatherland, they introduce many fresh views of life and manners, and as it is for the most part with one or other branch of our own race that the traveller in his search of fortune has been in contact, it is not surprising to find that in Germany the word "foreign" is rapidly becoming a mere synonym for the word "English." Add to this that by far the greater number of visitors to Germany every year are English and Americans, while the influence of things French is dwindling to a minimum, and we see that any changes that may or do come in German national habits must necessarily be in the direction of anglicisation.

Now tea drinking is far too prominent a social custom of all branches of the Anglo-Saxon race to be easily overlooked, and nothing is more noticeable to the English traveller than the improvement of late years in the provision made to meet his requirements in this respect. The request for a dish of tea at an hotel no longer produces, first a blank look then a mild commotion, and finally a lukewarm pot of gingerbeer-coloured liquid, tasting more like the straw in packing-cases than like anything else in heaven or earth. All that is a thing of the past, at least in the better hotels and restaurants—but the quality of the leaf—generally a common China Congou with a peculiar Continental "twang" of its own, still leaves much to be desired. The ordinary price, too, of tea in Germany, when the duty is after all only 6d a lb., makes it still practically the luxury of the well-to-do, who are now compelled to pay from 4 to 9 marks a lb. for a range of teas for the most part much inferior to those sold in England at from 1s 6d to 3s.

It seems clear then, that there is here a most promising opening for his ever-increasing product, which the Indian planter would do well to secure for his own.

Just at present that usually energetic personage is —perhaps naturally—inclined to be somewhat apathetic as he glances contentedly at a comforting fourteen penny average, and indulges doubtless in happy day dreams of an increasingly thirsty forty millions of Britons who will continue *ad infinitum* to absorb greedily all the numberless thousands of tea chests he can empty into the aching void of their tea-pots!

But what if China awakes to the situation? or Ceylon doubles her present out-turn? What is to happen when the whirligig of time brings round another "depression of trade," with its instant and inevitable effect upon the consumption of all articles, and especially of things liquid? That all of these cases are possibilities we think none would deny, and therefore those who have the interests of Indian tea really at heart would in our opinion do well to lose no opportunity of creating new outlets in order to provide against a not good, but possibly bad, time coming.—*H. & C Mail.*

A REMEDY FOR POTATO DISEASE.

Since the article on the prevention of potato disease by the use of sulphate of copper appeared in *The Times*, on Monday of last week, a report of similar experiments by M. Petermann, Directeur de la Station Agronomique de l'Etat á Gembloux Belgium), has come to hand. M. Petermann, like M. Girard in France, made tests with sulphate of copper, but he also tried another remedy—viz., sulphate of iron. His experiments showed that the sulphate of copper dressing was effective, and, whilst it did not injuriously affect the weight of the crop, or the richness of the root in fecula, it most certainly reduced the percentage of unsound or diseased potatoes. M. Petermann used a stronger dressing than M. Girard, his formula being (per hectare), sulphate of copper, 50 kilog.; lime, 25 kilog.; and water, 25 hectolitres. The test showed diseased roots amounting to only 7 per cent. on the total quantity raised, as against 30 per cent. of unsound tubers where the dressing was not used. The treatment with iron is very favourably spoken of, as it resulted in the diseased potatoes being lessened in quantity by 12 per cent. The iron mixture is composed as under:—Sulphate of iron, 50 kilog.; lime, 25 kilog., and water, 25 hectolitres per hectare. It is simply the substitution of iron for the copper, and the cost of treatment, M. Petermann says, s consequently much less. He regards the experiments as of vast importance, and contemplates further inquiry into the subject.

EXPORTS OF TEA.

The large shipments of tea last month from Colombo deserve a special word of comment. It will be observed that the total for April was equal to 7,056,163 lb., and for the four months—January-April—the aggregate of shipments is no less than 21,969,246 lb.! Now if this were an ordinary year, such figures would point to a total export for the year of not less than 66,000,000 lb., for the percentage of our annual shipments sent away in the first quarter or third of the year is by no means so large, usually, as in the other two-thirds. But it is well-known that since December, the season has been an extraordinarily favourable one for flushing. Considering, however, how busy our planters are on all sides, we feel fully certain that for the year, the 60 millions lb. will be exceeded in the total shipments. The estimate of the Indian Tea crop of 1891 given elsewhere is 116,000,000 of which perhaps 109 millions may go to the United Kingdom, against a total for Ceylon of 61 millions of which 57 millions may go to London.

INDIAN IRRIGATION.—The Hon'ble Alfred Deakin, the Victorian ex-Minister, who was the first to carry out practically the suggestion of Bishop Moorhouse to "conserve the waterfall rather than pray for rain" by instituting irrigation works under Messrs. Chaffey Brothers, has returned from his visit to India, whither he proceeded specially to study the system of Indian irrigation. On his return Mr. Deakin observed to a Press interviewer: "Indian irrigation is on by far the largest scale and by far the best of any in the world. As far as engineering work is concerned, it far exceeds anything else I have seen in Egypt, Italy, or America. The white people in the country don't know it. I was the first white man in the country, who was not an official, who went up the Sirhind Canal."—*Indian Engineer*, April 25th.

PLANTING AND PROGRESS IN JAMAICA.

During the months that have elapsed since our last meeting I have again visited several parishes and everywhere I have found evidences of awakened energy, of hopeful effort in the present, and of confidence in the future. The Island shows signs of a rapid recovery from the depression of the period immediately preceding the year 1889. There is a large increase in the value of real property; the fruit trade is expanding with extraordinary rapidity, and with the daily improving means of communication will still further expand.

The acreage under sugar canes has decreased, but the decrease is more than counterbalanced by the increased acreage devoted to the cultivation of bananas, coffee, cocoa, tobacco and ground provisions.

The improvement in the dwellings of the people is a fair test of their prosperity, and I find that the number of houses paying rates at an assessed value, increased during the year ending 30th September, 1890, by 24 per cent.

The Selection has been made of the Roads to be taken over by the Director of Public Works under the Parochial Roads Law of 1890, and as the selected roads are being transferred to the Public Works Department as quickly as circumstances will permit, I hope that the end of the present year will see over 960 miles added to the 800 miles already included in the Main Road system.

The first section of twelve and a half miles of railway extension has been made and opened for traffic; and telegraph extensions have been carried out from Half-way-Tree to Annotto Bay; from Brown's Town through Barnstaple to Ulster Spring; from Shooter's Hill to Balaclava, and from Santa Cruz to Malvern, while to facilitate the timely signalling of vessels telephonic communication has been established between Morant Point Light House and Plantain Garden River Telegraph Stations.

The Exhibition was opened by His Royal Highness Prince George of Wales on the 27th of January, on the day and at the hour decided upon in October 1889.

It would be difficult to over-estimate the importance of the Exhibition to Jamaica. Carried out as this great work has been by the hearty co-operation of every class of the community it has demonstrated how much can be done when all work together for the common good; it has stimulated intellectual activity among the people, and has brought Jamaica with her possibilities and attractions before the world with a prominence unequalled during the present century. The consequence is to be seen in the keen competition for her trade, and there are already indications that the close of the Exhibition will find the Island endowed with more than one valuable industry, hitherto undeveloped, while markets will be found for products till now neglected. Nor will the benefit be confined to Jamaica for the products of the Bahamas, Barbados, Grenada, St. Vincent, and Turks Islands are exhibited in their respective Courts and are being noted by observant eyes. The number registered as having visited the Exhibition up to the present is 78,303, and I have no doubt that before its close a very large proportion of the people of Jamaica will have availed themselves of the opportunity of improvement and advancement afforded by it.

Two subjects have occupied my earnest attention—the introduction of new products, and the adoption of some practical means of industrial training.

The question of Industrial Training for the young people of the Colony is of primary importance; while I yield to no man in my appreciation of the benefits of Education, I am by no means satisfied that a literary education to the exclusion of Industrial Training is an unmixed blessing to the inhabitants of this Island. I have granted a License to the Girls' Industrial School at Alpha Cottage. The Industrial School at Hope has been built, and is now occupied by twenty boys. The work of building the Industrial Girls School in connection with the Government Training College for Female Teachers at Shortwood will be undertaken without delay, and I hope that during the present year that School will also be in operation. I am sensible how little can be accomplished by these three Schools to supply the want of technical training, and I am conscious that the Industrial School system, as at present established, will not reach the children of respectable cultivators who form the class to whom technical education is of especial importance, I shall ask you to place at my disposal a sum sufficient to enable me to try the experiment of sending competent instructors to certain districts, whose teaching may so improve the cultivation and preparation of certain of our products as to largely increase the value of our Exports.

A CHEAP SUBSTITUTE FOR TODDY.

The gentle native who, according to Mr. Caine, has been taught by the Englishman to love strong drink, has also apparently taken lessons in the art of dodging the attempts made to check his propensity in this direction. Mr. Subba Row Punt recently brought to the notice of the Abkari Commissioner the manufacture and sale by some people in Tondiarpettah of an intoxicating spirit which was being largely used by the lower classes, especially the boatmen.

The Abkari Sub-Inspector of the locality was asked to obtain samples and all particulars regarding the preparation. From Mr. Lowe's report it appears that the intoxicant is called *sonti soru* and that it is prepared and sold clandestinely in the locality and has greatly displaced toddy, as its intoxicating properties are much greater than those of the former while it is much cheaper, half an anna worth of *sonti soru* being equal to three annas worth of toddy. It is prepared from rice, which is boiled and spread on a mat, and, when cooled, a substance called *shoudu* is powdered and sprinkled on it; both are then gently and well mixed together with the bare hands, over which gingelly oil is well smeared. The mixed mass is then put into pots, the mouths of which are tied over with cloth. The pots are then allowed to stand for three days. On the fourth morning water is boiled and allowed to cool, and a quantity is poured into each pot. The mouths of the pots are again tied up with a cloth and kept till the evening, when the liquor is fit for consumption and sale. *Shoudu* is believed to be a gum which exudes from some plants which grow in Moulmein, from which place it is obtained. The liquor cannot be kept long, as it undergoes very rapid fermentation and decomposition. The Chemical Examiner on analysing the liquor found it to be a fermenting rice liquor containing alcohol, and a mixed sample contained 5·39 per cent. of absolute alcohol by volume. The preparation is, therefore, an intoxicating liquor of nearly the same strength as ordinary beer. Steps are being taken to bring this liquor under the Abkari laws.—*Madras Times.*

JAPANESE ENTERPRISE.—The idea of "going down to the sea in ships" is evidently beginning to exercise upon the minds of the Japanese a charm such as it exercised in the days when their corsairs swept the neighbouring waters, and harried the unhappy shore-dwellers of China. The latest phase of the impulse is closely associated with the names of Viscount Yenomoto and Mr. Arai Ikunosuke. A large association has been formed, having for its object the exploration of the seas south of the Bonin Islands, with the hope of finding some fertile spot invitating colonization, or some new market for Japanese goods. We do not possess sufficiently accurate information about the plans of the company—if, indeed, a company has been formed—to speak in detail of its proceedings, but rumour says that a large number of naval officers on the retired list, or who have resigned their posts, are associated with the scheme, and that a sailing ship will soon be equipped and despatched to the districts southward of Ogasawarajima.—*Japan Weekly Mail.*

THE TALE [TAIL ?] OF A FISHING CAT.—The remarks of the Rev. Dr. Stewart, (how "Dr. Macpherson" came to be interpolated is a puzzle,) on Mr. Godfrey J. Macleod's letter on cats, (see *Literary Register*, extract from *Inverness Courier*) are interesting and erudite as the "Nether Lochaber" contributions to the *Courier* as first and so long conducted by Carruthers and now by Barron,* have been for the past forty years or so. As a contribution to the curious points in natural history discussed,—the strong aversion of the cat to water and how the animal's *penchant* for fish sometimes overcomes this aversion, I may recall a case from my reading. It is that of a cat which, in order to secure a dainty dish in the shape of shrimps, regularly fished for them. She placed her tail in the waters of a mill-dam and when it was pretty well covered with crustaceans, bent on devouring it, whisked them out on the grass and ate them at her leisure. A. M. F.

THE "KITTUL" PALM OF CEYLON, so valuable to the natives of the South-Western and Central portions of the island, from the richness of the juice of its flower spathes in sugar, we have always regarded as not only curious but remarkably handsome in its scolloped foliage. The American publication "Garden and Forest," dealing with palms for conservatories, has the following passage:—

Some of the "Fish-tail Palms" or Caryotas are very useful and highly ornamental as small and medium-sized plants, though they rapidly attain such proportions, when under suitable treatment, that they are not suited for all collections. Of the Caryotas the most common and easiest to procure are *C. urens* and *C. sobolifera*, both of which are good and also easy to manage, as they germinate from seed readily and in a short time and make rapid growth.

Caryota urens throws up its handsome leaves on strong stems, and in a large plant they sometimes reach a length of twelve feet or more. The leaves are bipinnate, which is an unusual characteristic among Palms, and the pinnules are more or less wedge-shaped being from six to eight inches in length and about half that measurement in width. The ends of the pinnules are erose, this giving them an odd appearance and readily suggesting the common appellation of "Fish-tail Palm," while the color of the leaf is dark green. Another peculiarity of *C. urens* is the manner in which it flowers, though this process does not begin until the plant has attained its full size. It begins to flower from the centre of the top of the stem, after which the flower-spikes are produced in succession downward nearly to the base of the trunk until the vitality of the plant is exhausted. The seeds are somewhat larger than a Bush Bean, dark brown in color and quite hard, this description applying to the seed proper after the outer fleshy rind has been removed. *C. sobolifera* is also a fine plant, and is more dwarf in growth than the preceding. It also has bipinnate leaves, which are bright green in color, and as it throws up suckers at the base of the plant it naturally has a more bushy habit than *C. urens*. Other good representatives of this genus are *C. furfuracea* and *C. Rumphiana*, both of which are good decorative Palms. *Acanthorrhiza stauracantha*, sometimes known as *Chamærops stauracantha*, is another fine Palm which will succeed in a moderate temperature. It has palmate leaves, deeply divided and dark green above while the under side is covered with a silvery tomentum. A distinguishing feature of this plant is the mass of root-like spines which surround its base, and from which its generic name is derived. It is a native of Mexico, and though not yet very common, has been in cultivation for many years.

* I was once in negociation with this gentleman for employment in connection with the *Ceylon Observer*, which was terminated by my good friend Dr. Carruthers wisely making it better worth Mr. Barron's while to remain in connection with the paper of which he is now editor.

GOLD MINE IN JAPAN.—The *Mimpo* says that gold has been discovered at Naganoyama, of Kotomomura, in Iwate Prefecture. The vein is said to be about four miles in length, and an analysis of the ore gives 0·4 per cent. of pure gold. Permission to work the mine has been applied for. If this story be true, a deposit of very exceptional value has been found. An analysis in the laboratory would, of course, give a greater percentage of gold than the quantity obtainable by ordinary mining machinery. But a yield of a quarter of an ounce per ton—or one part in every one hundred and forty thousand, approximately—is considered sufficient now-a-days to justify the working of a gold mine, and, compared with this, four parts, or even one part, in a thousand is something altogether out of the common. It will be interesting to learn some further particulars about the Iwate vein, if, indeed, it has any existence in fact.—*Japan Weekly Mail.*

HOW THE CURRENT PRICE OF SILVER IS FIXED.—*Bradstreet's* devotes an article in a recent issue to a description of the mechanism by which the trade in silver bullion is conducted, and the price of silver fixed, especially in the United States. The bulk of American silver comes from a number of large smelting works, some of which are associated with the mines. The usual practice, however, is to purchase the ore on an assay value. After smelting, the bullion comes out usually in large oblong slabs, with an average weight of 1,000 oz., which are known as commercial bars. A silver market *per se* does not exist. Over 90 per cent. of the silver produced in the country passes through the hands of a few banks and firms, which make it their special business, in New York and San Francisco. In fact, three or four houses monopolise the greater part of the trade, and to them the silver is consigned for sale by the mining and smelting companies. They dispose of it in the market to the Government (whose purchases under the late silver law are now of great importance), ship it abroad, or buy it themselves. The stock is believed never to be very large, and even during the recent silver agitation was not much more than from 6,000,000 to 7,000,000 oz. Bars weighing 1,000 oz. on the average, are usually ·999 fine, and all transactions in them are on this basis, which is the standard of the United States coinage. A number of bars go to the Assay Office to be converted into assay bars, which are thin bricks of silver weighing 200 oz. each, and bearing the official stamp of weight and fineness. These are in demand by silversmiths on account of the guarantee of the stamp. The bullion shipped to Europe is in the form of commercial bars, which are simply carted to the steamer and there placed, unpacked, in the treasure-room. It is quite unusual to pack silver with the care that is bestowed on gold. The bars also form the bulk of the stock held in New York. The price of silver in the market represents the price at which it can actually be sold for export or commercial purposes, and is the selling quotation of the leading bullion dealers. Until recently the New York price was fixed with relation to the price in London, which is fixed by a few houses and banks specially conversant with the business, having regard to rates of Indian exchange and the demand from other countries. But lately speculation in silver bullion certificates in New York has caused silver there to have a special and speculative price which is to some extent independent of the London market. The English standard of fineness is ·925, so that American prices represent an allowance for this difference of ·075 in fineness, as well as for the rate of exchange, which may vary from day to day.—*O. Mail*, April 3rd.

TEA CONSUMPTION RECKONED BY YIELD OF LIQUOR AS WELL AS QUANTITY OF DRY LEAF CONSUMED.

The coloured diagrams which Messrs. Gow, Wilson & Stanton annually prepare, reveal, in a graphic and striking form, to the eye, the increasing use, so gratifying to lovers of temperance and of humanity, of the "cups which cheer but not inebriate." Progress is chiefly perceptible amongst communities of the Anglo Saxon race, limited in the United States of America, however, by the truly enormous use in that country of the allied beverage,—coffee, which is so easily and cheaply obtained from the neighbouring republic of Brazil. Next to the Anglo-Saxons,—in "the mother country," in the United States, in the Australian Colonies, Canada and South Africa, come the Sclaves of Russia, for the Germans and Hollanders are even greater consumers of coffee than the Americans, although Holland, possessing as she does a tea-growing colony, in Java, is taking to tea after an encouraging fashion. A good deal of cacao or "cocoa" too is consumed in France, Germany, Italy and other continental countries. The effect of the efforts now being made to create a taste in the United States for really good *unburnt* tea, remains to be seen. As matters stand, the United Kingdom, with little more than half the population, consumes nearly 2½ times as much tea as the mixed people (so largely Teutonic), in the United States.

In Britain the increase in the consumption of tea has been marvellous. The figures in pounds for 1890 were 194 millions, so that at the recent rate of increase all the probabilities are that 1891 will show the round 200 millions, if even that enormous quantity is not exceeded. In the quarter of a century between 1866 and 1890, the consumption per head of the population rose from 3·42 lb. to 5·07. But, as in the latter half of the period strong Indian tea, reinforced appreciably by the similar Ceylon product in the closing years of the period, has largely displaced the weaker China leaf, Messrs. Gow, Wilson & Stanton have shewn simultaneously the progress of consumption reckoned by the gallons of liquid yielded. This is calculated on the moderate estimate formed in a report to the Board of Customs to the effect that if 1 lb. of Chinese tea produces 5 gallons of a certain depth of colour and fulness of flavour, 1 lb. of Indian tea will produce 7½ gallons of a similar beverage. Allowing for an apparent arrest of the advancing consumption when the process of displacement was only commencing, the increase in the consumption of tea by the people of the British Isles has been not only steady but rapid, thus:—from 17·38 gallons per caput in 1866, to 24·39 in 1876; 29·28 in 1886, culminating in 33·40 in 1890. The figure for the last year of the series is almost exactly double that of the first, so that, in consequence of the introduction of the stronger product of British growth, the people of Britain have been able to double their consumption of the beverage, although the percentage of increase in the use of the dry leaf has been only from 3·42 lb. to 5·07, an absolute increase of 1·65, while the percentage is not 50 but 48·24. This is a result more gratifying to consumers than producers, and clear it is that we must not rely on the British market alone and must not relax our efforts to open up new markets by creating a taste for our teas, which so largely combine the strength of the Indian product with the delicacy of that from "far Cathay."

Ceylon tea, which a decade ago, was only beginning to intrude itself as a new and suspiciously regarded competitor with products so well-known and established as the teas of China and India, has recently made such rapid progress, that its position in the British Market in 1890, rated by home consumption was such an excellent third as is here shewn:

Indian	52	per cent.
China	30	,, ,,
Ceylon	18	,, ,,

Looking at the process which has recently altered so materially the position of the various products, it requires no prophet to foretell that in a few years hence Ceylon will have distanced China and will be pressing hard on India with its half century of tea cultivation against our really not much more than a decade devoted to the enterprise. In round numbers the consumption of tea in the principal countries importing the leaf has increased from 350 millions of pounds in 1880 to 400 millions in 1890. We may, perhaps, add for the minor consuming countries another 60 millions, in which case we get the figure 460,000 millions. Tea consumption in India and Ceylon is scarcely worth computing, and we believe that the consumption in China has been greatly exaggerated. For, although the Chinese constantly drink tea, much of the liquor is little different from hot water. We cannot help feeling that to credit China and its feudatories with another 500 millions of pounds, is an extravagant estimate. But supposing it near the mark we may take in round numbers 1,000 millions of pounds, or say 6,000 millions of gallons as the world's consumption of tea. If peace can be preserved and wealth and civilization advance, we may confidently anticipate a great increase during the closing years of this century and the whole of the twentieth century,—for large portions of mankind are discovering that alcohol, with its "borrowed fire" is a deceiver and a curse. If the civilization of a community can be tested by the quantity of sulphuric acid it uses, much more certainly can the moral status of a community be judged by a comparison of the quantities of non-alcoholic and alcoholic stimulants it uses. Our Australian cousins are super-eminently a tea-drinking people, and since 1880, when Ceylon equally with Indian tea was furiously denounced as an injurious fraud, the Australians equally with their friends at "home" have learned the superiority of our pure teas to the inferior products obtained from Foochow. So with the Canadians, and there is every hope that ere long the United States of America, the great Russian Empire, and many of the great continental States will be amongst our best customers for teas, which they will discover to be equal in delicacy of flavour, while much stronger than the China leaf, to which many of them still traditionally cling. Of the wretched Latin and mixed races, of the South American republics, with their unpatriotic factiousness and constantly recurring internecine strife, we have about as little hope as of the regeneration of Portugal, once amongst the foremost states of the world.—There is much else in the diagrams and the appended remarks circulated as a Supplement with today's *Observer*. We content ourselves, in closing with a reference to figures which show equally the rapid decadence of China tea in favour of the British producer, with the still more rapid,—indeed phenomenal advance of the Ceylon product. It was really only in 1885 that Ceylon tea was an appreciable factor in the figures for

home consumption, thus:—

(1) China	.. ..	113,514 000 lb.
(2) India	.. ..	65,678,000 ,,
(3) Ceylon	.. ..	3,217,000 ,,

The constrast in 1890 was:—

(1) India	.. ..	101,961,000 lb.
(2) China	.. ..	57,530,000 ,,
(3) Ceylon	.. ..	34,516,000 ,,

In a very few years Ceylon will be No. 2 of the Tea Countries of the world and her ultimate elevation to first places seems a not over-sanguine expectation.

INDIAN AND CEYLON TEA CROPS.

In our Chamber of Commerce return dating up to 27th April, the total export of tea is given at 20,746,144 lb.; but Messrs. Forbes & Walker in their circular in our commercial column, estimate that this may be increased to 22,500,000 lb. if the shipments up to the end of the month are included. Let us say 22 million lb. for one-third of the year, and it is evident with all we hear of heavy flushes and big gatherings that we are safe for a Ceylon export in 1891 of certainly not less than 60 millions lb.! The only troublesome contingency in the estimation of planters has reference to labour supply—doubt being felt in some quarters as to whether there will be a suffieiency of hands to pluck all the leaf.

This being the outlook for Ceylon, let us see how they stand in India. Through Messrs. W. Moran & Co. of Calcutta we have received the statements prepared by the Committee of the Indian Tea Association of the total "Outturn of Crop for 1890" and "the Estimated Crop for 1891" as follows:—

OUTTURN OF CROP OF 1890.

	lb.
Assam	45,416,721
Cachar and Sylhet ...	31,472,703
Darjeeling, Terai and Doors ...	20,022,625
Chittagong and Chota-Nagpore..	1,424,057
Dehra Dun, Kumaon and Kangra	4,000,000
Private and Native Gardens ...	3,500,000
	105,836,106

The total shipments to all places from the 1st May 1890 to 1st March 1891 having been 104,954,625 lb., the difference represents the local consumption and any small portion of last season's crop still to go forward. It will be seen from the above figures that the actual outturn was less than the original estimate by more than 9 million lb.

ESTIMATE OF CROP OF 1891.

	lb.
Assam	50,650,628
Cachar and Sylhet ...	35,864,680
Darjeeling, Terai and Dooars ...	23,286,439
Chittagong and Chota-Nagpore	1,488,264
Dehra Dun, Kumaon and Kangra	4,500,000
Private and Native Gardens ...	4,000,000
	119,790,011

being $4\frac{3}{4}$ million lb. over the original estimate of crop of 1890. Taking the shipments to other places at 10 per cent over those of last year and making allowance for local consumption, there will remain about 112 million lb. for export to Great Britain against $98\frac{3}{4}$ million lb. shipped there during the past season. It is possible, however, that the actual outturn of the crop of 1891 may be considerably less than the estimate as was the case last season.

It will thus be seen that while in 1890 Ceylon gave an export of 46,901,000 lb. or several millions above the average estimate,—in 1891, the export is likely to exceed the most sanguino estimate, if, as we now anticipate, it is above 60 million lb.,—India on the other hand was short of estimate last year by 9 millions lb. and the estimate for 1891 is only 5 millions above the original estimate for 1890 while grave doubts are even now being entertained of its realization.

For total export, the return for 1891 is likely to stand somewhat as follows:—

	To U. K.	Elsewhere.	Total.
India	109,000,000	7,000,000	116,000,000
Ceylon	57,000,000	4,000,000	61,000,000
Total lb. ..	166,000,000	11,000,000	177,000,000

If we take the home consumption of the United Kingdom at 200,000 000 lb. for 1891 this would only leave room for 34 millions lb. of China tea.

TEA PLANTING IN CEYLON."

Some time ago we noticed with hearty approval the series of illustrations of Tea planting in Ceylon published by Messrs. H. W. Cave & Co. from the photographs of the late Mr. Clerk. Mr. Cave was anxious to improve his brochure by adding a page of letter-press descriptive of each picture, and we suggested Mr. T. C. Owen as best able to do this if he could spare the time. A copy has now reached us with Mr. Owen's letter-press—admirably adapted and covering 12 pages and the publication with a page of statistics from "Ferguson's Directory" now appended, is one of the most attractive and useful little gifts—costing only a rupee—that can be sent from Ceylon. The Tea Fund Committee should distribute a few thousands of copies.

SALE OF ANOTHER VALUABLE ESTATE IN DIMBULA.

We now learn on the best authority that the purchase of Yoxford estate, Dimbula, the property of Messrs. Baring Bros., has been completed by the Ceylon Tea Plantations Co., Ltd. as from the 1st April. The cultivated acreage is 429 acres and the forest and timber reserve 49 acres, making a total of 478 acres.

The price paid £18,000 is a high one, but as the soil is exceptionally good and the jât with which the estate is planted is selected Manipuri, the property bids fair to become one of the finest tea estates in Ceylon. The factory is equipped with the latest type of engines and tea machinery. Mr. C. M. Robertson returns to Ceylon next month to take charge of Yoxford. The Ceylon Plantations Co., has now a magnificent expanse of tea on the side of Great Western.

ECHOES OF SCIENCE.

Electricity is a veritable factotum or servant of all work. A Swedish engineer has recently applied it to testing steel and iron for its hardness. It is well known that an electric current of sufficient strength will fuse a thin slip of metal or wire when passed through it. By making a number of experiments the engineer has found the strength of current required to fuse test pieces of iron and steel of different degrees of hardness, and has formed a scale of currents corresponding to a scale of hardness. In order to find the hardness of a particular test piece of the metal it is only necessary to find the current required to fuse it, and this can easily be done by means of an amperemeter. The corresponding figure on the scale gives the hardness of the piece.

Not long ago an ingenious young cadet of one of our scientific corps applied electricity to wake him in the morning, and boil his coffee. The minute hand of his clock was caused to press two spring contacts together, and thus send an electric current. to ring a bell which woke him at the proper time The current also actuated a small electro magnet,

which allowed some salphuric acid to run out of a spoon and ignite a match, which in turn lit a spirit lamp placed under the coffee boiler. By the time he was dressed for a parade his coffee was ready.

Rich deposits of phosphate of lime have been discovered by M. Philippe Thomas, south and north of the high plateaux of Tunisia, from the Chotts to Medjerdah. Those of the south-west are the most important, and will be very valuable when a railway has been run to them. It is estimated that in the upland of Gafsa there are at least ten million tons ready to be removed. The beds of the north-east and the north-west also promise to repay their exploitation.

The dental vibrator is an apparatus for rendering the extraction of teeth painless. It is simply an application of the well-known electric shock utilised in medicine and sometimes to be had at country fairs. An induction coil giving a very rapidly intermitting current is the source of the electricity, and the patient receives the shock by grasping metal handles connected to the poles of the secondary circuit of the coil. The forceps of the operator are also connected in the circuit of the current. The consequence is that the patient feels only the peculiar sensation of "pins and needles," produced by the intermittent current traversing his nerves, and the actual pain of loosing the tooth is said to be masked. The vibrator has been introduced into the Institute of Medical Electricity.—*Globe.*

UVA PLANTING REPORT.

BADULLA, May 1st.—April has been a singularly wet month: very little sun and very heavy plumps in the afternoons. 7·73 in. in 2½ hours on the 8th was the heaviest rain I have ever seen. Slips everywhere. Wash last week a common experience. Tea which did so well in March commenced well in April. Towards the end of the month it fell off owing to insufficiency of sun heat; a little sun would give most of us more than we can manage in the way of flush. May and June generally are our best months. The way tea is growing and better still flushing is most encouraging, and we are all very hopeful and confident of Badulla being second to no upcountry tea district. Clearings in coming season are many, and a large acreage will go into tea next monsoon.

Coffee crop is ripening well, and bug is absent and estimates will be generally exceeded. All lower estates which have coffee in good heart and duly cared for have had good blossoms for autumn, and if the rains had put in an appearance a fortnight later than they did, this would have been the best blossoming season for some years past. Higher coffee is looking well and should do fairly in coming seasons.

Cinchona, at present prices, is naturally looking particularly robust, that very little bark will be harvested this season, for the sufficient reason that it would not pay to do so, except when trees are of especially good character.

LEASE OF VALUABLE PLUMBAGO LAND.

R15,100 PER ANNUM.

The lease of a plot of land situate in Maduragoda Kurunegala district and known as Mopitiyakanda about 11 acres in extent was sold by public auction on Thursday afternoon last at the Kurunegala Kachcheri by Mr. Allanson Bailey, Government Agent. There was a large number of intending purchasers present. Tenders were invited and it was notified that if they did not come up to the amount fixed on by the Government Agent, the lease of the and would be sold by auction. The highest tender it appears was R12, 000, and the Government Agent having intimated that he would not give the lease for anything under R15,000, bidding commenced at that figure. Messrs. Attygalla Mohandriam and Paulis Silva, both large plumbago merchants put in a bid of R100 more and became the purchasers. In the whole land there is only an extent of about 2 acres which it is said to contain plumbago. Considering the amount paid for the lease, what will not the land be worth? It appears that Attygalla Mohandriam who owns a pit near this land, dug the land in question for plumbago and worked for about a year when matters were represented to the Government Agent Mr. Murray, who despatched Mr. H. L. Ward to survey the land. This was done, and it was found that Attygalla Mohandriam was unwilling. After enquiry he was asked to pay up a sum of R1,200, and the land advertized to be sold.

AGRICULTURAL AND INDUSTRIAL ASSOCIATION OF FIJI.

The fourth Annual General Meeting of this Association took place at the Mechanics' Institute, Suva, on the evening of Tuesday last, 27th instant. Punctually at 8 o'clock, his Excellency took his seat, being attended by Mr. Spence, Private Secretary. The Secretary read the fourth Annual Report, as follows:—

COFFEE.—This product has become a thing of the past. Exports for 1890 were nil, against 5 tons in 1887.

TEA.—Notwithstanding the growing demand for this product there does not appear to be any satisfactory progress made in extending the acreage under cultivation. Exports for 1890 were valued at 1s 6d per lb., £140 2s 6d against 9½ tons in 1889.

SUGAR.—This product has asserted for itself no mean position amongst the exports notwithstanding the low prices still ruling. It is impossible however to say how long this export may continue. At present it would appear as not having yet merged from the position of being maintained entirely at the expense of the future. The Colonial Sugar Refining Company have made arrangements for leasing a large area of native land at Labasa on the Macuata coast, Vanualevu, for the purpose of starting a cane plantation. If the soil and climate prove equal to expectations, and there is no reason to doubt otherwise, operations on a large scale will be commenced by the company during the present year in that district which must undoubtedly greatly increase this product. Exports for 1890 were 10,000 tons, value £16 per ton, equal to £260,729, against 13,178 tons in 1889.

COPRA.—There is an improvement in this article of export as against that of last year and there is every prospect of a further improvement both in price and quantity and quality. Exports for the nine months ending 30th September, 3,085 tons value £27,765 as against the year 1889, value £39,138. There is still a very large quantity of copra awaiting shipment at the port of Levuka.

BANANAS.—This product it is satisfactory to note has been steadily assuming proportions which as an industry renders it first in importance to the Colony notwithstanding the persistency with which the shipping companies disregard the interest of the planters. The export of bananas for 1890 were for 9 months. 509,565 bunches, value, £54,059, against 531,008 bunches for 1889 value, £42,000.

COTTON.—There is every probability of a hopeful resuscitation in the cotton industry of the Colony. The acreage under cultivation is being extended both in supercession of other products and in fresh land. The unaccountable rise in price gave a stimulus to cultivation so that next year's exports may reasonably be expected to largely exceed those of the past year. Exports for 1890 were 50 tons, 16 cwt., 3 qrs., 17 lb. value £2,360 against 17 tons for 1889.

MAIZE.—The cultivation of this product has been entered upon largely by the free Indian population and it is probable it will figure as an export on a arger scale than heretofore during the ensuing year

The exports for 1890 were for 9 months 2,760 bushels value £720 against 4,704 bushels for 1889.*

MINOR PRODUCTS.—Of these vanilla remains the most important. Judging from the character of the splendid exhibits of this product at the late Exhibition your committee are more than hopeful that the exports of 1891 will number amongst them a superior bean. Arrangements are being made by his Excellency the Governor whereby the beans can be properly prepared in the necessary ovens which will be erected during the year 1891.

TOBACCO.—Hitherto this product has been grown principally for home consumption but there is some prospect of its being cultivated largely for export during 1891. That its successful cultivation will be confined to certain favourable localities is no doubt true, but your committee are sanguine as to its being a future export and believe that with a little patience and perseverance the company now being formed will soon be an accomplished fact.

FIBRE.—Immediately after the first Exhibition of your Association an effort was made by his Excellency to initiate attention to the advantages that would accrue to the colony as well as to those who would undertake the cultivation of some of the many valuable indigenous fibres of the country. Arrangements were made at a meeting held for the purpose whereby certain persons were to cultivate a certified area of any one fibre-producing plant and furnish a statement of cost and yield. The plants were to be supplied by the Government. Your committee are not aware whether this was done, but from the successes obtained in other parts of the world by the production of fibre between the time referred to and the present they feel that a serious and irreparable loss has resulted to this colony by allowing the matter to drop, and while fully alive to the value of some of the indigenous fibre plants, they have, through the Government, sent for the seed of the true Sisal hemp plant and hope shortly to have it here for distribution.

Your committee are satisfied that there is at present in the country sufficient of the true Agave Americana from which the "Pita" fibre is made as will meet the requirements of large areas of cultivation. His Excellency has already been the means of distributing sufficient seed from Tailevu as has planted some forty acres of land, and your committee have been informed that large quantities of seed can be obtained from other parts of the group.

To use an Americanism † your committee are of opinion that there are three products which the climate and soil of Fiji can produce better than any country in the world, viz., Fibre, Vanilla and Tobacco, and that it but wants special attention to be directed to these productions for a short time to thoroughly establish the future prosperity of the country.

It has been reported to your committee that the true Sisal hemp plant has been received by His Excellency from Kew.

LABOUR.—Your committee congratulate you on the satisfactory labour conditions which have existed in the colony during the past year, the grave importance of which can hardly be overrated, and they deem it to be a great satisfaction to know that whilst the import fee for foreign labour is being gradually reduced, that many improvements have recently been made to facilitate the recruiting of native labourers.

[The above is the main portion of a report which the *Fiji Times* denounces as unduly pessimistic. Tea for instance is in such large demand locally that as yet little is exported.—ED. *T. A.*]

AVOCADO PEARS IN COLOMBO.—Eight years ago, Mr. Cull planted two trees in the Royal College ground and yesterday he was able to gather eight of the fruit fairly developed and of good flavour.

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* It is to be feared that the enormous crop reported from the United States will again extinguish this industry in Fiji.—ED. *T. A.*

† We do not recognize the Americanism, but we see such English as this;—"sufficient seed * * as has planted!"—ED. *T. A.*

ARRACK AND COOLIES.

On all sides we gather evidence that the question of labour supply for our tea industry is fast becoming a burning and serious one. Advertisements for coolies are becoming common. Very soon we shall have a repetition of the days of old when notices ran "wanted a manager who can command labour," or "to an estate superintendent who can bring 100 coolies, will give a liberal salary" and so on. From Uva and other remote districts a real cry of distress is likely to go up as successive expanses of tea come into bearing and yield a succession of flushes which it will require many additional hands to overtake. Now it is at such a juncture that all interested in the industry must exert their ingenuity, carefully use their best judgment and urgent endeavour in order to supplement the existing labour supply or to devise means for economising and conserving it. The invention and application of labour-saving machinery and contrivances come under the latter category. There is a fine field here equally for the practical experienced Manager and mechanical Engineer. Improved machinery for the factory can do something, but still more do we want the application of labour-saving machines in the field:—wire tramways (worked from electric motors) to carry leaf to the Factory for instance. It will be more especially for the Committee of the Planters' Association to consider how the labour supply can best be supplemented, whether by special agency on the coast and (or) by endeavouring to move the Government to get its officers to encourage the poorer Sinhalese to take up the very easy and remunerative work of tea plucking in their immediate neighbourhood.

But our object more particularly today, is to call the attention of both the Government and the public to the letter of "H. A. T." from the Kalutara district, showing how the multiplication of arrack taverns is beginning to have a serious effect in diminishing the available strength of cooly labour and in demoralizing large numbers of our Indian immigrants. Here is indeed a matter of most serious import and one to which a remedy should at once be applied. The Planters' Association should ask Government for a return of any new arrack taverns opened, say, since 1st January 1890 (all over the island while they are about it) and publish the same. We are beginning to think that the universal increase in the sale of arrack rents this year is likely to prove an unmitigated curse to the community. We think the time has come to insist on repression rather than encouragement—in fact we should be inclined to insist that Government go back to the position occupied in 1874-5 when Sir Wm. Gregory had an Arrack Tavern Map of the Island laid before him to prevent any further extension of places for the sale of intoxicating drink. Then there is another evil which the Planters' Association may well call on Government to deal with in their own interests, as well as in those of the people and especially of the coolies. We refer to the sale of partially fermented toddy in certain districts to an almost unlimited extent, without fee or license, tax or duty to the revenue, but greatly to the detriment of Sinhalese villagers and estate coolies. We refer more especially to the Matale, the Kurunegala, Gampola and some other districts and think a great deal of good might be done by putting a stop to what is in reality an illicit sale of intoxicating drink. Let every District Association consider the subject in the light of local experience, and where there is no district body, a special local Committee might be organised, in

order that reports and full information might be sent in to the parent Association and so the whole subjeet be dealt with in a practical and complete fashion. In the interests of labour supply as much as of the well-being of the people, the matter is not one to be left alone.

FRUIT FROM TASMANIA AND FISH THEREIN.

At the Melbourne Exhibition of 1880-81, we had the pleasure of making the acquaintance of Mr. Shoobridge, junior, of Bushy Park, Tasmania. To him and the late Mr. Moody, in truth we were indebted for help in arranging the Ceylon Exhibits, Mr. Shoobridge putting off his coat for the purpose, in true colonial fashion. Mr Shoobridge himself was an exhibitor of hops which his father and he grow largely on their beautiful and fertile estate beyond New Norfolk, at the confluence of the dark-rolling "Styx" river with the magnificent Derwent, on the estuary of the latter of which the Australian Naples,—Hobart,—is built; rising up the sides of the foot hills of Mount Wellington. This mountain was white with snow and the pools at Bushy Park had ice on them, when we visited Tasmania for the first time in July 1881, and yet the wild rose and the gorse were, at the same time, in beautiful bloom. The dark colour of the Styx, which does not last all the year round, is supposed to be due to peat formations near its source. The noble Derwent originates in Lake St. Clair, which has an area of 10,000 acres. It is one of a series of grand mountain lakes, for which and for a dense forest under-growth, known as "horizontal" (from its habit of spreading) Tasmania is distinguished. Facing the antarctic pole as the island does, the cold of winter, (May, June, July,) is occasionally keen at Hobart and the south side of the island, generally, deep snow lying on the mountains. Launceston, in the north, (on the fine tidal river Tamar, fed by the waters of the romantie south and north Esk) has a much warmer climate and altogether Tasmania ranks next to New Zealand in its resemblance in climate to Britain. Hosts of visitors from Melbourne and other parts of the Australian continent escape to Tasmania from the fierce heats of the summer months, January and February. Better even than Britain, and better certainly than most parts of Australia, are the soil and climate of Tasmania suited for fruit culture. Accordingly, when we visited the Shoobridges in their beautiful and fertile homes on the alluvials of the Derwent, in July 1881, we found that besides hop culture their enterprise included apple and pear orchards which rank amongst the most extensive and the most productive in the world. By one of the great steamers of the P. & O. and Orient lines which goto Tasmania regularly to load with boxes of fruit, the Shoobridges alone have shipped 2,000 boxes of apples. As each box contains a bushel and each bushel is, on an average, made up of 150 fruits, the aggregate is 300,000 apples. This is only one of a series of consignments to England, and Mr. Shoobridge, as we yesterday indicated, is trying the Ceylon market, where apples ought to be appreciated for tarts as well as for dessert. What a treat it would be to expatriated Britishers in India, Ceylon and the Straits, if rich luscious pears equal in quality to the dozen which Mr. Shoobridge kindly presented us with yesterday, could be regularly supplied, as we hope they may be, although even winter pears do not carry so well as apples. It seems a great point that each particular fruit, free from the slightest bruise, should be carefully wrapped in tissue paper. In Tasmania, we learn, an apple tree begins to bear in its fifth year, and is in full bearing from the seventh to the twentieth year, the crop being counted by bushels,—we feel afraid to say how many, from each tree. Of course culture and manuring are necessary to enable the trees to produce good fruit in such plenty, although on many farms where labour was scarce, we saw trees laden with fruit amidst grass and weeds a couple of feet in height. It was enough to make a man's mouth water to hear from Mr. Shoobridge of the bushels upon bushels of apricots gathered this season from single trees. Apricots can be seen growing splendidly trained on walls at the exquisitely beautiful Botanic Gardens on the banks of the Derwent, near Hobart. Amongst the sights at Bushy Park are a fine oak, an equally splendid eherry tree, and hawthorn growing so strong and tall that poles cut from the hedges are exported to parts of New Zealand where all is grass. When Mr. Shoobridge, senior, originally settled at Bushy Park, he grew strawberries in such abundance that it did not pay to send the fruit to the Hobart market; and so, for many years, it has been an institution at Bushy Park to gather the children from all the Sunday schools within reach for a treat of strawberries and cream. The Shoobridges are members of the Wesleyan Church, and the uncle of our friend who visited us yesterday is a zealous local preacher. Mr. Shoobridge, junior, who came from Tasmania in the "Orotava," (which, by the way, made the voyage from King George's Sound in the unprecedentedly short period of $9\frac{1}{2}$ days,) has gone on to Britain as the chosen representative of the united fruit growers of Tasmania, to watch over and promote their interests and obtain from the shipping companies facilities of stowage and advantages of freight, such as will establish the fruit export enterprise on a steady and profitable basis. The matter could not be in better hands and for the sake of Ceylon as well as the fruit-eaters of England and the fruit-growers of Tasmania, we trust Mr. Shoobridge's efforts may be crowned with abundant success. When, more than a century back now, Britain commenced to send her convicts to Australia and especially to Tasmania, it would have seemed a wild dream to anticipate that from the antipodean colonies, as the products of the enterprise and labour of communities of intelligent freemen, the mother country should now be receiving supplies of gold and silver and copper, of grain and fruit and specially wool, the finest in the world. In the romance of emigration and commerce, there are few chapters so striking as that which records the settlement and advance of Australasia.

En route back to New Norfolk from Bushy Park, we visited, about midway, the ponds and streams devoted to salmon and trout breeding. As far as trout are concerned the experiment has long been a great success, specimens of the enormous siez indicated by 26 lb. weight having been captured by anglers in the Derwent. The trout in this river are of the colour and flavour of salmon, but in some streams where, probably, food is neither in quantity nor quality equal to that found in the great river, the trout are white in flesh and deficient in flavour. That there has been success with salmon ova has been hotly debated, but we believe there is now no doubt on the subject. Salmon have been bred, but curiously altered from the normal type by local conditions. One we saw in 1881 was shorter and much broader (probably to the extent of one-third, measured from belly to back,) than those familiar to us in our youth a

caught, in the stages of grilse and full grown salmon, in the waters of a Scottish Highlands river. Lake St. Clair is described as simply swarming with the trout which have made their way down the breeding streams into the Derwent and then up the great river to its mountain source. In the lower portions of the Derwent, especially at Bridgewater, very nice mullet abound which so readily take the bait that considerable bags of the fish can be secured in an hour or two of angling.

CEYLON TEA IN AUSTRALIA.

We call the special attention of the Chairman and Committee of the Tea Fund to the following correspondence. We have never met Mr. Foulkes, so far as we can remember, but all we have ever heard of his career while lessee of Lord Elphinstone's estate, Gikiyanakanda, in the Kalutara district, for many years, has been in his favour. He and his friend and colleague, Mr. C. Knight, did not make their fortune out of Gikiyanakanda—we suppose they rather lost; but the high reputation they both secured from all who knew them, and especially among the Sinhalese of the district, was something worth working for. When the bad times came, Mr. Foulkes went to Australia where the good work he did for Ceylon at the little Tea Exhibition for the Colony will be remembered. He continued in Melbourne and has been for some years now, we believe, working away under much discouragement, trying to create a demand for *pure* Ceylon tea and to make a living for himself out of the article. Unfortunately his pecuniary returns so far have been very limited and it is under these circumstances he sends us the accompanying letter which we have been advised to publish as the readiest means of attracting the attention of the Tea Fund Committee and the general body of tea planters to the case. But first we thought it well to send the letter on to Mr. Wm. Mackenzie as a gentleman who knows a little of Mr. Foulkes and his work and also of the importance of getting the Australians to drink pure Ceylon teas. We append Mr. Mackenzie's reply and hope his generous offer to sustain one-fourth of the required guarantee, will encourage a few more of the community to come forward to make it up fully. In any case, we agree with Mr. Mackenzie that the case is one well deserving the support of the Tea Fund Committee; for of the genuineness of the man and his work—and he an old Ceylon planter with a special claim on his brethren—there can be no doubt. We quote Mr. Foulkes' letter as follows:—

10, Palmer Street Fitzroy, Melbourne, April 1891.

Dear Sir,—Having taken a great deal of pains for the last 6 years, in pushing Ceylon tea in the Colonies and for want of sufficient means being unable to continue the work, as I should wish I take the liberty of explaining my situation to you in the hope that you may find two or three friends in Ceylon, to put me in a position to carry on the plan I have adopted, which all must agree to be a good one, for advertising the tea in Melbourne and neighbourhood.

First, as to my situation: I have been receiving tea from a gentleman in Colombo and on account of the heavy expenses incurred in pushing a new article amongst strangers, the profits on the teas sent me by that gentleman, have been entirely insufficient, wherewith to make both ends meet, and I have incurred a heavy debt (close on £200) to him and just at the time I was beginning to establish a name, he was unable to continue his support. Had I been able to go on I would have ere this reduced the outstandings by at least 30 to 40 per cent.

My way of distributing is thus:—I have established agencies (having had at one time nearly 200,) at shops in and around, Melbourne, who sell the tea in packets, on commission (and of these I have still nearly 100) calling on them fortnightly to collect, and on account of my not having a supply of tea in leaden packets, the business is going backward, and I am sure that had I a continuous supply of the same quality, and same wrappers, I should not only soon recover lost ground, but be able to considerably increase the agencies.

The teas in boxes are disposed of to householders, chiefly to those whose acquaintance I made at the Exhibition.

Now as to the terms what would be necessary, namely in that for the first lot of tea sent down,(£100 worth, as on accompanying memo) I be allowed a fairly long credit, and that after that further consignments be sent me in value, according with the amount of remittance sent by me from here, less from 10 to 20 per cent to go off the value of the first invoice.

Everyone must agree that my method of distributing is a good way of advertising, and I thought that there could be no harm in placing my proposal before you, thinking that you might bring it before one or two proprietors, or the Committee of the "Tea Fund."

The objection may at first be raised that there is no certainty as to the date by which the first outlay of £100 would be repaid; this, it would be unwise of me to fix as a certainty, but I believe that in the first 12 months I should be able to dispose of 15,000 lb. weight of tea—to increase yearly—and imagine if 10 per cent only was deducted from the remittances to defray this it would be cleared in 15 or 18 months.

I need not say that this method incurs considerable hard work, but I am thankful to say that I am in sound health, and fit for work, and am very loathe to be compelled to lose the profits that can be reasonably expected, as a result of the hard work I have done already here, and the anxiety I have gone through, to say nothing of a considerable amount of money (£200) received from home I have personally spent as a pioneer.

Surely, £100 invested by proprietors as I propose, would pay them as an advertisement, as it would cost them but the interest on it for a short period, and I know what I have done already has without the slightest doubt considerably helped towards swelling the exports of Ceylon Tea to Australia of late. This I state unhesitatingly without any braggadocio.

Should the guarantee be forthcoming it would be preferable for the Tea Fund Committee or whoever may act to purchase Tea of the "Chief Brand" which is well-known, provided of course there is no reason to the contrary, the matter of chief importance being that thereby a continuation of the same brand, as first sent and as nearly as possible the same quantity of tea. Annexed I send memo. of what the first consignment of £100 worth should be, if you are successful in finding the support I ask for.—Yours very truly,

S. W. FOULKES.

Memo.	£.
Broken Pekoe superfine in boxes 10 lb each	10
Pekoe in 20 lb and 10 lb (mostly 10 lb)	20
Do. 1 lb leaden packets	10
Do. ½ lb do. do.	10
Pekoe Souchong ½ lb	45
Do. ¼ lb	5
	£100

Mr. Mackenzie's letter is as follows:—

Thornfield, May 5th.

Dear F.—I have read Foulkes' letter, and can vouch for much of what he says, from my personal knowledge of him when in Melbourne, and from what my brother has frequently written to me lately.

I think this is emphatically a case for the Tea Fund, for which Mr. Foulkes has already worked hard, I mean during the time of the Melbourne Exhibition. Grants on a very liberal scale have already been made to gentlemen pushing our teas in Germany and Russia—and Mr. F. only wants a loan. He has a business—the result of much personal exertion in canvassing—and it would be a pity his hard work should come to nought. Then the teas he sells to small shopkeepers are pure Ceylon teas, which is hardly the case with those sold by any large importer in Australia, *blending* being universal among such,

I honestly believe R1,000 *lent* in this way, would do more good than *R10,000 wasted* on the *Kiosk*. [Regarding the Kiosk I must in fairness say, I have recently met *two* planters of standing who thought it might do good. *Only two* of the many I have questioned]. So convinced am I that Mr. Foulkes' work is doing us good, that I am willing to guarantee *R250* of the R1,000, which he wishes the Tea Fund to advance him in Tea.—Yours truly,

WM. MACKENZIE.

We heartily trust that three more proprietary planters or business men may be found to join Mr. Mackenzie in a guarantee of R250 each, and that the Ceylon Tea Fund Committee may make the needful vote for the tea now required for this honest, hardworking ex-Ceylon planter.

TEA IN INDIA.

The Calcutta brokers' circulars dated the 22nd of April state that weather reports from the districts are generally favourable, although more rain is wanted in Cachar. Samples coming to hand maintain good quality on the whole, although there is a slight falling off in teas from the Darjeeling district. The season will probably be an unusually early one, as some small parcels of tea have already arrived here and been shipped to London.—*Pioneer*, April 28th.

TEA-SEED FOR BRAZIL AND THE FUTURE OF THE TEA-PLANTING INDUSTRY.

(*From an Old Planter.*)

India and Ceylon should in their own interests, were they wise, refuse to sell tea seed to Brazil. The man should be boycotted who did. Putting such difficulties in Brazil's way as would retard her progress, even a year or two, means just as long a term of success for us.

The Madras Presidency too, asleep for a century, is gradually awaking to the fact that it can grow tea over an area many times larger than we have here, and that it commands all the labor !

RAMIE.—There appears to be some chance that ramie will yet come into vogue. The *Textile World* has seen samples of fancy worsted silk mix suitings, in which the silk effects were produced by ramie instead of silk threads, and so perfect was the imitation that it would puzzle an expert to detect the difference. Mr. Charles Toppan has now produced suitings entirely of ramie yarn of very perfect worsted appearance, white fine goods very much resembling linen, and now with his silk imitation so perfect, it seems that there ough of be an immense field for ramie in the very near uture.—*Planter and Farmer*.

IRRIGATION WORKS IN RAJPUTANA.—The revenue report on irrigation works in Rajputana shows that while the capital expenditure on the three groups of tanks was the same as last year, there was a decrease in actual collections of R2,466 which is not explained. There was a decrease however, in the working expenses, the cost per acre irrigated being R1·62 against R1·83. Some information as regards the experimental cutting of crops is furnished in the report. The highest produce per acre for wheat crop was 22 maunds of grain and 40½ maunds of straw. The value of these were respectively R55 and 10, and the expenditure is put down at R18 per acre, leaving a profit to the cultivator of R47. The difference between these figures and last year's is considerable.—*Indian Engineer.*

SCIENTIFIC PEARL FISHING.

So many suggestions have from time to time been made as to improved methods whereby the system of pearl fishing might be more economically pursued, that if there were not some radical objection to be taken to them, it seems to be conclusive that they, or some of them, would ere this have received adoption. When stating this view we would not wish to confine the scope of discussion to our own experience in Ceylon. Pearl fisheries are carried on, on a larger scale elsewhere throughout the world than off our own little island. Those of the Persian Gulf are well known, while around the coasts of Australia, and even in the rivers of Scotland experience has been gained which we think it may be possible would, if patent objection did not exist, have ere this induced those concerned with such fisheries to have employed the mechanical means available which are applied to other forms of fishing.

No doubt the cause for this disinclination to depart from the beaten track, apart from the expense and limited power in sea water of the electric light or other illuminants, is to be found in the special value of the pearl oyster and its susceptibility to rough methods of handling. Currents which bring over the beds which the oyster frequents, the efflux from muddy rivers cause its avoidance of grounds so affected, and very probably the same result would follow were the soil of its breeding banks disturbed by the use of mechanical agencies. There can be no doubt that the grasp of a clamp net would bring up at a single haul perhaps as many oysters as an individual native diver could raise to the surface in a day. But the first operation must entail a scraping of the mud, sand and coral blocks of the bank, which would be strongly resented by the oysters; whereas a diver collecting his prey with his hands and arms would, we should say, produce the minimum of disturbance. Then, again, there is the element of discrimination to be taken into account. Paid as the native diver is by a liberal proportion of the fully developed oysters collected by him, it can be readily imagined that he would reject with some amount of care those among the oysters which might seem to him to be immature, and that he would place in his basket none but those which were likely to make his own share of ultimate profit to him.

This consideration must certainly conduce to the avoidance of "scraping" the banks and causing an entire denudation of them. It would lead to the leaving upon the banks of a certain amount of seed which would in time enable them to refructify. Now the use of the clamp net or dredger could not be possessed of this quality of consideration. All would be fish that came into its net. In other words, its work might prove to be *too* thorough. The two points mentioned seem to us to be the two chief ones which would disincline the managers of pearl fisheries throughout the world to depart from the existing method pursued and to adopt one which, while certainly likely to be cheaper, would in the long run prove to be the more costly. We must, however, confess to imperfect knowledge of the exact *modus operandi* of the fishers for pearls in our Australian colonies and in the rivers of Scotland. In the latter locality it is not an oyster which supplies the pearls obtained but a mussel, which, however, our own pearl-bearing bivalve is, the difference being between fresh water mussels and the oyster-shaped mussels of the sea. The Scottish shell is found only in fresh water, or at all events in such estuaries as experience a change with the flowing in and out of the tides from salt

to fresh water. Perhaps some of our readers may be ablo to enlighten us more fully upon any peculiarities which may attend the collection at the pearl fisheries of the Australian continent and of its outlying fishing grounds. There are pearl "oysters" like our own off the coasts of Western Australia, quite distinct from the large mother-o'-pearl shells which are the chief objects of search on the Australian coast generally, and regarding the treatment of banks of such "oysters" Sir W. Robinson consulted us and obtained information in 1880. There must be some cogent reasons why no attempt has hitherto been made—so far as we are aware—to reduce the cost of collection by the employment of mechanical means such as are used for the gathering of the edible oyster. It is certain that the plan of assembling native divers is possessed of the elements of uncertainty and trouble which would render the employment of some unobjectionable alternative method very welcome. At the first sight there would seem to be little difficulty in conjecturing what such an alternative might be; but a more careful review of all possible ones inclines us to the belief that none of those which seem to be so simple and ready of adoption are free from possible objections to be taken to them. Wider discussion than has heretofore been given to the subject might help us to a fuller conclusion than has yet been possible.

We cannot help feeling, notwithstanding the failure of all the attempts hitherto made, that success will ultimately crown attempts to breed the pearl "oysters" artificially. Fascines or well anchored and floating lengths of coir rope or matting it water not shallower than five fathoms, might secure the end in view.

JUNGLE-HENS.—Mr. Simpson of the Telegraph Department differs from Mr. Parker, his overseer and Mr. Clark of the Forest Department, in their opinion, or inclination to believe that the jungle, like the domestic hen cackles after laying its egg. Mr. Simpson holds—and he is supported in his view by Mr. Broun, Acting Conservator of Forests—that the jungle-hen, in view of its many enemies, is most unlikely to make any noise and attract attention at such a time. He also points out that an overseer out watching for pig (at night surely ?) could not well be a good authority on the point at issue. Mr. Simpson adds:—"The jungle hen cackles, but only to call its scattered young together to attract the attention of its mate or after being startled or alarmed by an enemy."

THE RECORD BEATEN: CEYLON TEA SELLING UP TO £17 A LB WELL DONE HAVILLAND ESTATE, MR. W. A. M. DENISON AND THE O. B. ESTATES COMPANY.—We thought it would come and that Gartmore and its golden tips at £10 12s would be as badly beaten as some of its predecessors in the making and selling of "golden tips." Reuter today reports that a parcel from Havilland estate, Dolosbage,—the property of the O. B. Estates Company and managed by Mr. W. A. Mooyart Denison—has been sold in Mincing Lane for the extraordinary fancy figure of £17 per lb! We shall now have another round of paragraphs, exhibitions, tastings and other forms of advertisement for the benefit of Havilland and of Ceylon tea generally. Well, the more the better. The day is surely fast approaching when even the most benighted will think of drinking nothing else than Ceylon tea—in which case we can defy China, India and even Brazil!

COOLIES FOR NORTH BORNEO.—We hear from the best possible source that the S. S. "Memnon" is about to proceed to bring Hoihow to coolies thence direct to British North Borneo. In this venture we wish the blue funnel line and Messrs. Alfred Holt and Mr. Turner, and all connected with them every success. Planters one and all will hail the new departure we suppose, as it must certainly reduce the cost of labour. The plundering of the coolies in the houses of the Hongkong brokers and on board ship in Hongkong harbour, if it ever was a reality, will cease, and this alone should reduce the first cost of coolie labour. It should also be a ready means in getting a better class, assisting free or unindentured labour, preventing the change alleged to be so frequent of unhealthy for healthy men, and will remove the premium of free passages at present given to Hongkong ex-gaol birds.—*B. N. Herald.*

PLANTING NOTES FROM COORG, March 31st.—An inch of rain followed by a fortnight of bright clear weather is all that could be desired to insure a good "set," so that a fortunate few places that got that quantity could not possibly have fared better. The blossom on these places opened on Wednesday last, the 25th inst., and made a magnificent show. Places with an open, friable soil and steep places, which drain readily, have been comparatively free from leaf disease this season; but where the land is comparatively level with a retentive soil, thus rendering it liable to become water-logged, the trees suffered to some extent. They, however, recovered amazingly after the cessation of the wet weather, and, on the whole, the promise on the North Coorg estates was very good for next season's crop but as pointed out above, some of them have failed to get the rain and others have had too little. In respect of rainfall, the Bamboo, or South Coorg, District, which is the most extensive planting district in Coorg, has fared exactly similar to North Coorg. The ravages of the borer insect are thus early manifesting themselves. One indication of the destructive work of the borer is a grand show of blossom on a tree with poor wood. They invariably bear very heavily; and it is amusing to listen to natives attributing so much discriminating power to borers as to say that they seek out the trees with the best crop on them, as they find them very dainty morsels to feed upon! Thousands of coffee trees are lost year after year through this destructive agency, but this makes small headway in decimating an estate, if kept well under from the beginning, and vacancies supplied as they occur. It is impossible to get rid of the borer entirely. It is only possible to reduce the evil to a minimum. For this purpose continual war is waged against it, all the trees attacked being removed and burnt before the insects have taken to themselves wings and left them—a form of *sati* introduced by Europeans and not interfered with by the law. It will not, it is to be hoped, be out of place in these notes to notice some of the questions raised by Mr. R. H. Elliot in his letter dated 10th March on "The effect of soil on coffee seeds." In a former letter he said that he believed an eminent English authority was correct in recommending him to select seed from trees in the *poorest* and *most exposed situations* and to grow them in a nursery of *poor soil* (the italics are not Mr. Elliot's). He has somewhat modified his views now, as he says the trees need not necessarily be so poor as not to produce healthy plants; but of this no inkling was imparted in what he said before. If by healthy plants, plants entirely free from leaf disease is meant, it will not improbably be found that the nurseries required to grow them will have to be very rich indeed; and even then the chances are, if they are not transplanted early in the season into the field, they take the affection. To strengthen his position Mr. Elliot calls attention to the fact that the English farmer is careful not to remove stock on to poorer pasturage than they have been accustomed to, although he is by no means averse to removing them on to richer. True, but the farmer is likewise most particular to raise his stock from the most exceptional parent animals.—*M. Mail*, April 4th.

Correspondence.

To the Editor.

THE "MOMI" TREE OF JAPAN.

Technological Museum, Sydney, A 10th.

[The Editor, *Tropical Agriculturist*, Colombo.]

DEAR SIR,—Your Nanuoya correspondent, (whose letters I always read with both pleasure and profit,) says, at page 467 (Jan. 1st, 1891) that he cannot find the botanical origin of the Japanese word "Momi,"

I have had the enclosed copied from "Rein's Japan" which answers his query and also gives some information in regard to the tree.—Yours truly,

J. H. MAIDEN.

"*Abies firma* S. and Z., Jap. "Momi," is spread over the whole of Japan, more general however in Middle and Northern Hondo, and on the Southern Islands. It is found chiefly, and in the highest development, in mixed forests, among the beautiful deciduous woods, at an elevation of between 1,000 and 1,500 metres seldom isolated.

It developes the most magnificent trunk, of all tho Japanese firs, and grows in Parks and temple groves to a height of 30 to 40 metres with a circumference of 4 to 5 metres. In its entire bearing as well as in the character of its wood, this tree resembles the European *Abies pectinata*, but has a much slower growth.

Its wood is lighter, rougher, and less tough, than that of the pine, hence cheaper and less valued.

It is seldom used in house building."

[We and our readers are indebted to Mr. Maiden for this information regarding a tree from which so large a proportion of the timber used for tea boxes in Ceylon is obtained, boing prepared by American machinery and exported from Japan in shook.—ED. *T. A.*]

SALT IN AGRICULTURE.

Veyangoda, April 21st.

DEAR SIR,—I must thank Mr. Hoole of the Happy Valley for his very valuable contribution of Salt and its necessity for cattle, as greatly aiding us in our agitation for its issue at exceptional rates for agricultural purposes. It is a pity that his notes did not receive greater publicity than they did in the columns of only one newspaper. The affection of all animals for salt is notorious, and it is no new thing for a block of rock-salt to be placed in a stable for a horse to lick. For animals upcountry, a free use of salt is more necessary than in the lowcountry, and for reasons that are obvious. The desire for salt in cattle upcountry amounts almost to a mania, and my earliest experience of this was in the way tavalam cattle got at any clothing left in the fences of the gardens surrounding lines. One makes a snatch at it and runs away as if possessed, all the others follow him, and each manages to get a bite of the cloth in spite of the frantic cries of its owner and the endeavours of the tavalam men to save it. All this for the sake of the little salt in it owing to its having come in contact with the human body.

The information contained in Mr. Hoolo's letter of the ingenious use made of salt in keeping down the grass on a cricket field, will be of general use to those who find it an expensive job to keep trim a cricket field or lawns and esplanades. In the last *Household Register* I find, on the authority of an English dairyman who experimented with salt, that the quantity of milk in cows from whom salt was withheld for a week shrank from $14\frac{1}{2}$ to $17\frac{1}{2}$ per cent, and that the milk was inferior in quality, and soured sooner than when the same cows received salt with their food. Farmers and dairymen, it is said, salt their cows once a week, and lest they should forget the day choose Sunday. As has been remarked, salt in agriculture is more of a necessity on the hills in the centre of the island, than in districts nearer the sea-borde. As the European planter as a rule knows what he wants and how to get it, it was not necessary for me to dwell on its use and value upcountry.

I by no means advocate the general use of salt in agriculture at its present price. I have heard the opinion expressed that as at present prices the cost of a ton of salt and bone dust is equal, it will be preferable to use the latter. Without pretending to give my opinion on the subject *ex cathedra*, I would say, not invariably. As in the far-famed alluvial flats of the Mahaoya Valley, coconut cultivation is very often conducted in situations abounding in fertility, but with the means restricted for the roots availing themselves of the vast stores of plant food. As is well known, roots are able to *absorb* only the food contained in the soil. For this, abundance of moisture is necessary, as much to render absorption possible as to dissolve the food. Where a sufficiency of plant food exists it will be a waste of money to add to it, when what trees chiefly require to aid in its absorption is water. To such places I should say, salt is of far greater value than bone dust. For salt, in addition to possessing the property of rendering soluble the chief constituents of all plant food—nitrogen, potash and phosphoric acid—has the additional very valuable property of absorbing the moisture of the atmosphere. The Mahaoya Valley has an exceptionally rich soil and it would be perfect for coconut cultivation, but for the serious drawback of the soil caking as hard as a brick with the cessation of rain. During such periods, growth is suspended and bunches and branches droop owing to the leaves transpiring more moisture than the roots absorb. I am inclined to think that a free application of salt to trees in this district will, be preventing the soil caking and helping it to freely absorb the moisture of the atmosphere, act like a spell.

In this connection it will not be amiss to discuss what will be a fair application per acre. We have nothing positive to guide us. One authority tells us that two tons an acre in the cultivation of roots and cereals is an excessive application, and another recommends five cwt. per acre for wheat. We will have to strike the mean between theso two amounts, although it by no means follows that what will be excessive for the delicate, fibrous roots of cereals will be excessive for the tough and salt-loving roots of coconut trees. Yet we do not want to experiment with salt to find out how much we can apply without killing the tree. A correspondent to the *Observer* mentioned during the discussion on this subject a couple years ago, that he applied $\frac{3}{4}$ bushels per tree to a few trees in the Kurunegala district with wonderful results. This at 70 lb. to the bushel will mean 52 lb. per tree or 1 ton 14 cwt. 92 lb per acre of 75 trees. Well, we can look upon this only in the light of an experiment, and must regard it as an application no one will attempt over a large acreage for monetary reasons. With salt at R5 a ton, many will be inclined I fancy to use that quantity in exceptional situations, while in the generality of instances $\frac{1}{2}$ a ton per acre will be a very moderate application. This means, at 70 lb. to the bushel, 16 bushels per acre, or about six heaped measures per tree. This I fancy will be a popular dose. Now as to the method of application. Sowing the salt broadcast and working it in will of course be the most desirable method, but its cost and slowness will stand in the way of its universal adoption. Under the circumstances, I think it will be good to scatter it in a circle 10 ft. round the stem and to work it in, not necessarily deep, for the rains will do that, or what will be better, first stir up the soil and then apply the salt.

I appeal first to Mr. Dawson, as the Government Agent of the Province where cheap salt is most wanted in coconut cultivation; 2nd to Mr. Green as the ex-Minister of Agriculture, and who from his present position has greater influence with the Government, 3rd to the Government Agent of the N.-W. Province whose revenues will be appreciably increased by larger sales of salt, 4th to the Hon. Dr. Anthonisz who from

his place in Council has more than once descanted on the value of salt and advocated its issue at cheap rates—to aid us in our present endeavours, by advising the Government, even though unasked, to favourably entertain the agitation for the issue of salt to agriculturists on exceptional terms.
B.

[Has any experiment been tried with Kainit which consists so largely of salt?—ED. *T. A.*]

THE "TARING" OF CEYLON TEAS IN LONDON NO. I.

April 20th.

DEAR SIR,—We are constantly being told by our London Brokers "to keep up the quality and not the quantity" of our teas. From the accompanying memos of half-a-dozen of my tea sales, it is clear that *some one* does appreciate quality, to our cost, for it would seem to me the better the tea the more attention it receives, and the higher deductions are made. Take for instance shipment A in which the Pekoe selling at 1s 0½d, 10 lb. out of 2,700 were deducted, whereas the broken pekoe and broken orange pekoe were not so leniently dealt with in this A shipment. I would point out for the benefit of those of my brother planters who seldom if ever see a London account that the 81 boxes of broken orange pekoe contained 17lb net in each, and each box was under 28lb gross: what right then had the "some one" to deduct 1 lb from each 17 lb net, when each box weighed under 28 lb. gross? In your *Supplement* of April 11th, you quote from Messrs Geo. White, & Co's. Review for 1890:—"*Style of package*: Leafy kinds for self drinking often sell well in boxes, but to *avoid the 1 lb draft* they should be under 28 lb gross." My local agents wrote home to their London representatives, and I wrote direct to the selling broker: all the "satisfaction" we got was to be informed that the Tare must have been wrong (!) and this appears to me to be all the redress one is likely to receive for such a grievance. Is this justice, Mr. Editor, and should not our Planters' Association strive to place our interests on a better footing than they are at present? Who says the Planter is not taxed? Surely a glance at the figures I give will convince anyone that we are taxed and pretty heavily too, and what I have shown only points to the one of many.—Yours faithfully,

PROPRIETOR.

P.S.—Shrinkage of the wood of packages in transit is one of the reasons assigned by the brokers for loss of weight: how about a package leaving the factory under 28 lb gross?

Shipment.	Chests.	hf-chests.	Boxes.	Description.	Net wegt. in lbs	Price.	Short or deducted.
A			81*	Bro Or Pek	1,377	1/11¾	81
		52		Bro Pekoe	2,902	1/5½	101
	30			Pekoe	2,700	1/0½	10
	38			Pek Souchong	3,791	0/10½	68
B		95		Bro Or Pek	5,225	1/5¾	195
	21			Pekoe	2,160	1/0¼	33
	20			Pek Souchong	2,000	0/10¼	36
		17		Dust	1,636	0/7½	31
	2			Broken Tea	225	0/7¼	1
C		59		Bro Or Pek	3,287	1/5¼	104
	35			Pekoe	3,150	1/0½	80
	42			Pek Son	4,200	0/10¼	87
D		53		Bro Or Pek	2,968	1/5¼	98
	36			Pekoe	3,240	1/1	49
	40			Pek Souchong	4,000	0/11	93
E		40		Bro Pekoe	2,240	1/4¾	69
	30			Pekoe	2,700	1/1½	29
	36			Pek Souchong	3,600	0/11½	80
F		39		Bro Pekoe	2,1 5	1/4½	68
	25			Pekoe	2,250	1/1	40
	42			Pek souchong	4,200	0/11½	72
		16		Dust	1,539	0/7¾	39
	3			Broken Tea	340	0/9½	3

NO. II.

April 25th.

DEAR SIR,—In your issue of 23rd instant, in which you were good enough to publish my letter under the above heading, in your "Notes and Comments" you refer to the matter as if it was the fault of my selling broker: this gentlemen I beg to completely exonerate, as I believe the brokers have no hing whatever to do with this part of the business, which I am informed is entirely performed by that "monster of a monopoly," the "Dock Company" under the iniquitous system of weighing adopted—and to which we must submit I suppose—by the Customs. If this is not so, I hope some gentlemen more behind the scenes than I am, will be good enough to correct me. "Honor to whom honor is due," and I simply write this in defence of the brokers, who, I understand and believe, have no power or voice in the matter under discussion. The figures I furnished are instructive, and I woud call attention again to them. Take for instance shipment B: from the broken orange pekoe, value 1s 5¾d, 195 lb. was deducted from a total of 5,225 lb.; from the broken tea value 7¼d but 1 lb. was deducted from a total of 225 lb. Once more please refer to the very glaring practice to which hipment A: was treated: from only 1,377 lb. of broken orange pekoe and this too in boxes under the gross weight of 28 lb. in which case I think the general belief is that nothing is deducted; but here we are with 81 lb. taken of tea which sold at 1s 11¾d; in the same break pekoe selling at 1s ½d 10 lb. are taken from 2,700 lb. and from pekoe souchong selling at 10½d 68 lb. from 3,791 lb. Surely some steps should be taken to stop such, what seems to me, abuse.—Yours faithfully,

PROPRIETOR.

NO. III.

Ambagamuwa, April 25th.

DEAR SIR,—You want our experience *re* taring and bulking of teas in London: to please you, mind me, I will give you the following—only one of several experiences. I had two breaks of tea in London aggregating 6,900 lb. of tea or so of different grades; I had the inestimable (!!) pleasu be of receiving my sales with no less than 219 lb tea short weight, only a month ago. There, is Mr Editor! These teas averaged 11d a lb. That is how the money goes, and pop goes the planter.

C. T.

"THEFT OF TEA IN THE LONDON WAREHOUSES."

DEAR SIR,—It is abundantly evident that robbery wholesale and unchecked of our teas is going on in the London Warehouses. I entirely disagree with the theory that the Merchants and Brokers are blameless. That they are indifferent is very evident.

The remedy I would suggest, as a first step, is for the Planters' Association to send a communication to the Home Secretary pointing out the fact that a considerable percentage of tea is being habitually stolen in the London Warehouses and somehow smuggled into consumption without paying duty, thus defrauding the revenue.

Further, every Merchant and Broker in London ought to be called upon to take proper precautions. The London Association ought also to employ detectives.—Yours,

A SUFFERER.

CORAL FORMATIONS INLAND.

SIR,—In the Galle Talpepattuwa, at Miripenna, I have seen people excavating large quantities of coral stones at a distance of about quarter of a mile from the sea in coconut gardens fully fifty years old. Have you any record in Ceylon of how this came about? TRAVELLER.

[The explanation is that the coral has been formed in the sea and that the land is gradually rising. The Jaffna Peninsula, which rests entirely on a foundation of coral, has, doubtless emerged from the sea, within a period which is geologically recent. So with the southern coasts of the island.—ED. *T. A.*]

JUNGLE FOWLS AND THEIR CALLS.

DEAR SIR,—With reference to the extract from *Nature* concerning "Cackling of Hens," the writer wants to know if the wild jungle hen cackles when she lays her eggs. After much observation in jungles for many years, I should say the only noises made by the wild jungle hen are calls to her mate and cries of alarm. A wild bird conceals her nest with the greatest secrecy. The domesticated hen has many habits which are the result of long years of hereditary custom. For instance the wild jungle hen when disturbed with her brood flies off the chickens by instinct, rush and hide in all directions and lie quiet till the alarm is over, whereas the domesticated fowl calls her chickens and shelters them under her wings, which motherly act forms a pathetic theme to poets. I always understood that the domesticated fowl is quite a different bird to the jungle fowl. Even among the jungle fowl there are great differences. The Ceylon jungle cock has quite a different crow from the crow of the Indian jungle cock, and the plumage is different. The writer of the article in question seems to think that domesticated fowls are really domesticated wild ones or their descendants. He might as well reason that domesticated cats which were known in Egypt in the days of Moses are descendants of the fierce untameable fiery wild cat which it so much resembles in shape. One is not the descendant of the other, but both of course came from the same ancestor, and while one has advanced in savageness the other has advanced in domestication.

It would be an interesting thing if it could be ascertained whether the Veddas are the remnants of the enlightened race who built those grand cities (now buried) long before the arrival of the Sinhalese from the banks of the Ganges, or Tamils from the banks of the Cauvery. An originally civilized race run wild is very different from a really wild race; and I question with all humility if there be any really wild human beings in the world. But in the cases of the horse, the cat, the bull, the sheep, and the barn-door cock, and the dog, these animals though they have their duplicates amongs the wild animals, yet have been domesticated as far back as man has been known in the world. My idea is—

1st a common ancestor.
2nd a purely wild stock.
3rd a purely tame stock

"JUNGLE COCK."

IRRIGATION &c. THE HILLS AND RAIN: WANTED A METEOROLOGICAL ELECTRICIAN.

DEAR SIR,—I observe that you and your public are interested in irrigation matters: so perhaps some notions that have been simmering in my noddle for a while may be not amiss in your paper.

Water is wanted to grow paddy, &c., in the regions about Anuradhapura and similar localities. Artesian wells have been advocated. No doubt they are useful where found—in France, &c.—but the difficulty is, I apprehend, to find them in the North Central Province, or any other province in Ceylon.

Then the rivers have been suggested for a supply, but somehow they are far away, and to take them where they are wanted means a lot of trouble and expense.

There remains for us the waters of the firmament—the source of all the other supplies, and apparently an inexhaustible source—but the difficulty hitherto has been how to tap it.

It has been suggested that as the firing of cannon in a battle brings down a shower, it might be worth while to send up by balloon a lot of powder into the upper regions and explode it Let those who are not afraid of wasting powder. make the experiment.*

I had a discussion some time ago on the paddy tax, and afterwards a rainfall of ·21 was measured. Anyone desirous of carrying the subject or subjects further are welcome to my experience.

I have an impression, however, that the tapping of the upper strata of the atmosphere is to be found in another direction.

We see they have plenty of water and to spare in the hills. How do they get it? Perhaps some light may be thrown on the matter by understanding the operation of the causes that bring down the rain on the hills; and first as to the fact that the hills do bring down rain. The statistics of rainfall show that not only is the rainfall greater in, and near, the hills, but that those localities of a low elevation that lie in front of the hills in the direction of the coming monsoon have a greater rainfall than places of the same elevation, which have not the hills behind them.

Kalutara, which during the S.-W. monsoon has the high mountain range of Pedro behind it, over 40 miles off, has the greatest rainfall of any place on the west coast during the S.-W. monsoon.

As we take the statistics of rainfall north and south from Kalutara, we find the rainfall decreases towards Colombo and Galle. At Negombo and Matara—both well out of the range of the hill influence—we find a great diminution, and at Manaar and Hambantota, where there is no influence of hills, the rainfall is at the minimum.

Nearer the range of hills their influence on the rainfall seems to increase, as the statistics of Padiapolla and Kotmalie and similarly situated districts testify.

The fact being indisputable the next question is *how* do the mountains affect the rainfall. One theory is that the hills cool the air and its moisture by the usual process of conduction and radiation, and as the moisture in the air is cooled it becomes cloud and falls in rain.

Now it may be that the hills are cooler than the lowcountry, but has anyone actually tested the matter and proved that the ground on the hills is cooler than on the lowcountry *in a dry time.*

Be that as it may: however, I think the experience of everyone will bear out this, that the rain when it comes is cooler than the ground and actually *cools the ground.*

That theory then of the hills cooling the air by conduction or radiation may be set aside as insufficient to account for the rainfall on the hills;

* An experiment in Australia resulted in failure.—ED. *T. A.*

and still more as utterly inadequate to account for rainfall on the level ground forty miles in advance of them.

A more scientific theory has been propounded lately to the effect that the hills cool the air by their elevation. As the monsoon breezes with its moisture-laden air advances towards the hills, it has to rise to get over them, and in rising there is less pressure of air above it, and so it expands and the heat in it expands also and becomes less intense, and so the air and its contained moisture gets cooler, and rain is the result.

That this theory is true and the process discribed goes on, there seems no question. But that does not afford by any means a satisfactory solution of the phenomena of rainfall. If that were the *only* cause or even the *chief* cause in operation, what we would have would be a continuous drizzle on the hills while the monsoon lasted. What we have, however, is showers—heavy showers—lasting generally for half-an-hour to two hours, while the rest of the 24 hours is dry.

Of course there are periods of constant rain on the hills at the burst of the monsoon, but not all through; so that the heavy showers are not accounted for by that theory and the showers on the sea-level are not even considered in it.

To account for the frequent phenomenon of a heavy downpour in the lowcountry after a very hot day, something that is very partial in its action and also very powerful has to be considered. No cooling of air and moisture by the ordinary processes of conduction and radiation is sufficient. The cooling is effected by some agent acting above and not from below as the cold wind that precedes the shower proves.

Every such shower when seen from without shows a radiated texture, dark and light streaks either perpendicular or inclined invariably appearing, giving the impression of the shower phenomenon being akin to the borealis or streamers which are supposed to be of an electric nature.

Should we not find the chief cause of showers in connection with electric action, the thunder storms point to that.

It appears from the books on electricity that under certains conditions heat is transformed into electricity and *vice versa*.

Are we not justified in coming to the conclusion that somehow under the actio[illegible] the hills, the heat of the atmosphere passes [illegible]dly from the state of heat into that of electricity and so is conveyed away rapidly leaving the air and its moisture cooled to come down in the form of shower.

Is it not worth investigating *how* the hills effect this, and whether *any other means* could be used for effecting the same end?

Would not the Irrigation Board best serve its purpose by getting out a thorough Meteorological Electrician, or somebody of that sort, and setting him to study the cause of showers and how to produce them.

And then get the necessary apparatus put in order so that a district could be watered, and the tanks filled when required.

If only the way to tap the clouds could be discovered it would be better than Artesian wells or long watercourses.—Yours truly.

EXPERIMENTALIST.

LIBERIAN COFFEE IN THE STRAITS.

Government Plantations, Perak, Straits Settlements, April 30th.

SIR,—Enclosed I beg to hand you a paper showing what is being done in Liberian coffee in the native States.

The figures are Mr. Hill's, an old Ceylon Planter, and speak for themselves, and I should feel obliged if you could publish them as they will interest most of your planting readers.

Mr. Hill has a fine estate in this State (Perak), not yet in bearing, which I have seen. I was greatly pleased with the fine growth and healthy appearance of the trees which give great promise of crops to come.

Coffee Arabica is also being very successfully grown here, and I am trying to obtain statistics of that also.

I shall be glad to give any information in my power as to land, labour, &c., to my old friends in Ceylon.—I have the honor to be, sir, your obedient servant,

OLIVER MARKS.
Supt., Govt. Plantations, Perak,

Kwala Kangsa, April 30th 1891.

[We have already published Mr. Hill's figures and commented on them.—ED. *T. A.*]

AGRICULTURAL CHEMISTRY AND A LOCAL NEWSPAPER

SIR,—Not being a subscriber to the local "Times" I had not the pleasure of reading its remarks on "Salt in Coconut Cultivation," till I saw them reproduced in the *Indian Agriculturist*.

It is generally admitted that though common salt supplies no essential ingredients of plant food itself, its action in the soil in many ways makes it a chemical medium that should be easily available to, and readily taken advantage of by, all agriculturists.

Common salt is by far the most abundant of the salts dissolved in seawater in which it exists to the extent of nearly 3 per cent—magnesium calcide, calcium sulphate and carbonate, and a host of other compounds (the difficulty is to find what the sea does not contain, † considering that it is the receptacle of all the soluble and insoluble substances carried away by terrestrial waters) being present in a much smaller extent. But the subject that has been written on till it has become almost a nauseant, is not the effect of seawater but of salt on vegetation, and though salt as produced in our salt districts cannot by any means be said to be pure, still, when the effects of salt on vegetation is discussed, it is the sodium chloride and not the impurity mixed with it that is considered. If, however, there be, as the "Times" suspects, a sufficient amount of impurity of value as plant food (some phosphate or nitrate?) to produce an appreciable effect on the fertility of the land, in spite of the amount being infinitesimal in sea water, rather than sterilize our lands by pickling them in salt with the object of getting at its impurity (there is no need to burn down a house to get a roast pig!), the "Times" suggests that we should make an effort to identify our modest benefactor —and with this end in view to begin by analysing, the hot springs of fertile Bibile—and having identified him, proceed to "extract" him from the sea Such process, in the opinion of the "Times," might introduce to us some substance "not actually *sodium*" (a *metal* which, by the way, will be found to be rather a dangerous manurial acquaintance) to be used as a fertilizer.

* As our correspondent is aware, it contains silver in such appreciable quantity, that the extraction of that metal from it by a cheap process, is one of the problems which advancing science is likely to solve.—ED. *T. A.*

What potentialies might not the sea be shown to hold out to agricultuists, if that apathetic elass of indiviuals would but adopt such a course as the "Times" suggests! The suggestion, which is put forward "as a matter of scientific interest," is truly worthy of Prince Krapotkin himself!—Yours, &c., OLD SALT.

[About a couple of yenrs ago we quoted largely from Madras Government papers, reports of the manufacture of salt and the manurial value of the residunm. The conelusions arrived at were not encouraging, as regards the carriage of the substance to any distance, although it might be useful for coconuts or other culture near at hand.—ED. *T.A.*]

THE TEA FUND AND TEA KIOSK AGAIN.—We did Mr. Mackenzie injustice in supposing that he considered enough had been done to make our teas known in America. He would willingly transfer the "Kiosk" vote to the credit of further advertising in the Far West—or to the Ceylon Tea Court in the Chicago Exhibition. But on the other hand, while Mr. Mackenzie declares he is supported by every planter and broker whom he meets in condemning the Kiosk, we have the authority of large Australian tea-dealers for saying that even as regards the Southern Colonies, the Kiosk should be a most important means of increasing the demand for *pure* Ceylon tea. Nearly all our teas sent to the South at present are *blended*. To give passengers a good cup of tea and then a 2 lb. package or 7 lb. or 20 lb. box of the same, is just the very best means in the world of making our visitors whether from Australia, America or anywhere else, drinkers of pure Ceylon Tea only. But how to secure the good cup of tea? Well with servants doing nothing else and under the check of the utmost publicity—placards on the Kiosk asking passengers to report to the press if the tea is not good—and with a Committee of Vigilance, say of every member of the Tea Fund who visits Colombo, even Sinhalese Appus (having nothing else to do,) might be induced to serve a really good infusion each time. Let us have a trial of the Kiosk and see.

THE "KEW BULLETIN."—The March number contains an artiole on Dammer gum-resin from New Caledonia, and one on the improvement of the Cotton Cotton Orchid growers will be more interested in crop in West Africa by the introduction of Egyptian the full list of the Orchids which flowered at Kew during the season of 1890. No fewer than 766 species and varieties are enumerated—a number which will create some astonishmeut. The large number is accounted for by the circumstance, that not only showy Orchids are grown, but also representatives of as many genera and species, showy or not, as can be conveniently got together. In view of the groat interest felt in Orchids, it is highly desirable that the family be well represented at Kew, and that full advantage be taken of the present fashion to increase and consolidate our knowledge of the order and to preservo specimens, descriptions, and drawings for furture reference.. The largest number of species flowering in any month was 125 in May, the smallest number eighty-five in January, the average for each month being about 100. Among the more noticeable genera representatives of which flowered last year, there were sixty-nine species of Dendrobium, fifty-three of Masdevallia thirty-one of Cœlogyne, forty of Oncidium, twenty-eight of Odontoglossum, twenty-four of Cattleya, and thirty-eight species (excluding hybrids), of Cypripedium. Cypripedium longiflorum, Masdevallia pulvinaris, and Odontoglossum crispum might have been seen in flower through the entire year. The total number of species of Orchid now cultivated at Kow is 1342 grouped in 158 genera. We note that in some instances a capital letter is used for personal names, in others not=a variation which is a little puzzling to gardeners.—*Gardeners' Chronicle.*

"COCOA BUTTER"—we see has been selling at auction in London at from 1s to 1s 0¼d per lb.; but is this the product of the "Coconut" or of "Cacao"? "Cadbury's brand" of butter must refer to the latter.

THE "TARING" OF CEYLON TEAS IN LONDON.—We call attention to the letter of "Proprietor" in our correspondence column, and would like to know if his experience has been a common one upcountry among shippers of tea to the home market? As the figures stand the percentage of deductions, in certain instances, seems so outrageous, that we think our correspondent would be justified in changing his broker.

"PHOSPHORESCENCE."—With reference to an article in a home magazine headed 'The Cheapest Form of Light," we may mention that a writer in that wonderful repertory of knowledge, "the Orient Guide," disputes the correctness of the term "phosphorescence" as applied to the luminosity of the organisms (*medusæ, &c.,*) which light the ocean so brilliantly. He writes "The actual nature of the light has hitherto baffled investigation, but whatever it may be, the term 'phosphorescence' is a misnomer. Whether it is the result of an organic nervous force, which in other classes and orders of living beings is exhibited in the form of electricity, cannot be definitely asserted; but we are convinced that it is in this direction that the investigation should be pursued. Singular indeed will it be if the happy inspiration of a poet, clothed in fitting language nearly one hundred years ago, should point to a solution which still evades the keenest research:—

'——the waves
—spangled with phosphoric fire,
*As though the lightning there had spent their shafts
And left the fragments glittering in the field.*'"

But, after all, "phosphorescence" and "electricity" are but terms by which we designate phenomena, which even to science are still mysteries in their origin and nature.

MR. D. MORRIS AND THE LEEWARD ISLANDS.—The gentleman who was at one time resident among you to make inquiry into the origin and treatment of coffee leaf-disease, Mr. D. Morris of Kew, has but recently returned from a trip to the West Indies, and he has this week given the Fellows of the Royal Colonial Institute an account of the Leeward Islands. Mr. Morris described at considerable length the geographical position of the islands, which, he said, in point of scenery and in richness of tropical vegetation, forms one of the most beautiful portions of the British Empire. Reviewing generally the old and the new Leeward Islands, he said that the prosperous past of the islands was closely connected with a system of slavery and with the exclusive production of sugar. When slavery was abolished the whole fabric of the prosperity of the island immediately collapsed. It had taken more than half-a-century to attempt to build up another, and we only now began to see some promise of it. If cane sugar was ever supplanted by beet in the markets of Europe it would not be the fault of the West Indies. The lecturer concluded by saying that the islands had suffered from want of capital, from want of good internal communication by roads and railways, and from want of a rapid and suitable steam communication with the markets of the outer world. All these were in course of being supplied, and there was also a likelihood that good hotels would be built and visitors encouraged to make their winter homes in these beautiful islands, where they would become acquainted with the scenery of the tropics and find health and enjoyment in a world as new as it was interesting and instructive. Mr. Morris was cordially thanked for his paper.—London Cor.

THE EUCALYPTS.

On many occasions we have been called on to notice the conscientiously elaborated work of Baron Sir Ferdinand von Mueller on the Eucalypts of his adopted country. The "Eucalyptographia" indeed, is, and must long remain, the standard work on the subject. Thanks to a large extent to his zeal and energy, many of the species have been distributed in India, in our colonies, in Algeria, and along the shores of the Mediterranean generally. Some, such as E. coccifera, E. Gunnii, and E. cordata, are hardy in various parts of Britain, whilst in the Isle of Wight and in Arran, other species are found capable of resisting a climate which, in any case, must be less favourable than that in which they grow naturally.

In many of our colonies, such as the Cape of Good Hope, and in Southern France and Algeria, many more species may be grown with advantage than is the case here. It becomes, therefore, a matter of great importance to be able to discriminate the species, and apply to them the correct names. Many circumstances render this anything but an easy task, even in Australia. Our highly-valued correspondent, M. Charles Naudin, published, in 1883, a memoir dealing with about thirty species, as then known to him in cultivation. Since that time many new species have been introduced, and much fresh imformation has been gathered concerning those previously known. M. Naudin, by natural qualifications, long practical experience as a botanist and as a cultivator, and by favourable conditions for study, is specially well fitted to deal with these puzzling plants. He has grown many of them in the rich garden of the Villa Thuret, at Antibes, from the seedling to the fruiting stage; he has had them constantly under observation for many years, and been able to follow their vagaries and unmask the protean disguises assumed by some at least of them in successive stages of their growth.* The great value of the Eucalypts, depends upon their rapid growth. If they are planted for sanitary purposes, this rapid growth is all important, as tho trees affect the drainage of the soil by their roots, purify the air by their leaves, and possibly act beneficially by exhaling balsamic vapours, which are prejudicial to microbes, or which render noxious vapours harmless. If they are planted for timber' the planter has the satisfaction of knowing that no tree that he can cultivate will "grow into money', in so short a time, and that no tree will furnish a return for the outlay expended upon it in so brief a period as these so-called Gum trees. About a hundred species are known, but of these only a few are suitable for cultivation and in making a plantation of them, the use to which the trees are to be put eventually must be borne in mind. If for timber species remarkable for their rapid growth must be selected, such as E. globulus, E. Muelleris and E. gomphocephala. If timber of great solidity, density, durability be required, preference should, according to M. Naudin, be given to E. marginata, E. rostrata, and E. polyanthema. If planting for ornamental purposes, then such species as E. robusta, cornuta, botryoides, and leucoxylon are to be recommended. Outside the region of the Olive, of course, only the hardiest species can be cultivated, such as E. coccifera, E. viminalis, E. Gunnii, E. urnigera, and E. cordata. E. globulus is the best known species in this country, and of that, as we have recorded recently, there aro some thriving trees in the Isle of Wight and elewhere. E. globulus is also largely employod in this country in decorative gardening, the silvery foliage being very effective in tho flower garden. A fine tree at Hyères was figured in our volume for May 7, 1881. Of the large tree of E. coccifera at Powderham Castle, Devonshire, we give an illustration at p. 169 of our present number. E. urnigera, of which there is a fine specimen in Mr. Secretary Balfour's garden at Whittinghame, was figured at p. 461, April 14, 1888; see also p. 628, of the samo volume. At Menabilly, in Cornwall, is a large tree of E. Gunnii with a fine head and well-furnished from ground to top and of which Mr. Rashleigh obligingly sent us fruiting specimens some time since.

There are some who think that the *rôle* of systematic botany, at least as regards flowering plants, is played out, and that minute anatomy and physiology are the only departments of botanical science worth the attention for serious students—a singular reversal of what was the feeling or the practice at the time when the *Gardeners' Chronicle* was founded, and for a score or more years after. Looking at the matter, however, from a purely practical point of view, without reference to abstract science, we could hardly point to any case in which the necessity for observation and classification are more important than in the case of these Eucalypts. To know which are the right species to plant, we must know what are the qualifications which render them valuable, what are the discriminating marks which will enable us to indentify them, and what are the names by which they are called. To effect all this, we need the assistance of the systematic botanist, and M. Naudin tells us in the present pamphlet what are the points to which special attention should be directed. The foliage is very variable at different stages of growth, and an observation of the different modes of attachment, and of the different shapes of the leaves at different ages, is often useful in the task of discriminating one species from another. Thus, M. Naudin makes three groups:—1, those in which the leaves are opposite and all of the same shape; 2, those in which the leaves arc alternate and uniform; 3, those in which the leaves present two different shapes. These, however, are to be taken as indications, not as absolute statements, for, as usual, Nature refuses to be tied down by any hard and fast lines and exceptional instances are not infrequent. The configuration and texture of the leaves afford other "characters," as also does the shape of the cotyledons or seed leaves. There are differences also in "habit," in the mode of branching, the nature of the bark, and the way in which it is cast off. The inflorescence or manner in which the flowers are arranged, offers better characters, and the differences in the size, colour, and constrnction of the flower and fruit, are all valuable aids to the descriptive botanist. Acting on these criteria, M. Naudin furnishes us in the present treatise with a threefold synopsis, one in which the species are grouped according to the disposition and modification of the leaves; another in which theyare arranged according to the inflorescence and flower, and a third in which the grouping is made in accordance with the peculiarities observable in the fruit or capsule. These tables are, of course, purely artificial guides to facilitate research. By combining the data thus obtained, a more uatrual grouping is obtained as follows:—

Section 1. Inflorescence in cymes or axillary umbels.
- Capsules longer than the calyx-tube.
- Capsules shorter tnan the calyx-tubes.
  - Cymes three-flowered,
    - Leaves uniform, opposite,
    - Leaves uniform alternate,
    - Leaves of two shapes.
  - Cymes 3 to 7 or more flowered.
  - Cymes 7-flowered.
    - Leaves uniform opposite.
    - Leaves of two shapes, opposite at first.
    - Leaves uniform, always alternate.
  - Cymes or umbels, axillary, more thah 7-flowered.
    - Leaves uniform.
    - Leaves of two shapes.

Section 11. Flowers in terminal panicles or corymbs.

To this tabular statement, which we have abridged for our purpose, is added a detailed description of the fifty-six species known to the author as growing in the gardens of Provence. Other species are alluded to as not sufficiently known to be adequately treated of at present.

It will be seen that M. Naudin has once more enriched botany and horticulture with a treatise which demands and will ensure the gratitude of their followers.

* *Description et Emploi des Eucalyptus introduits en Europe,* second memoire. Par Charles Naudin (de l'Institut) Antibes, J. Marchand, 1891, 8vo, pp. 72.

General articles on the subject have been given in our columns on July 31, 1880, and December 24, 1887 and the appended list of species, illustrated in the *Gardeners' Chronicle*, may be of use to those interested in these plants.

Eucalyptus coccifera, June 30, 1888, pp. 799, 801. E. cordata, June 30, 1888, p. 803. E. globulus, November 22, 1873, p. 1567; December 24, 1887 (Supplement), p. 777. E. Gunni. December 24, 1887, p. 781. E. resinifera, August 3, 1872, p. 1541. E. Staigeriana, April 6, 1889, p. 437. E. urnigera, April 14, 1888, pp. 460, 461; June 30, pp. 799, 802. E. viminalis, November 24, 1888, p. 597.—*Gardeners' Chronicle.*

BRICK TEA.

In our issue of the 12th September last, and on occasions, we have suggested to our tea planters the advisability of making brick tea, as a means of defeating the fraudulent mixtures which are being sold in packets to the million in Great Britain, This packet system is a serious source of danger to the enterprize, as it introduces spurious mixtures under the name of pure Ceylon tea, or of Ceylon and Indian blends, whereby these fair names are used to obtain currency for inferior stuff. We have frequently warned planters that consumers of these packet teas have no means of knowing that they are not genuine, aud they accept them as being what they profess to be. In this way, Ceylon tea may be brought into disrepute, just as Ceylon coffee was, and like that article, may be discarded by the largest class of consumers.

We observe that the London correspondent of the "Ceylon Times" mention, in his last letter, that Messrs. Gow, Wilson and STANTON, the great Tea Brokers, have taken up the idea of making up Ceylon tea in brick form for the African market. Their object in pressing tea into solid cakes, or bricks is to save cost of carriage, facilitate trausport, and to preserve the aroma of the tea. By this means the difficulties of transporting a delicate and bulky article, like tea, in the wild country through which our teas would have to pass in order to reach consumers in the interior of Africa, are obviated, or materially reduced. At the same time, the quality is preserved from deterioration, in the rigorous climate of those parts by the compressed form which exludes air, and preserve the aroma. In our original suggestion we claimed this last named advantage, as deserving of consideration collaterally as well as the cardinal one of precluding the possibility of blending or sophisticating the genuine article.

The adoption of the pressed form of cakes or brick by Messrs. Gow Wilson and Stanton, has for its primary object the saving and facilitation of carriage. The other advantages specified are, for their purpose merely collateral. With us, the primary consideration was to defeat the fraudulent mixtures, which constitute a large proportion of the packet teas that are sent to the manufacturing districts for the use of the million. The saving in cost of carriage, the easier handling of tea in that form, and the preservation of aroma, which necessitates so much care in packing under the present system, are probably the objects originally contemplated by the Chinese in preparing tea in that form for the tremendous land journey between China and Russia. It is quite as easy to compress good teas as it is to make up the interior stuff that is sent in brick form to Russia. This is proved by the experiments of Messrs. Gow, Wilson and Stanton. There are, therefore, strong inducements for Ceylon planters to try prossed teas for ordinary consumption By this method their bulk may be enormously reduced the form of package would be simplified, and other economies, besides those above enumerated, in the saving of tea lead, &c., &c., would be effected.

In suggesting the brick form for tea the writer was reminded of a similar form in which gunpowder was submitted to him for trial during his experiments with Ordnance in 1860. The coarse-rained powder used for large guns was made up by one of the manufacturers into blocks, exactly fitting the gun, and thus serving the purpose of cartridges. Many experiments were made with charges of powder so made up, and the writer's recollection of them is that there was no appreciable loss of force in the powder so made up. The blocks were subjected to very slight pressure, in order to avoid injuring the granulation of the powder. The Block was held together by an almost insensible firm of mucilage. A plate of glass was slightly smeared with a fine mucilage and the powder was spread on the plate, which was then tilted, when all the loose grains left it, and a thin layer remained adhering to the plate. These were scraped off into a mould and lightly pressed. The block thus formed of the required size and shape, held together firmly, and was much more easily handled than loose powder. Of the ultimate result of the experiment we know nothing more as the writer made the experiments on behalf of the inventor, and had no more to do with the invention afterwards. We now revert to that experiment only to show a method whereby tea might be pressed into any required form of cake or brick. The actual quality of mucilage required, in the powder experiment was surprisingly small, and a still smaller quantity would be requirerd for compacting tea, because a severe pressure would be employed to reduce the tea to the smallest compass practicable, and the adhesion would thus be made more affective.

One further idea suggests itself to us in this connexion. Supposing, for instance, that the mucilage employed were of gelatine, would not its affinity for tannin tend to fir a portion of that somewhat objectionable component part in the process of brewing iu the pot? If so, the result of the infinitesimal admixture of the mucilage would be to improve the qulaity of the brew? Be that as it may, our suggestion of making up tea in brick form has received a great impulse by the experiment of Messrs. Gow, Wilson and Stanton, and we therefore repeat it with our earnest recommendation that some of the more enterprising of our planters should commence a series of exseriments on the making up of fine teas into brick shape. We may add, in conclusion, that a cake of tea dust, which was made up some months ago for us by a friend, was tried in the cup last week, after the cake had been exposed during that long iuterval and we found the flavour still good, and as far as we could judge, unimpaired. This fact, as far as it goes, confirms the opinion expressed by the eminent firm of brokers who have been preparing pressed tea for Central Africa, and adds an encouragement to the futher prosecution of what we hope may prove a safeguard as well as an economy in the production of our staple.—Local "Independent."

A BLOCK IN THE GROUND-NUT TRAFFIC AT PONDICHERRY.—It is estimated that there are upwards of 600,000 bags of ground-nuts at present stored in Pondicherry waiting shipment. This at 35,000 per load, represents 17 full cargoes. One steamer only is loading and about ten others are being engaged, but in the meanwhile the arrivals continue as heavy as ever averaging about 10,000 bags daily, which alone will require two steamers weekly. The town is filled to overflowing with the kernels and storage accommodation is wellnigh exhausted. The 12 new export sheds and the two large naval coal godowns, which are now being used for the first time, are totally inadequate to meet the increased traffic of the current season including the accommodation of former years. To clear off the accumulated stocks will severely test the shipping facilities of the port. The roads throughout the station are in an execrable state, and with the constant heavy wheel traffic passing over them there is no opportunity afforded for making proper repairs.—*M. Mail.*

SALT FOR THE GARDEN.

Haputale, 21st March.

To the Editor of the Ceylon Examiner.

Dear Sir,—Having read *B's* excellent letter on salt for Agricultural purposes, I would take the liberty to pen a few lines on what has recently fallen within the scope of my exprerience.

The plants in my garden here were subject to attacks from insects under ground. The worst among them were a kind of red termites or ants. I tried ashes and lime to get rid of them, but with little success. I then used Kerosine Oil mixed with water in the proportion of a wine glassful of the oil to a gallon of water with partial success, but not without injuring the plants more or less. Next I had recourse to salt, which had the desired effect—and more. For by its application I found that not only were the plants free from the pest, but those to which it was applied thrived better than plants of the same kind whichwere not attacked by theinsects, and therefore had no salt applied to them. The salt thus helped to bring on a healthy growth,and the v egetables treated with it were better relished on the table. I believe this is a proof of the disirability of the use of salt in the vegetable garden, especially on these interior hills, where there is little chance of any appreciable quantity of salt being deposited on the land by saline spray carried by winds from the sea.

Besides serving the gardener as an insecticide and manure, salt is useful to him as a hygroscope; *i, e,* it helps the soil to take and retain moisture from the atmosphere,—an effect that will not be lightly valued in seasons of drought. I intend continuing my experiments with salt in the garden, and hope to let your readers know the results in course of time. In the meantime, however, I cannot help stating that the use of salt for the above-noticed and other purposes in Agriculture show the desirability of placing it within easier reach of the agriculturist as regards the price.—Yours truly, E. T. H.

THE CEYLON EXPLORERS OF THE UPPER AMAZON.—Our attention has been called to the fact that we were in error in describing both the Land Commissioners selected by Sir Alfred Dent, as "retired" Ceylon planters. Mr. Sinclair is rightly so designated (though he still holds some property in Ceylon); but not Mr. A. Ross who besides holding extensive interests out here, had by no means, given up the idea of returning to work when he went home for health three years ago, and left his affairs in the hands of Mr. Munton of Kandy. Mr. Ross's places in Ceylon we are glad to learn, are all doing well, and doubtless after his trip to Peru, he will return for another spell of work here and he will be heartily welcomed.

THE HIGH-PRICED CEYLON TEA.—"Œdipus" writing to the Melbourne *Leader* says:—

A parcel of Ceylon tea has been sold by auction in London at the outrageous price of 87s per lb., and has been resold for 110s. Not even a sample is now to be had at any price as it has been put into glass cases for exhibition at the retail shops of the purchasing company. Nothing is said about the gross weight of the parcel, nor is there any testimony as to the flavor of the article, so that, after all, it may be that a cup of tea made from the ordinary sort at 2s a lb. may be intrinsically as good as that whichwould cost 2s a cup. It is a thing to be looked, at perhaps little more. The growers will, however, be stimulated to produce the article in such merchantable quantities as may enable tea drinkers to indulge in its consumption. It is related of Hoby, the bootmaker, that when in Paris he was fascinated by the appearance of a single boot displayed in a shop window, and he resolved to purchase it. He inquired its price, and received for answer—"Ah no! I cannot sell that boot, because I made it in one moment of enthusiasm." Perhaps the Ceylon tea grower may be in a similar position.

TEN MILLIONS—rather than one million—of acres of land is the limit Sir Alfred Dent's Syndicate are empowered to take up in Eastern Peru!

A NEW METHOD OF BUILDING WELLS.—Mr. Gunga Ram, Executive Engineer, Lahore, has invented a new and cheap method for building wells, for which the has taken out a patent. The secret of the invention lies in the use of specially moulded dovetailed brick, with which no mortar is required, and the bricks can easily be fitted and locked by unskilled labour. The wells would be both cheaper and stronger than those built in the ordinary way. —*Indian Engineer.*

FUEL FOR TEA.—It greatly suggested me to hear the other day from one of the leading men connected with Ceylon planting Companies that for the fuel used upon one of their estates he was paying £4 a ton! This instance is, of course, an isolated one. The estate has no fuel reserve, nor is it situated so as to obtain a supply of timber fuel from neighbouring sources. The consequence is the whole of its curing operation are dependent upon English coal, and the price of this delivered upon the estate is said to be that above given. What are you going to do when such instances become multiplied? It must surely be a crushing thing to have to pay such a price considering how large a consumption of fuel is needed for the preparation of tea. Can any of your readers tell us the proportionate value of wood and coal in such operations? For burning in locomotives the standard of relative values is—if my memory serves me rightly—about 3½ to 1, but this data might not hold in the furnace of a tea-drier. Any way, I realise from the information given to me how serious a question your fuel supply must be to you. You will really have to fall back ere long on some such proposal as you yourselves made some years back, to have wire-rope tramways from the forests of the lowcountry to serve groups of contiguous estates.—London *Cor.*

COLONIAL WINDFALLS.—Great Britain—says the *Spectator*—is not quite so fortunate as the United States, where every year they discover a mountain of cinnabar, or an oil-well yielding half-a-million gallons a day, or a silver mine which seems inexhaustible,—but still, we have our windfalls too. The new silver-mines in Australia are said to be of unsurpassed richness; Mr. Cecil Rhodes telegraphs about new gold-reef in Mashonaland about once a week; Canada has just discovered a vast deposit of silicious sand, which should enable her to make bottles for the American continent; Ceylon finds that her cocoa fetches double prices;—[strange the editor did not think as well of our tea the finest in the world, our pearl fishery and mines of plumbago and precious stones.—ED. *T.A.*]—and now it is reported that diamond-mines have been discovered in British Guiana, which, according to the Lieutenant-Governor, will be "a new and unrivalled source of prosperity for the Colony." As no increase of supply appears to glut the desire for the bright little stones, that prophecy may prove correct. We hope it will, for of all the Colonies British Guiana most sadly wanted a fillip, and the presence of capital sufficient to tempt the Colonists into public works. Curious if Raleigh's dream should come true at last, and a city of fabulous wealth arise in British Guiana! We hope the Colonists will have poetry enough in their composition to name the capital of the new diamond-fields Manoa. Mr. Rhodes would, and he will be hardly able to keep his fingers out of that pie.

WHITE WAX IN CHINA.

The native candles of the north are made of sheep's tallow but those of the central provinces are partly manufactured from bean oil which is able to be utilised for this purpose by the addition of white insect wax in the proportion of about one-eighth. Where bean oil cannot easily be procured the seeds of *Stillingia sebifera* are employed. This tree grows most extensively in the south. A picul of its seeds yields twenty or thirty catties of tallow, and when this has been pressed out, subsequent grinding and steaming result in the production of an oil called *ch'ing yu* out of the albumen. Insect-made white wax is added in the proportion of three catties to a hundred catties of the tallow. It is the wax which gives it sufficient consistency to remain thoroughly congealed in ordinary temperatures. From Hankow in 1889 about 120,000 piculs of the tallow of the tallow tree were exported and of this quantity nearly half found its way to Shanghai in the same year. An enormous quantity of candles are made in Shanghai and its vicinity and the pressing out of bean oil for the manufacture employs a large number of water buffaloes. The old industry is that which has for many ages made use of the tallow tree product. The new has grown out of the Newchwang trade which supplies Shanghai with beans. The vast industry which is an essential to the use of the vegetable tallow, began, we are told about six centuries ago. Till recently we knew generally that the wax is made at Luchou Fu, in Anhui, at Kiahing in Chêkiang, at Hinghua Fu in Fukien, as well as in Hunan, in Kweichou, in Yunnan and Szechuen. But the processes were never fully described and there was a need for fuller information. That want has been recently supplied by the inquiries of Mr. Alexander Hosie of the British Consular service in Szechuan. The tree on which the insects produce the wax is an inhabitant of a different part of the country from that which produces the insects. Chinese ingenuity brings the insects from their birthplace to their new home many miles away and sets them to the work of wax-making. It is this curious history which Mr. Hosie has been the first thoroughly to investigate.

The white wax insect was frequently referred to in old works on China. One object of Mr. Hosie's recent journey to the Chienchang valley near Mount Omi was to procure from the tree on which the insect lives specimens of the foliage and flowers, for Sir Joseph Hooker. These he procured and specimens of the living tree with the incrusted white wax on it as well as samples of the latter as it appears in commerce and of the Chinese candles made from it. The said valley is 5,000 feet above the level of the sea and is the great breeding ground of the insect. The tree is an evergreen with the leaves springing in pairs from the branches, very thick, dark green, glossy, ovate and pointed. In May and June it bears clusters of white flowers; succeeded by fruit of a dark purple colour. The Kew authorities now say it is the *ligustrum lucidum* or large-leaved privet. In March Mr. Hosie saw on the trees certain brown pea-shaped excrescences attached to the bark of the boughs and twigs. Opening some larger ones they presented either a whitey brown pulpy mass, or a crowd of minute insects looking like flour. Their movements were just perceptible to the naked eye. From two to three months later they become brown creatures with six legs and a pair of antennæ. These are the white wax insect or *coccus pela*. There is a beetle which is a parasite on the *coccus*. It is a species of *bracytarsus*. It is found in many of the excrescences above mentioned and burrows in the inner lining of the scale which seems to be its food. When a scale is plucked from the tree *cocci* escape by the hole which is made. It is in the town of Kiating that insect white wax is produced. This city is 200 miles to the north-east of the Chienchang valley. The scales are gathered in the valley and made up into paper packets of about sixteen ounces each. Sixty of such packets make a load and they are conveyed by porters from the valley to Kiating in the night time. If carried by day the insects would develop and escape from the scales. As it is, an ounce is lost in transit. A pound of scales in good years is sold for half a crown. In bad years it is worth twice this amount. In favourable years a pound of scales produces four or five pounds of wax. In the plain round Kiating very many plots of ground are seen edged with stumps from three or four to twelve feet high with numerous sprouts growing from their gnarled heads, as on pollard willows in our own country. The tree is probably *Fraxinus Chinensis*, a kind of ash. The leaves spring in pairs from the branches and are light green, ovate, pointed, serrate and deciduous On the arrival of the scales in May they are made up in small packets of from twenty to thirty scales which are enclosed in a leaf of the wood oil tree. Rice straw is used to suspend the packet under the branches of the ash or wax tree. Rough holes are drilled in the leaf with a blunt needle so that the insects may find their way to the branches through the openings. The insects creep rapidly up to the leaves where they nestle for thirteen days. They then descend to the branches and twigs and take up a position on them. The females then begin to develop scales on which to deposit their eggs, and the males to excrete the substance known as white wax. It first appears as an undercoating on the side of the boughs and twigs, looking like snow. It spreads gradually till in three months it is a quarter of an inch thick. In a hundred days the deposit is complete and the branches are lopped off. The wax is removed chiefly by hand and is placed in an iron pot of boiling water. The wax on rising to the surface is skimmed off, and deposited in a round mould. This is the white wax of commerce. It is used to coat the exterior of animal and vegetable tallow candles and to give greater consistency to the tallow. It is also used to size paper and cotton goods, to impart a gloss to silk and as a furniture polish. From Hankow each year at present about 15,000 piculs of white insect wax are exported in a year, and the main portion of it finds its way to that port from Szechuan. Chinkiang absorbs 1,000 piculs, and Shanghai 14,000 piculs. At Shanghai one half is for home use and the other half to distribute again to other ports. Tientsin requires 1,000 piculs, and Canton and Swatow a thousand piculs each. Thus it appears that while Szechuan is not the only producing centre of insect white wax it produces enough to furnish the most distant cities with the means to make a sufficient number of candles to maintain the temple worship as well as to enable the people everywhere to equip their lanterns for walking in the evening, and aid in night illumination generally. —*N.-C. Herald.*

NOTES ON POPULAR SCIENCE.

By Dr. J. E, Taylor, F.L.S., F.G.S., &c., Editor of "Science Gossip."

A year or two ago I drew attention in one of my letters to the discovery that the process of tanning could be accelerated by electrical currents. This has now passed into the region of commercial enterprise and is likely to be highly successful. Unfortunately,

for the discoverers, however, the patent was not taken out simultaneously in different countries, and so a lawsuit is the result.

The two hard-working French chemists, Messieurs Berthelot and Andre, have read a paper before the Paris Academy on the presence and influence of sulphur in vegetation. This paper is the result of a series of experiments, all of which indicate, among other things, that the proportion of sulphur increases in plants up to the time of their flowering, after which it decreases.

One of the most remarkable orders of flowering plants in the world is the Podostemaceæ, confined to South America, and especially abundant in the rivers of British Guiana. These plants grows on the submerged rocks in the falls and rocky beds of the rivers, where they break out into dense and beautiful sheets of pink blossoms when the waters subside during the dry seasons. The order comprises several genera and many species. The plants adhere to the rocks like sea-weeds by a disc-like base of the stem, which holds them with such tenacity during the stress and strain of the rushing waters that in removing them by main force a portion of the rock is often carried away with the plant. During a greater part of the year the plants are submerged, and they then float like sea-weeds do at the bottom of the sea. They take advantage of the dry seasons to flower and fruit. Dr. Goebel has been specially studying this remarkable group of flowering plants, and will shortly publish his researches.—*Australasian.*

SCIENCE OF THE DAY.

BY A B. SC.

The amount of agricultural experimenting carried on in the United States is really surprising, and if the American farmers are intelligent enough to take systematic advantage of it great national saving ought to result. As samples of the sort of work being done a couple of recent investigations may be described. The rearing of pigs is more largely undertaken in parts of the United States than in any other country in the world, and the problem with farmers has been how best to fatten pigs at the cheapest rate. Maizemeal has been a favorite feed, but experience has shown that after a certain point pigs cease to gain weight on maizemeal, although they can still put on a good deal more flesh on richer and more expensive diet. It had been noticed that the bones of hogs fed on maizemeal were smaller and weaker than usual, and it was inferred that probably the maize meal-fed hog put on as much flesh as his bones would carry, and that if only enough bone-making food were supplied the fattening on maizemeal could be carried much farther. Farmers had tried mixing wood ashes in the maizemeal with some success. At this stage the Agricultural Station of the University of Wisconsin took up the enquiry; it was proved first by breaking tests that the bones of maize-fed hogs were much weaker than they ought to be, and meanwhile several lots of hogs were reared on different diets, some on maize, some on maize and wood ashes, and some on maize wood ashes and bone meal or ground bones. The use of bonemeal reduced the cost of putting 100 lb. weight into a hog by 28 per cent. It is evident how important such a result must be to thousands of farmers in the United States, who for years have practically been wasting a quarter of the feed given to pigs.

At another experimental farming station a series of trials were made as to whether it could be made to pay to plant special fields of honey-bearing flowers for bees. The conditions are hard to satisfy, the plants must be such as will grow in waste ground that cannot be put to better uses, the seed must be easy to gather, and easy to sow, and the plants hardy. Three plants of most promise were tried, but the results were pretty clear that so far as these experiments went it could not be made to pay to grow feed for bees. However, the thing is to be still further tried in the interests of the many scientific beekeepers who are kept anxious by the strange fluctuations in the honey yield of wild flowers.—*Adelaide Observer.*

MANUFACTURE OF SALT IN CHINA.—In China, salt which is a government monopoly, is obtained by the evaporation of the water of the brine wells which abound in certain districts of Sz-chuen. The wells are found about 175 miles from Chung-king, on the bank of an affluent of the Yang-tze River, near the flourishing city of Tzu-lin-tsin. The manufacture of salt, which has been carried on here for sixteen hundred to two thousand years, is conducted somewhat as follows, according to a recent Consular Report: By means of a rude iron drill, holes 6 inches in diameter and varying from a few score of feet to 5,000 or 6,000 feet in depth are bored in the rock. The boring sometimes lasts for forty years before brine is reached, and is carried on from generation to generation. When brine is finally found it is drawn up by bullocks in long bamboo tubes by means of a rope working over a huge drum. In the vicinity of the salt wells natural-gas wells are also found, from which gas is supplied to evaporate the brine in large iron caldrons leaving the pure salt as a deposit. The product of salt in the district is enormous. There are twenty-four gas wells and about a thousand brine wells now in operation, producing annually 200,000 tons of salt, valued at $5,000,000.—*Engineering and Mining Journal.*

BAROMETRIC PLANTS.—The *Petit Traite de Meteorologie Agricole*, by Mr. Cana, contains a list of prognostics apropos of the aspects that certain plants present according to the state of the atmosphere. The following are a few examples:—If the head of the gith (Nigalla sativa) droops, it will be warm; if the head of the same plant stands upright, it will be cool; if the stalks of clover and other leguminous plants stand upright, there will be rain; if the leaf of the wood sorrel turns up, it is a sign of a storm; if the leaf of the whitlow grass slowly bends up, there will be a storm; if the flower of the convolvulus closes, it will rain; if the flower of the pimpernel closes, it will rain; if the flower of the hibiscus closes, it will rain; if the flower of the sorrel opens it will be fine weather; if the flower of the same plant closes, it will rain; if the flowers of carline thistle close, there will be a storm; if the flower of the lettuce expands, it will rain; if the flower of the small bindweed closes, look out for rain; if the flower of the pitcher plant turns upside down, it will rain; but, if it stands erect, it will be fine weather; if the flower of the cinquefoil expands, there will be rain; but, if it closes, the weather will be fair; if the flowers of the African marigold close, it will rain; if the scales of the teasel become close pressed against each other, it will rain.—*Melbourne Leader.*

SWEET-SCENTED FLOWERS.

One of the greatest charms of old-fashioned gardens used to be the number of sweet-scented, flowering and other plants they contained, and the fragrant atmosphere they consequently afforded at almost all seasons of the year. We have few if any roses so sweet as the old cabbage, monthly, and other varieties, and wall-flowers or gilly-flowers, stocks, violets, carnations, lilies, lilacs, and a score of others, as well as sweetbriar, and other, fragraut foliaged plants, were among the chief occupants, and always held an honoured place. We have greatly the extended list of subjects to choose from in these days, but though our gardens may be gayer than of old, they are decidedly not so sweet.

ROSES, are favourites everywhere. For fragrance the old cabbage rose is unequalled; then come the monthly Maiden's Blush, and many old-fashioned sorts: the more modern tea-scented varieties, and General Jacqueminot, La France, Bessie Johnson, and others among the hybrid-perpetuals; Celine Forestier (Noisette) is also very sweet.

WALLFLOWERS are simply delicious, and a favourite flower on account of their perfume alone. The single dark crimson variety is the most fragrant, though all possess a more or less pronounced scent. Old plants may often be seen in gardens, but the best way to have good wallflowers is to treat them as biennials

and sow seed every year in April or May for the next year's flowering.

VIOLETS, though not so showy, are even more sweetly perfumed, if possible. To keep the plants in good condition the best of the rooted runners should be selected and planted in deep and rich ground annually

The LILY OF THE VALLEY gives very little trouble; if once established in a bed of rich loamy soil, and a rather shady situation, they will remain in condition for several years, and produce an abundance of fragrant blossoms annually. Among the so-called

BEDDING OUT PLANTS there are comparatively few fragrant subjects, though the heliotrope, or cherry pie is unsurpassed for distinct and delightful perfume. Most verbenas are more or less fragrant, also double petunias and some of the single ones, the whiteflowered kinds in particular, but those are about all.

ANNUALS are rich in sweetly-scented subjects. Stocks are indispensable where fragrant flowers are valued and mignonette, sweet peas, and the night-scented stock (Matthiola bicornis) should be found in every garden.

NICOTIANA AFFINIS.—The sweet white-flowered tobacco plant forms a valuable addition to our list of fragrant plants. It is really a perennial and very nearly hardy, but is, best treated as a half-hardy annual, seed being sown in heat early in the spring, and the plants set out in May or June. Then the charming old white or

MADONNA LILY (L. Candidum) and many others are exquisitely perfumed, and candytufts, scabions, and a score of others are all worthy of place.—*S. I. Observer.*

[Meant for Britain, but applicable largely to our Ceylon mountain region.—ED *T. A.*]

CEYLON TEA IN AUSTRALIA.

We are very pleased to receive a letter from "the gentleman in Colombo" to whom Mr. Foulkes referred (page 858) as so long generously supporting him, in which he informs us that he is prepared to continue to send consignments of tea. This continuance of business will be on certain terms which will no doubt be readily accepted. Under these circumstances, Mr. Foulkes' Colombo supporter does not think it necessary to trouble Mr. Mackenzie and any other planters for a guarantee, nor the Tea Fund for tea. We are very satisfied indeed to have such good news of Mr. Foulkes being able to continue his tea business without intermission. We were just about to look up a letter of a year ago in which the 'senior editor' on his way back from Melbourne gave testimony to the good work done by Mr. Foulkes; but now neither this nor the appeal to the Tea Fund Committee will be necessary. Although not at liberty to publish the name of the writer nor his letter in full, we think we may quote one passage to show how Mr. Foulkes is trusted:—

"With reference to your article in last evening's paper headed "Ceylon Tea in Australia," I can confirm all that Mr. Foulkes says in his letter as I am the gentleman to whom he refers as being indebted to in the sum of £200. For some years past I have been sending Mr. Foulkes consignments of tea, with the result that the good qualities of PURE Ceylon tea have been prominently brought to the notice of many, who but for his intervention would probably never have tasted the pure article, but I regret to say the pecuniary returns both to himself and me have been anything but encouraging. I have been most anxious to do all in my power to assist Mr. Foulkes in his arduous campaign, and am still willing to do so; in fact I wrote to Mr. Foulkes a short time ago to the effect that I would continue to send him consignments on certain terms which he himself proposed to me; this being the case, I do not think there is any necessity for the matter being taken up by the Tea Fund Committee, nor is there any necessity for the further advances being made by me, to be guaranteed either by that body or individual gentleman, as I am quite satisfied that Mr. Foulkes will do his very utmost not only to push the sale of pure Ceylon Tea but to repay me the sums I have already advanced him for this purpose.

AN INSECT COLONY.

Probably Southern California counties contain at present no happier man than A. Scott Chapman—that is, judging happiness from a horticultural standpoint. Mr. Chapman has many friends in this end of the State who will be pleased to know that no longer are his feelings as blue as are the famed skies about his sunny San Gabriel home. A few years ago Mr. Chapman, who is an alumnus of Berkeley and for a time was a member of the State Board of Horticulture, was widely known as a very successful orange-grower. He went into the business energetically and systematically and the San Gabriel Valley contained no prettier groves than he could show on his thirty acres. Then along came the *Icerya Purchasi*, which being interpreted means that the cottony cushion-scale entered the pretty groves and ravaged those thirty acres like the free booters the best has always been. Mr. Chapman worked his grove, but the scale worked harder, as it had done in many other of the choice sections of the orange-producing region, and the result was the scale triumphed. No wonder the owner became blue and despondent. Down dropped the product of the grove to 600 boxes, instead of twice 6,000 which it had been producing. But this season, in February and March next, Mr. Chapman figures, in a letter just received by a friend here, these same trees will yield fully 10,000 boxes. That is why he is now feeling bright and happy. The *Vedalia Cardinalis*, the Australian parasite that feeds on the scale, has worked this beneficence. The ravaging scale has practically disappeared from the entire grove. The example is only one of many similar cases among the Southern California groves.—*S. F. Bulletin.*

RICE—RICE MEAL.

RICE.—The British working man fancies that rice is a dear article. He does not reflect that when he buys 4 lb. of potatoes he gets 3 lb. of water and only 1 lb. of food, and that 1 lb. of rice contains $3\frac{1}{2}$ times as much food as 1 lb. of potatoes, as may be seen from their analyses:—

	Water.	Flesh Formers.	Starch.	Total Food
Rice	13	6.5	80.0	86.5
Potatoes	75	1.4	22.6	24.0

Taking into account the loss in peeling the potatoes, 1 lb. of rice is clearly worth $4\frac{1}{4}$ lb. of the latter article, besides which, rice in boiling absorbs three times its weight of water, hence 1 lb. of rice, costing $1\frac{1}{2}$d, when boiled exceeds in weight, bulk, and food value, 4 lb. of boiled potatoes, costing 3d.

RICE MEAL.—Now we come to rice meal, which is composed of the outer skin of the rice grain, together with the "heavy offal" that is ground fine and mixed into it. The small proportion of husk that the heavy offal contains would not pay to separate; it does not materially lower the quality of the meal, and permits it to be sold somewhat cheaper. "Superfine meal," quite free from husk, can be obtained by those who want it at a higher price, but the bulk of the trade is in the medium quality, which is the best for general use, price and all things considered. In appearance it is exactly like oatmeal, but its somewhat bitter taste soon informs the human palate of its real nature. It is a decided tonic, and like cottonseed cake, it has a slightly binding effect on cattle that makes it the more valuable a food for them when out at grass in a wet season. Although rice meal is so well spoken of by those who use it, the consumption is extremely local, and is confined to but a few of those counties that are in easy communication with London and Liverpool.—*The Miller.*

MORTALITY FROM SNAKE BITES.

Concerning deaths in India from the bites of wild animals and snakes, the statistics recently published are not only enormous, but show an increase over former years in mortality, and Mr. J. Moray Brown, dealing with the subject in *Land and Water*, asks whether the circumstances under which the lives of over 20,000 human beings, and over 50,000 cattle are sacrificed annually, are not worthy of consideration? Not only in India do authorities concur that the evil is great and needs remedy, but in England also the matter is attracting considerable attention, and, though a variety of opinions have been expressed the mischief goes on. It has been urged that as civilisation advances, the *feræ naturæ* retire into the depths of the forest. It is true that, to a certain extent, this is the case, but not entirely, for anyone conversant with the habits of tigers and panthers—in especial—must be aware that there are among them individuals which prey almost exclusively on cattle and human beings, and which lay up for months in the merest pretence of cover, provided it be within reasonable reach of a village. On the other hand, snakes will be found in the most populous parts, and neither the Government House of a Viceroy nor the hut of the humblest peasant, is safe from their intrusion. The lethargy and superstition of natives themselves certainly offer great opposition to any radical cure, but lethargy and superstition can be successfully combated by the energy and determination of Europeans. The poisoning of wild beasts has been tried in certain places, but this is not only revolting to the Englishman in whose breast any of the traditional love of sport of his race is inherent, but is fraught with considerable danger to the individual desired to be benefited. Once poison is laid down, you know not where it may end—very likely in taking the life of some of those you would fain shield, for a certain sect or caste named the Dheres will eat any carrion they may come across. That the mortality from snake-bite is decidedly on the increase seems an acknowledged fact; but this may be due to a better system of reporting and it may also be urged that many deaths are put down to snake-bite which are due to other causes. This latter argument may, however, be met with the retort that many cases of death from snake-bite are never reported at all and so those should counterbalance the deaths wrongly attributed to the attacks of snakes. The matter has, no doubt, attracted the serious consideration of the Government, and Lord Cross has addressed urgent inquiries to the Indian Government, asking if nothing further can be done to check this mortality. The Indian Government, however, seems to be unable to suggest any remedy, and states that the general opinion seems to be that the system of offering rewards for their destruction has stimulated the breeding of snakes by natives, and the only plan that they recommend is that District officers should be instructed to see that all cover in the vicinity of villages is cleared away, while local Governments are left to decide whether they shall, or shall not, continue the system of rewards. Mr. Moray Brown thinks that if the prohibition to enter reserved forests, which has been in force for the last few years, were relaxed, and officers of the army encouraged to spend their leave in the jungles, the carnivora would be greatly diminished, and the forests would be no worse (though Government hope they are better) than they were 20 years ago. Such a course would not unnaturally be objected to by many Indian forest officers and official civilians, who would resent their private preserves, kept for their own amusement and the delectation of any distinguished globe-trotter, being shot by outsiders. But surely in the vast jungles of India there is room for both, and the measure would be more than compensated for by the knowledge of the country and its inhabitants acquired by military officers, to say nothing of the manner they would thin the ranks of destructive wild animals at no expense to Government! As to the destruction of snakes, though there are numerous varieties of snakes in India which are more or less venomous, the following are the most destructive to life:—The cobra (*Najatripudians*), the krait (*Bungarus cœruleus*), kuppur (*Ecleis, carinata*), the hamadryas (*Ophiodhagus elaps*), the raj-samp (*Bungarus fasciatus*). Sir J. Fayrer suggests "that a plain description and a faithful representation in colour of each species would make the people acquainted with the characters which distinguish the venomous from the harmless varieties," and he suggests further that a scale of rewards, varying from eight to two annas should be given for each snake killed, according to its poisonous propensities. Mr. Moray Brown goes further, and proposes that in every village should be displayed in a public place, where every ryot and traveller could see them, life-size painted clay models of the five most venomous snakes. These could be produced at a comparatively trifling cost, and would familiarise the population with the appearance of their great enemies. But he thinks the Government might also appoint men with a knowledge of natural history for a certain period to travel about the country, and after thoroughly investigating the subject, report upon it, and recommend some course of action. Let a certain fixed sum be devoted to this. From R30,000 to R40,000 ought to cover their salary and travelling expenses, and this would not be an out-of-the-way sum to expend on the experiment, and if extended over a period of, say three years, would be hardly felt by the revenue. By adopting such a course the Government would be more likely to obtain a suggestion of some value, and much unnecessary burden would be shifted from the shoulders of a very over-worked class—namely, the Indian civilians who have multifarious other duties to attend to. In conclusion, he says, "we have the men, and have the money to ameliorate, or endeavour to ameliorate the present condition of affairs, then why not make use of both?"—*M. Mail.*

GRAFTING OF COFFEE.

We have received the following letter on the subject of grafting coffee trees from Mr. J. Cameron, of the Lal Bagh Gardens, at Bangalore. It will be of great interest to planters who are thinking of trying the experiment of grafting Arabian coffee on Liberian stocks, for the purpose of rendering it less liable to leaf disease:—

BANGALORE, April 15th.

DEAR MR. FERGUSON,*—I am making a few experiments in coffee-grafting, but they are not far advanced, and I cannot tell you what the ultimate results may be; but for practical purposes in the field, I would strongly advise that experiments of the kind be put in hand to some extent on every estate. The grafted area need not be extensive until the results are proved advantageous. Inarching is the best mode of treatment, and for this purpose two plants of different varieties or of the same variety should be planted near each other in the same pit. When they are big enough they are united. Healthy seedlings of two years' growth would be about the age and size, or perhaps younger. An acre or two planted in this way with a view to inarching would soon discover the merits of the practice. The coffee shrub grafts very readily, and I have united the following successfully:

1. Liberian on Liberian; object, to hasten and improve bearing and to dwarf the tree.
2. Liberian on Arabian; object, the same as No. 1.
3. Arabian on Liberian; object, to strengthen the vegetative growth of the first named, and render it less subject to disease, etc.
4. Maragogipe on Liberian; object experimental.
5. Liberian on Maragogipe, object experimental.

We have grafted at present only a dozen or half a dozen, in each method, but there can be no doubt that coffee, like other fruit bearing plants, can be improved by this treatment.

I have no objection to your publishing my letter on the subject of grafting coffee, but I should first explain that the *modus operandi* recommended for estates, and that

* An Indian planter.—ED. C. O.

which I have practised here, are slightly different. For estate planting I have seconded your suggestion to place two seedlings in a pit, and subsequently inarch them when large enough; but with the object of making the plants portable, the stocks which I have used have been in pots. In fact, I have undertaken to supply a planter in Coorg with a number of grafts, and this was the readiest way of doing it. The pot plant is conveniently placed under the ground shrub, inarched in the usual way and eventually removed to another site. When the monsoon bursts, I intend to plant out the different grafts, a few of each, and cultivate them systematically under irrigation and shade.

Yours very truly,

—*Madras Times.* J. CAMERON.

TO THE EDITOR OF THE "MADRAS TIMES."

SIR,—I have been much interested in your article on grafting Arabian coffee on to Liberian coffee, as an antidote for Leaf Disease.

The difficulty of raising strong healthy coffee plants for extension or supplies, has been one of the main difficulties the planter has had to contend with in late years, and really seemed to threaten the existence of the industry. So violent has been the attack of Leaf Disease on even young nurseries, that the idea is current that the disease is now inherent in the coffee seed.

A very interesting experiment is being carried out by Mr. Thomas Murray, of the Glenva Estate, who having read of the successful treatment for smut in wheat, by the parboiling of the seed to be sown, thought that a similar treatment of coffee seed might have the same effect. The object of soaking the seed in hot water, was to destroy the fungus spores that might be deposited in the interstices of the bean, without destroying the vitality of the seed. The results of Mr. Murray's experimental nursery will be of great value to planters. I trust he will eventually make them public. So far the plants are growing well and seem freer of disease than plants adjoining, not treated in the same way. If we can get plants that will produce Arabian coffee, I have no doubt that the produce will be more valuable than Liberian coffee. The cultivation of Liberian is now extending rapidly; and the price at the present time is only some 20 per cent. less than Arabian; but this is probably due to the very small supplies of coffee now obtainable, and when stocks again begin to increase buyers will, as of old, make great distinctions in quality; and the comparative value of better and poorer grades of coffee will probably recur. The cost of cleaning and preparing Liberian coffee is also very much greater than Arabian. I think all planters should try this grafting experiment on a fairly practical scale. The result of isolated cases will not be accepted; while, if it is going to succeed, it is well that every one should practice the operation of grafting betimes, so that he may not be behindhand in the supply of plants. The cost of grafted plants may seem very great as compared with ordinary nursery plants. The plants themselves, as two will be required for each pit, will be double old rates: while it will take some time for a good nursery cooly to manage even ten grafts in a day. But, even if the cost of these grafted plants comes to R100 per acre, the extra outlay will be well recouped if healthy plants are secured. I would recommend that the coolies are first taught to cut, notch, and fit together branches of jungle trees of same size until they get proficient; the soft inner bark of many of the *Naar* trees, will form a good bass for binding the grafted trees together. If the air is kept out with good bass. I do not think any claying will be necessary. J. W. MINCHIN.

—*Ibid.*

A UNIVERSAL TEA CO.

By the "Teutonic" just arrived from New York there has come to London Mr. Elwood May, the President of the American Ceylon Planters' Tea Company. Shortly before leaving the States, Mr. May wrote to the Ceylon Association in London stating his intention of visiting England and placing before the Association his views as to the most profitable course to be pursued with reference to the future disposition of your teas. That letter has been shown to me, and I gather from it that what Mr. May desires to establish is the favourite Yankee method of "cornering." My own judgment upon his proposals to that effect is that they are of a wholly impracticable character. His ideas are quite of the modern American type, but the expression of them would certainly indicate that Mr. May is wholly unacquainted with the past history of the Ceylon tea trade, or of the firm footing obtained by the numerous distributors already working in the United Kingdom and elsewhere.

It is apparent to me that, if that gentleman had been acquainted with the facts as to that history and as to the present position, he would never have ventured upon the propositions set forth in his letter to the Ceylon Association. On receipt of this it was forwarded for the perusal of one of the most prominent gentlemen connected with the Ceylon planting enterprise. He returned it to Mr. Leake with the single word of comment of "moonshine," and that definition appears to me accurately to express what will be the general opinion as to what Mr. May has proposed. His letter opens in a very "high-falutin" style, and enters upon discussion of the large prices which cornering operations have obtained for a variety of products. More especial mention is made of the sugar grown in Cuba. Briefly stated, Mr. May suggests the formation of a Universal Tea Company having its headquarters in Colombo itself; that every Ceylon planter should dispose of his teas to this Company alone and that these should receive distribution throughout the world with the Company guarantee of purity.

Now it was something of this character that was proposed and discussed when first your teas began to make a name. The idea had at that time much to recommend it. It was at all events at such a date feasible. But even then difficulties were apparent which prevented the idea from being acted upon. It argues, we think, a very limited acquaintance on the part of Mr. May with all that has occurred since such an idea was broached that he should, at this comparatively late period in the history of Ceylon tea, deem such a scheme to be possessed of the least practicability. Mr. Mitchell, of Messrs. Darley, Butler & Co., which firm is the London Agents of the American Tea Company, was prepared to receive Mr. May on his arrival in London. We have not heard what opinion that gentleman has expressed upon the letter of the New York president, but we can hardly think he will hold any other but that which is generally entertained and has been above sketched out.

The simple fact that Mr. May deprecates and wants to abolish open competition in Ceylon tea indicates that he is preparing to "tilt at windmills." He will scarcely have been in London a single week before he will be convinced of the hopelessness of "cornering" the trade in Ceylon tea. He will find hundreds of established agencies all working independently of each other, and all on the principle of the widest and freest competition, which it would be hopeless for any Syndicate, however gigantic, to uproot. It is to be feared that Mr. May will suffer severely in his *amour propre* when the fallaciousness of the proposals of his letter is exposed to him; nor can it be anticipated that a gentleman who has shown such a great degree of unacquaintance with the course of the Ceylon tea trade in England can,

by any measure he may propose, beneficiently affect the prospects of your planters as regards the trade outside of America.—London *Cor.*

CEYON TEA IN EGYPT.

Messrs. Edgar Kirby & Co., of Alexandria have received from the Ceylon Tea Growers' Association a sample of tea very similar in appearance and practically of about the same value as a small quantity of tea from the Gartmore estate in Ceylon which was sold a few weeks ago in London at the fancy price of 10£. 12s. 6d. per lb.

The small sample received by Messrs. Edgar Kirby & Co. is a sample of tea from one of the estates of the Ceylon Tea Growers' association of which a small consigoment has been forwarded for sale in London but, of course, it is impossible to foretell wherever buyers will again be found willing to pay price of upwards of 13s. per ounce. The tea in question is of marvellous fragrance and Messrs. Edgar Kirby & Co. will be pleased to submit the sample for inspection to any connoisseurs who may favour them with a visit at their offices.

We may also mention that Messrs. Edgar Kirby & Co. are now daily expecting a further consignment of new tea from the last crop grown on the Ceylon Tea Growers' Association's estates.—*Egyptian Gazette.*

VALENTYN'S HISTORY OF COFFEE.

[This might as well appear in the *Literary Register* before it is lost altogether.—*Cor.*]

"Coffee which makes the politician wise
And see thro' all things with his half-shut eyes."—POPE.

TO THE EDITOR OF THE CEYLON TIMES.

Dear Sir,—I send you for publication, if you think it would be generally interesting, a translation from the Dutch of Valentyn's history of Coffee. It would be perhaps necessary for me to mention, that Valentyn lived in the early part of the 17th Century. As a Dutch Minister of the Gospel he visited a great many parts of the world, and the knowledge and information he thus obtained of those countries, he has given us in five folio volumes, entitled "*Keurlyk Beschryving van Choromandel, Pegu, Arracan, Bengal, Mocha, &c.*, A. D. 1727." There is also a history of Ceylon comprised in the above work which I believe has not yet been translated into English; but it is however when treating of the affairs of Mocha, that he enters into a description of that country and gives a lengthened account of the Coffee tree and its uses. For the sake of convenience, I have divided the entire chapter into several parts, which I will send you from time to time. It will be seen that Valentyn has taken great pains to bring together all the information he could obtain on the subject; and, on the whole, a great many curious facts and circumstances are mentioned by him, in respect of Coffee, and Coffee bibbers, which are deserving of notice, and would no doubt afford some amusement to the public in general, and your up-country Coffee planting friends in particular. With these brief remarks, I subj in my first instalment, hoping your readers would excuse any inelegancies and incorrectness of expression I may have fallen into, in endeavouring to preserve the spirit and give the exact meaning of the original.

I am, dear Sir, yours very truly,
P. B.

August 16th, 1856.

THE COFFEE TREE AND ITS USES.

From Valentyn's Description of Mocha.

General description of the Coffee Tree—Its cultivation in Amboina &c.—The Arabian mode of planting—Derivation of the word Coffee—Its preparation for use—The Author takes tea with an Indian Minister for the first time in his life, and finds it no better than Hooy-water (infusion of Hay) and, three years after, in 1684, takes another sip of the same beverage in Rotterdam.

"Inasmuch as Coffee has now become the principal Article of Commerce, and has drawn so many strangers to Mocha, it would not, I think, be an unprofitable task were I to attempt a description of the Tree, its fruit, and of its use.

There is a striking difference between the tree grown in its native soil in Arabia, and those grown in Batavia, Amboina, and elsewhere from plants obtained from Mocha.

In Arabia the Coffee tree attains a height of from 10 to 12 feet, and is from 4 to 5 inches in diameter; but is tender and weak, though easy of being transplanted.

In 1707 I took six plants with me to Amboina,* of which I retained two, and presented the rest to some of my friends there.

From these plants, and a few others which were brought there a year previously by the Governor of the place Mr. Vanderstel, all the gardens of Amboina were in a very short time well supplied. In the third year after the planting of my trees (which were but a year old when I brought them with me) they yielded more fruit than I and many others had occasion for, whilst the number of trees in my garden did not amount to more than sixty. I found the fruit very tasteful and delicious and not quite so insipid as that of Batavia, and since this period their sprung up a great many more Plantations carefully laid out by the Natives in Amboina and beyond it.

With the view of giving the Trees a thick stem, I cut them short, not allowing them to rise higher than a large Albornyn, scarcely 5 or 6 feet high. By this means they became very productive and yielded an abundant crop.

Their stems assumed the thickness of about a man's arm, while the bark partook of a light brown colour and a somewhat rugged and uneven appearance, the leaf resembling that of the Citron tree though not quite so sharp pointed and thick and the colour of a dark green (*donker groen.*)

I made a trial with one of the Trees to ascertain whether it could be made to rise higher in Amboina than on its native soil, or at least, to know to what height it could be made to rise, when I found that it attained a height of about 12 feet, losing in a corresponding degree in girth of stem which was scarcely 5 or 6 inches in thickness, so that it was not equal to sustain the weight of its heavy tuft (*Kruin*) with a goodly load of fruit, in fact the tree seemed bent nearly to breaking, and would, perhaps, have snapped for the slightest breeze, but for the precaution I took to prop it up.

This tree might also be said to resemble a young apple tree of 7 or 8 years. It looks always green, never shedding all its leaves at one and the same time and it blooms, and bears fruit nearly all the year round, ripe and green berries being always found on the trees.

The nethermost branches have a tendency to shoot upwards, presenting sometimes the appearance of a pretty tuft or crown.

To such a branch there are generally from 10 to 12 leaves, two by two (*Twee aan Twee*) at a small distance from each other; the blossoms which are white assimilate with the Jessamine and impart an agreeable odour. The flower consists of five little petals which sprout from between the stem and the roots of the leaves; from this proceed the fruit, which in size can be compared to a *Coernoelie* (Cornel-fruit). It is first green, then almost red, and eventually assumes a dark brown colour, when it is in a fit state to be picked and exposed in the sun to dry.

It has an outer black husk, or parchment, which, when shelled, two idle beans are found closely joined to each other and enveloped in a thin pellicle (*ziet*

* One of the Moluccas or Spice Islands.

men de boon twee-ledig tegen een in een vliesje besloten leggen.) Of the pellicle more anon.

There are some who say that the fruit is edible when ripe, and that the substance which is found adhering to the kernel is very tasteful and palatable, but I have never tried it, the riper the fruit, the tougher and harder the bean, which when properly dried is in a fit state both for exportation and use.

The beans are not however eaten, but are planted and they spring up in 2 or 3 weeks and become fine saplings in a year; and in the course of 3 or 4 years more they get to be trees of about 6 feet high; they are then maintained at this height by constant pruning and by not permitting them to rise higher they bear most luxuriantly.

The Arabians plant them generally at the foot of some mountains and in the vicinity of damp and moist nooks (*hoeken*) for the plants require moisture and the shade of trees, especially when young, and hence, they have watercourses and ditches by which they now and then afford moisture to the trees, and continue to do so, until the fruit is fully matured and about to drop down, when they leave them to dry on the trees.

When the trees are not properly protected against the scorching rays of the sun, the blossoms wither and yield no fruit, and hence it is that the Arabians are wont to plant them under some high and shady trees, in rows.

Had I been so well informed in all matters relating to the culture of these plants whilst I was in Amboina, as I am now, I believe I might then have brought them to greater perfection.

The name of this fruit (or more properly of the beverage we use) is not Coffee with the Arabians, but*————Caweb, and with the Turks————Caweh, which some assert is an Arabian, and others a Turkish word, derived from the verb————Cahcewah (signifying an aversion to meals) it is likewise a word used by the Arabians to denote wine.

Now to understand how the coffee has so easily acquired that name through a bad pronunciation, it is to be recollected, that a little point or dot when placed over the —wanco, changes it to.................. cafeh (as the French call it,) and which in process of time the Hollanders designated coffee.

By caweh, the Arabians understand in the first instance Wine, and all such liquors as inebriate; secondly a beverage made from the Coffee shells or husk, and thirdly a drink prepared from the beans themselves, which beans they call Buun.

They say, that this fruit grows nowhere else but in their country. Experience has however taught us that it is not so; but what they meant to say is, perhaps, that Coffee grows nowhere better than in their country.

Whether this plant is the natural production of Arabia or introduced there from some other country remains a doubtful point, for there are some who assert, that it was brought there from Ethiopia, and others again that it was carried *thence* to Ethiopia. The latter supposition appears the most probable, since Mr. Ludolf and many others in their account of Ethiopia say nothing of coffee, for had the plant been indigenous to the country they would no doubt have made mention of it.

Coffee is nowhere procurable in the whole of Arabia except in Yemen, and even there, only in the towns of Betelfagi Sanaa and Salbani. Betelfagi lies 35 miles from Mocha, and yields the best Coffee, and it is from this and the intermediate places between the mountains, that most of the Coffee of Turkey, Egypt, &c. is purchased.

I need not here mention how the common Coffee is prepared, for it is now so well known even to Pedlars (*Kraawers*) who go about from place to place that we need not take any lesson in this particular from Coffee dealers.

The use of this beverage has become now so general in our country that our maids and seamstresses could not be without it in the mornings, for they could not manage to thread their needle without some stimulus of this sort (*of the draad wil door het oog van de naald niet,*) I remember very well, that nearly 40 years ago, the use of Coffee as well as Tea was almost unknown in this city; the Messrs. Vander Brouk, and D. D. Leonards (who have been in India) were the only persons who partook of either. But both Tea and Coffee have now become important articles of trade.

I well recollect too, that it was in 1681 that I, for the first time in my life, took Tea with an Indian Minister, and could not then well conceive how it was, that people of judgment and understanding could take delight and indulge in a drink which tasted no better than *Hooy-water*, (an infusion of Hay); nor was I less surprised when, in 1684, I partook of a cup of Green Tea with a gentleman at Rotterdam, which cost him 80 Guilders the Pound; but then I knew nothing of Coffee, nor ever drank it. It has since however been introduced here, and it would appear, that it had for some time before been known to the English also.*"

* Arabic.

PART II.

How the Turks and Arabians prepared their Coffee—How they made a beverage from it, something like Allsopp's Pale Ale and drank it.—How the Hollanders and John Bull attempted Coffee planting and failed, and how the French succeeded beyond their expectations—The Pharmaceutical Garden of Amsterdam and the solitary Coffee plant which grew there which a Right Hon'ble Magistrate of that City laid at the feet of Louis the XIV. of France as a very rare natural curiosity.—What the great Arabian Physician Aboe Ill Sina and Bendjazlah an eminent Physician of Bagdad wrote about Coffee, and in what manner it was discovered, that the former knew nothing about it—Petrus Bellonius—The great Botanist and Arch Physician of Padua, Prosper Alpinus, and his Latin Treatise on Coffee, mummies, and hieroglyphic—The fanciful Petro Della Valle, who confounded Coffee with the Nepenthe of Homer, and the brave Nairon who bullied him and set him to rights on that point by showing him that Coffee was Coffee—The Italians import Coffee from the Levant, and the same Faustus Nairon who understood all the known and unknown languages of the East and West writes a big book in Latin about it—A French Treatise on Coffee by Sylvester de Four a Merchant of Lyons—lastly of certain Shepherds who used Coffee as an antidote against sleep, and of certain Monks who kept their eyes open during their nightly vigils, by the use of the same stimulant.

The Turks and Arabians seldom drink their Coffee in the manner we do, unless it were amongst the common people; but persons of respectability and rank generally drink the kingly Coffee, or Coffee-Royal.

They never prepare their Coffee with the beans, but with the bark or parchment only, to which they add a fourth part of the pellicles in which the beans are enveloped, and all those who partook of this liquor (which resembles English Beer) say, that for delicacy and pleasantness of taste, it far surpasses the common Coffee.

Like the Hollanders who attempted Coffee cultivation in Batavia, the English tried the experiment in Madras, but with little, if not less success, which induced them to abandon it. The French had likewise attempted the same thing on the Island of Mascaroigne in 1722, and is said to have been so successful, that 26 pounds of Coffee was put on board of the "Triton" for the reigning Duke.

An attempt was likewise made to cultivate Coffee in the Pharmaceutical Garden of Amsterdam, where they succeeded in raising one plant which the Right

* It would seem that a Greek servant named Pasqua who was brought into England by Mr. Dan. Edwards, a Turkey Merchant, in 1652, to make his Coffee, first set up the profession of *Coffee-man* and introduced the drink into this Island.

Vide Ency. Britannica, vol. 5, page 123.

Hon'ble the Magistrate thought fit to offer to Louis XIV King of France, in 1714, as a singular production of that country, since which however many more plants were grown in the same garden.

It is a matter of much surprise indeed that not one, amongst the Arabian or Persian writers in their accounts of the plants and shrubs of Arabia, had ever made the least mention respecting the Coffee tree, its fruit or its use, altho' Turkey, Arabia, Persia, and India were believed from a remote period to be Coffee-producing countries.

There are some, however, who assert, that the great Arabian Physician Aboe Ill Siuna, al as Avicenna, and Bendjaazlah his contemporary, likewise an eminent Physician of Bagdad, have in their work which treated of the Plants of Arabia, said something of the Coffee tree, and that the former tho' an Arabian has erred with respect to its name and fruit, by describing it as a root available for medicinal purposes, and giving to it the name of Buun, Buu, or Bunk; but it is evident, that he only spoke of the Root Bunk, which is quite another thing and different from the Buun of the Coffee tree.

It is equally surprising that none of those renowned Travellers who visited Ispahan in Persia, Constantinople in Turkey, and Grand Cairo in Egypt, or those who visited Mecca (which lies so close to the Coffee lands) or even those who visited Yemen in Arabia Felix have made any mention of the Coffee tree, or its fruit.

Nor does Peter Bellonius who travelled in the Levant and the East from 1546 to 1549 say anything of the Coffee, altho' he has written with much care and precision an account of the different varieties of plants of Egypt and Arabia.

The first European who made some allusion to Coffee, was that celebrated Professor and Arch Physician of Padua, Prosper Alpinus, one of the greatest Botanists of his time, who accompanied a Venetian Consul to Egypt in 1580 and remained there for 3 or 4 years, and subsequently published a very accurate account descriptive of the Plants and of the Medical treatment in that country, wherein he spoke also in praise of Coffee, and stated that he first saw the plant in the garden of one Ali Bey, a Turk at Cairo, and that the bean was then called Bun.

This work which was in Latin was printed and published at Venice in 1592, and was subsequently reprinted in 1638 at Padua; and in 1640 another edition of it appeared with some observations of Veflingius an eminent Italian Physician who had been likewise in Egypt, and was thus competent to undertake a revisal of the work, but he states that he found no such tree in any one of the gardens there.

Petro Della Vale, the traveller, in 1615, made mention of Coffee too, in the 14th Chapter of his work. He all along supposed, that the nepenthe of Homer (a remedy against sadness which Helen obtained from Egypt) was nothing else than Coffee taken with wine, but this opinion was shewn to be erroneous by Nairon in a neat little work he wrote on Coffee.

In 1626 Chancellor Bacon had likewise made some mention in his works respecting Coffee, though it was then wholly unknown in England.

But subsequently to this period, the Italians imported Coffee from the Levant, and it was then, that Faustus Nairon, a Maronite and Professor of the Oriental or the Chaldean and Syriac languages, at Rome, got a small book printed in Latin, the first of its kind, which treated of the use of Coffee. This book appeared in 1671, but it was evident that the author labored under some misapprehension in regard to the main points. Mention is made of this little work in a Diary of the Italians which speaks of the learned men of their time.

The best account, however, on this subject was written in 1671 by one Philip Sylvester De Four, a Merchant of Lyons, who first of all translated a certain manuscript on the use of Coffee, Tea, and Chocolate into the French language, and published it at Lyons.

We find this circumstance likewise mentioned in an extract from the *Journal des Savans* of 28th January, 1675, wherein we find also that Coffee was known to the English 20 years before the French had any idea of it.

It should be observed, however, that the writer of this manuscript was not fully acquainted with the proper Coffee lands, inasmuch as he had made a great mistake in supposing that it grow about Mecca, for Mecca lies at a distance of 70 miles from these lands.

Coffee having become somewhat better known at Paris, Lyons, and Marseilles, Du Four wrote a little work on the subject with special reference to what appeared in the *Journal des Savans* of 28th January 1685. This work was printed twice in Lyons in 1684 and 1688, and once at the Hague in 1685.

Mr. Bale, who, in his *Nouvelles de la Republique eds Lettres* introduces an extract from this work, as lase the Diary of the learned of Leipsic of March 1686, speak with much esteem of the Author.

This work was printed in 1685 in the Latin and German languages also, at Bautzen or Budissen in Saxony; the German being a translation from the Latin by Spon.

This work which consisted of 13 Chapters contained all that was ever known respecting Coffee.

There was afterwards another correct account given by Faustus Nairon to an Abbot of a certain Monastery, from which it appears, that Coffee had been in use with a certain Shepherd as a preventive against drowsiness and sleep whilst he kept watch over his camels and other cattle in the night. This piece of information induced the Abbot to administer the beverage to his Monks as an antidote against somnolency, whilst they were engaged in their nocturnal religious duties, and the thing succeeded to a miracle.

It seems to me as very probable, that Coffee or something like it was not unknown to the Ancients.

(To be continued.)

The Magazine of the; School of Agriculture for May is out, and the number provides both varied and useful reading. The contents include articles on the fatty and oily matters found in plants,—especially Ceylon plants,—their character and composition, refuse substances useful as fertilizers of the soil, cultivation of manioc, and further instalments of indigenous food products of Ceylon, and agricultural literature among the ancient Indians. Another interesting letter in the condition of agriculture in the north of the island is contributed by Mr. R.. Muttiah; and occasional and general notes fill up the rest of the number.

Ceylon and Indian tea Companies from the subject of some comparative criticism in the *H. and C. Mail* which we reproduce on our last page today. The critic wants fuller information in the Reports and Accounts of Ceylon Companies; but he cannot get over the splendid results in the case of the C. T. Plantations Company. We are glad to see how entirely this Company has adopted the rule, as far as possible, of buying up tea land to work through their existing factories. As a foil to this very prosperous concern, there comes the old Hunasgiriya Company under its new tea dress. It is uphill work with such old coffee plantations; but the prospects now are certainly very satisfactory for the Hunasgiriya Company.

Linnean Society.—At the meeting of the above society, held on Thursday, March 5, Prof, Stewart President, in the Chair, Captain T. Keene was admitted; and Messrs. T. B. Cato and E. Norman Langham were elected Fellows of the Society. Mr. D. Morris exhibited a dwarf species of Thrinax, which he found growing plentifully in the Island of Anguilla, West Indies, and which was apparently undescribed. Mr. T. Christy exhibited the fruit of some undetermined species of tree, which had been introduced into commerce by the name of Monchana, but the origin of which had not been ascertained. On behalf of Miss E. Barton, Dr. D. H. Scott gave the substance of a paper communicated by that lady, and entitled "A Morphological and Systematic Account of the Fucaceous Genous, Turbinaria."—*Gardeners Chornicle.*

THE NORTH-EAST MONSOON GOING OUT LIKE A LION: TORNADO, HAIL AND RAIN.

The distinctions of cyclonic storm, true cyclone and tornado demand attention in noticing meteorological phenomena. Cyclonic storms are common enough in Ceylon, especially during the South-West monsoon. Cyclones, which are rare, occur generally in the North-East monsoon and are almost confined to the North and East of the island. Tornados, which are cyclonic in their character, of extreme violence, but of limited extent and short duration, occur more or less frequently all over the island, but they have so rarely visited the Nanuoya division of Dimbula, that special interest attaches to the short but sharp experience to which the upper division of Abbotsford (elevation of factory 5,700 feet and bungalow 50 feet higher), was subjected on the 7th instant. The accounts which have reached us of this forcible phenomenon are as follows:—

Abbotsford, Nanuoya, May 8th.

Yesterday afternoon at about 2,30 it got very dark, and suddenly there was a bright flash and a crash immediately accompanied by hail and a high wind which blew a big wattle right on to the ladies' bathroom, bending and breaking the pipe, smashing the fence all to pieces, and wrenching 20 sheets of roofing from our factory, and blowing them clean over the whole building into the deep ravine below the cart road: six sheets attached to a reeper all went in one piece. Fortunately no further damage was done and no one was injured: the whole storm only lasted about 40 minutes.

Another account:—

We have had very peculiar weather since you left and have not yet seen the last of the N.-East monsoon. Tuesday was a lovely day with a pleasant N.-E. breeze, but no rain. On Wednesday it poured at the Lower Division where the rainfall measured 1·84, but at the Upper Division where it would be far more welcome there was only a fall of 90 cents

Yesterday (May 7th) there was a terrific squal about 2·30 p.m. which blew down several trees and carried away some 30 sheets of roofing iron from the S.-W. corner of the large withering house. The whole roof would have gone had the wind continued, but fortunately it was all over in a few minutes. The three-inch reeper to which the iron is fixed was smashed to atoms and the iron carried right over the factory and landed on the hillside towards Nanuoya. The reeper had held on some half-dozen sheets which would weigh fully a cwt., and yet they went clean over everything like the single sheets; so you may imagine what force the wind had.

I was of course one of those whirlwinds which we t occasionally get towards the latter part of tbo N. East monsoon.

The rainfall at the Upper Division was only 41 cents but at the Lower, when it was accompanied by some, hail, 1·10 fell within 20 minutes; and has no doubt done some damage to roads and drains. I hope this may be the last of the N.-East.

The occurrence of hail, the formation and deposit of which was, no doubt, due to the action of electricity, was a marked feature in this tornado; but it must have been confined to the vortex, as no mention is made of damage to the tea. Another curious circumstance is, that the rainfall should have been so much less at the centre of force than in the river valley 1½ mile distant and 1,000 feet lower in elevation. A memorandum furnished to us is as follows:—

Upper division May 6th	·60 in.		Lower division	1·83 in.
" " 7th	·42 "		"	1.10 "
	1·02 in.			2·93in.

nearly 2 inches difference, in favour of the lower division.

Why all the whirling wind should concentrate at the higher altitude, and the rainfall, due, no doubt to its disturbing effect on the atmosphere, should, in such large proportion, sweep down the distant and much lower river valley, is a curious problem. The significance of the remark that the rain would have been more welcome above is due to the fact that the factory and dam were constructed there, (unfortunately, we now feel), as a time when tea grown on the upper fields, was deemed merely a subsidiary product to coffee of which there were 320 acres. Like so many others, those interested in the estate refused to believe that coffee was fatally stricken until conviction was forced on them by crops and bushes dwindling away. The position of the factory has the advantage of being only two miles from the Nanuoya station, but had it been realized that tea would entirely supersede coffee, a site lower down would have been chosen where copious streams pour down in waterfalls. Statements like this may qualify criticism regarding not only the particular case, but other similar ones. It is hard that the aid of a powerful steam engine should be required on a place where water is so abundant, (at 5,000 feet and under,) that the Tamil name is *Aruvi totam*, "the Waterfall estate." It may be added that this experience of a tornado at the high elevation is unique. By all the laws of meteorology, it ought rather to have rushed through and revolved in the river valley. But who can understand and direct the course of clouds surcharged with electricity or calm the raging wind awakened into abnormal energy by the effects of the subtle and often deadly power or influence which we popularly call lightning? Happily, in this tropic island, though exposed to both monsoons, we know but little of the fiercely cruel and frightfully destructive storms, before which life and property are alike swept off the earth, in the river valleys and on the level prairies of "the Far West."

Since the above was written, the following special telegram from Nanuoya has come to hand:—

THUNDERBOLTS FROM A BLUE SKY.

(*Special Telegram*)

NANUOYA, May 9, 9 a.m.

Yesterday afternoon at 2·30 p.m., two balls of lightning fell apparently in a garden here, accompanied instantaneously by a fearful crash of thunder out of a perfectly quiet sky. There was a slight flash about 4 p.m., but no rain fell all day.

NOTES ON PRODUCE AND FINANCE.

THE ADULTERATION OF PRODUCE.—At a meeting of Metropolitan grocers held on Monday at the Cannon Street Hotel to discuss the question of trade organisation, Mr. D. R. Harvest, in the course of a speech, proposing a resolution for appointing a committee to carry out the objects of the association, said that an association was sadly wanted to protect the trade as much from the practice of dishonest methods within their own ranks as from outsiders. Prosecutions, he said, were enforced for the adulteration of food stuffs and drugs, and the retail dealers were often entirely without the means or knowledge of ascertaining whether what they bought to sell to the public was pure or otherwise. It was known that an article called pepper had been offered in the market which did not contain one per cent of pepper. On another occasion, a whole cargo of pepper which had lain for some time in a wreck at the bottom of the Thames washed with London sewage, and which stank abominably, and should have been destroyed, was put up and sold to the trade. They knew, too, that the Chinese made little clay balls exactly resembling pepper pods, and these were plentifully intermixed with pepper coming from that sunny land. An association would help them to

guard against these and other rascally practices and enable them to keep dishonest men out of their trade, for retail and wholesale dealers' best interests lay in that direction.

MORE TEA DRINKERS.—The growth of temperance and the increasing consumption of tea are facts which must be taken together. When the labouring classes renounce beer they usually take kindly to tea. The two last reports issued by the Registrar of Friendly Societies show that the Independent Order of Rechabites—the well-known temperance friendly society—is also rapidly increasing. The recent rate of increase is no less than 10,000 adult and 5,000 juvenile members per year, a degree of accession probably unprecedented. The total membership is now over 100,000 adults and 52,000 juvenile members.—*H. and C. Mail,* April 17th.

IMPORTANT APPOINTMENT TO ABERDEEN MEN.

We understand that the Peruvian Corporation (Limited), of which Sir Alfred Dent, K. C. M. G. of Messrs Dent, Brothers, & Co., merchants and commission agents, Old Broad Street, London, is chairman, have just arranged with Mr. Arthur Sinclair, Meadowbank, Cults, with whom is associated Mr. Alexander Ross, to undertake a piece of very important survey work for them in Peru. To the general reader it may be necessary to explain that, in consequence of grave financial difficulties into which it had got, the Government of Peru ceased to pay interest on its public debts (amounting to about £56,000,000) several years ago. And after protracted negotiations, a powerful British-Peruvian Corporation came to the rescue, headed by Sir Alfred Dent, who had done excellent work in connection with the British North Borneo Company of which he is still a director. Amongst the many concessions made to this company by the Peruvian Government, one was the right to select and utilise some 10,000,000 acres of land in the valley of the majestic Amazon river. The commission that has now been entrusted to Messrs Sinclair and Ross, on very handsome terms as to remuneration and otherwise, we understand, is to fix generally the locality for this very large selection, with a view specially to the adaptation of the land to tropical agriculture. For this purpose situation, climate, and the general capabilities of the prevailing soils will all have to be carefully noted and reported upon to the directorate of the Peruvian Corporation; and the work, including the passage to and fro, is expected to occupy not less, we believe, than five months. While it is not a little gratifying to find two local men selected, and appointed practically on their own terms, for such an important mission, no one who knows the career of either will doubt the wisdom of the choice made by Sir Alfred Dent and his co-directors of the Peruvian Corporation. Both have had ample experience of tropical agriculture as planters in Ceylon. In the case of Mr Sinclair, the fact of his having been bred to the occupation of gardener, with a good knowledge of practical botany, enabled him at once to take to the work in which he was engaged for a score of years, or thereby, in the "spicy isle" with the greatest advantage; and for a good many years he acted as general superintendent of a large number of coffee plantations with the highest efficiency, his duties in that way giving him an acquaintance with the conditions of tropical agriculture, generally, as well as with a large part of the area of Ceylon, such as few men have had opportunity of acquiring. And in addition to this Mr Sinclair spent over a couple of years in Australasia, chiefly in Tasmania, where he had further opportunities of observing sub-tropical agriculture. Mr Ross, whose Ceylon experience as a successful planter also extended over a long series of years, and who goes to Peru on the same terms as Mr Sinclair, is a native of Stonehaven.—*Aberdeen Free Press.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, April 16th.

ARECA NUT.—For 5 bags good quality the very high price of 30s per cwt. was paid today. This drug is exceedingly scarce.

COCA LEAVES.—Seven packages of Ceylon and Java leaves, both equally badly harvested, dark mould and dull, offered without reserve, no higher bid than ¼d per lb. being obtained; this was refused, as it was stated to be insufficient to cover the charges. In New York holders of Huanoco leaves (of which an arrival of 5,000 lb. took place towards the end of March) are very firm, and quote 1s 6¾d per lb. c.i.f. for fine dark green. Light green Truxillo (Maranon) leaves may be had at 11d per lb. c.i.f.

KOLA.—Of about 35 packages, only 2 bags mouldy grey dried West Indian sold at the high price of 6d per lb.

QUININE.—No business is reported on the spot this week, second-hand German bulk being quoted at 10d sellers, and 10¼d buyers. At today's auctions, however, 4,000 oz. of Whiffen's brand, warehoused in March 1885, sold ¾d 11 to 1 ⅞d; and 12,000 oz. of Zimmer's quinine, warehoused in 18-8, realised 9⅞d per oz.; this beating the previous lowest quotation on record. Howard's quinine is quoted by the makers at 1s 2d to 1s 3d in bulk, and 1s 4d to 1s 5d for bottles. The quotation for New York comes at 20 cents per oz. A sale of 10,000 oz. German bulk was reported on Tuesday at 10⅛d per oz. The arrivals of quinine in New York are falling off somewhat as compared with last year. From January 1st to March 31st they were:—In 1891, 870,520 oz.; 1890, 1,078,400 oz.

MANA GRASS EXPERIMENTS—OPIUM, MALARIA AND QUININE—THEAFOAM—ZAMBESI COMPANY AND MR. H. S. SAUNDERS—CROCODILE, IGUANA, SNAKE AND BUFFALO SKINS.

London, April 24.

Twenty-two hundredweight of mana grass has just reached the Wrightson-Stanley Syndicate from Ceylon. A letter by Dr. Norman Evans has been shown to me wherein that gentleman strongly recommends that laboratory investigation should first be conducted with samples of this fresh shipment before the expenditure of factory treatment be incurred; for, Dr. Norman Evans has written "if it is as harsh as the last large delivery, it would be a waste of money to try and boil it with water alone." Some delay may therefore occur before it will be possible for me to write you as to whether our hopes of the ultimate utilization of mana grass for coarse papermaking are to be fulfilled or not. It is unfortunate that in the interval which has passed since I reported the experiments conducted at the Poyle Mills, the proprietor of those mills, has had to wind up its concerns. The experience Mr. Ibotson had gained on that occasion would have otherwise been of great value in the further sets of experiment we hope to be tried; although no doubt other mills exist at which these can be satisfactorily carried out.

The following extract from the *Echo* contains prominent reference to the letter which Mr. John Ferguson addressed to the Anti Opium Society on the question which has lately received such disagreeable prominence in the House of Commons. We are wondering if the initials signed to this communication, W. W. G., can be a misprint for W. H. G., and if it can be due to the pen of Sir William Gregory. You may, however, recognize the individuality of the writer under the initials given.

(13,003) OPIUM.—"Chesham Jacko" will find a genuine blend of quinine taken in place of the opium will remove in a short time the depressed, weak feel-

ings, and ultimately remove entirely the craving for opium. Moreover, the strong tonic principles of quinine will soon rebuild his constitution, and restore life and vitality to his system, which has no doubt been somewhat undermined. There is a splendid blend of quinine known in the trade as "Quinine Pick-up." I cannot give him the name of the makers, but no doubt any respectable firm of medicine agents would direct him. It is reported that 1,500,000 deaths take place annually throughout India from fever alone, causing a heavy demand for some drug to allay the feverish sufferings, and opium is freely resorted to in numberless cases, the use of the article being thus commenced. The fact of so many lives being lost each year by fever is a disgrace to civilisation, when it is well known that quinine is the finest antidote and almost invariable cure for fever and ague. A missionary recently home from India informed me that it is fearful to see the sufferings and fatal results from fever, and that he had found his religious work considerably assisted by alleviating the Indians' sufferings from a supply of quinine forwarded to his mission. Some time since, Mr. Ferguson, in a letter to the Anti-Opium Society, described the prevalence of opium-craving in many parts of the world being due to a low type of fever, especially in China. He considered the main cause of the craving arose from people living in low malarial localities, and suggested that quinine removes the craving and acts as a substitute. Touching the opium question, an authority writing in the year 1880 made the following statement:—"From the vast tracts of country in China where rice is cultivated fever is never absent, opium, being employed as the medicine easiest to be had, and cheapest. He hoped if quinine became cheap enough to compete with opium, that it would produce a revolution in the Chinese consumption of the two drugs. By this process a solution would be found for the dangers, and uncertainties of the large opium revenues of India, and for the perplexing moral questions connected with it." At a time the above was written (in 1880) the price of quinine was practically prohibitive—viz., 11s to 11s 6d per oz., but today it can be freely purchased at 10d or 10½d per oz for foreign brands, and 1s 4d or 1s 5d per oz. for English, being almost the very lowest prices ever known in the history of the article.—*W. W. G.*

My reference to the foregoing matter suggest me to allude here to the course which has followed Sir John Pease's snatched division in the House of Commons on his motion for abolishing the Indian Opium Traffic. Doubtless the complete surrender of that gentleman—which was in accord with my own prediction—will have been wired to you by Reuter, and you will have made your own comments upon it in advance of your receipt of my former remarks on the subject. It will, however, interest you to have some details as to what passed in the House on the occasion of this surrender, to which we here attach much importance on account of the bearing it may possess on the somewhat similar case of the demand for the surrender of your paddy tax.

Some short time back you were told by me of the new drink manufactured from tea and called "Theafoam." A company for the manufacture and sale of this has been just registered with a capital of £10,000 in £1 shares, the declared object of "Theafoam, Limited" being to "manufacture and sell preparations of tea and coffee, ærated tea and coffee, ærated waters, &c." With this letter is sent a copy of the prospectus of the new company, and you will find with it copies of many testimonials received which include one by Cardinal Manning, another by the well-known Dr. Richardson, and by many other persons associated prominently with the Temperance cause. The list also includes an extract from the *Tropical Agriculturist* giving the opinion expressed by myself after testing the new beverage. All tea growers must wish the new company a success.

After receiving the *Observer* containing my letter referring to this processes for preserving crocodile leather and that containing your editorial on the same subject, I paid a second visit to Messrs. Toulmain & Gale. In the course of conversation the question was put by me whether the skin of the cabragoya would make good leather. Mr. Toulmain replied that he very much doubted it, as they had tried iguana and chameleon skins and found them to be worthless. He said that many of these larger lizard skins had really two layers, the upper one of these having quite a steely character, so much so, indeed, that it would spring away from the under layer when touched by the paring knife. He told me also, that, as with the hides of commerce, the quality of crocodile skins varies considerably. Some skins in the same shipment have a very fine quality, while others prove to be so coarse as to be unfit for their—the finest—uses. He further said that all the Russia leather his firm so largely works up is prepared from the hide of the Russian buffalo, and that the skins of that creature are often worth four times as much as those of the buffalo in any other part of the world. I told Mr. Toulmain that I saw the Ceylon buffalo hides scarcely ever fetched the price that Italian and Mexican hides obtained, and he replied that he thought it very possible that the coarseness of the skin might be due to climate or to character of feed; but he could not say what peculiarity caused the hide of the Russian buffalo to have such an exceptional value. He observed, however, that the Russian hides are the finest, softest, and most pliable that reach the London market. On my asking whether snake skins were readily saleable, he remarked that the contrary was the case, that people had a "creepy" feeling about snakes and did not buy ornaments made from their skins freely. "The consequence is," he went on, "we can now buy any quantity of ready tanned snake skins in London at a less price that is demanded for them by shippers abroad. The market is quite glutted with them."

NOTES ON PRODUCE AND FINANCE.

AERATED TEA AND COFFEE.—The prospectus is issued of a new company called "Theafoam," Limited. The capital of the company is £10,000 of £1 shares, and the object, according to the prospectus, is to acquire and develop the patent rights for "improvements in the manufacture of concentrated preparations of tea and coffee and of aerated tea and coffee," the provisional specification for which, dated June 6th, 1890, lodged by Messrs. Leonard Butler Wrightson and James Arthur Philips, and numbered 8770, has been accepted; and also to acquire the registered title and trade mark "Theafoam." The prospectus goes on to say;—Messrs. Wrightson and Philips have for some considerable time past given their attention to the production of pure tea and coffee in an aerated form, as being beverages most likely to fulfil these requirements. After repeated trials extending over several years, and involving considerable expense, they have at length succeeded in perfecting a product which they have named "Theafoam," and which they believe amply fulfils the above conditions, and therefore the requirements essential to success. "Theafoam" can be offered at a price within the reach of all. It is a genuine tea preparation (aerated), unmistakably retaining the peculiarly pleasant and well defined flavour of the finest teas. The difficulties of keeping tea in solution with aerating gas, whilst preserving the freshness and fragrance so desirable, have until now been insurmountable. No injurious flavouring or essences are used in the manufacture. "Theafoam" is prepared from the leaf itself by a novel process, the form it

first takes being that of a "Tea Extract" from which the aerated tea is subsequently made. To many persons ordinary cold tea, although its supporting qualities are admittedly great, is considered unpalatable. "Theafoam" is, on the other hand, a fragrant, palatable, sparkling, refreshing and non-intoxicating drink. The "Tea Extract" is also patented, and will doubtless be recognised in this country and abroad as a ready and valuable time-saving agent for making tea at hotels, railway stations, buffets, &c.

COFFEE CULTIVATION IN THE SOUTH PACIFIC.—The *Fiji Times* is advocating the revival of the coffee enterprise in Fiji. It says coffee was almost abruptly abandoned before it had received a fair trial on anything like a comprehensive scale, and might well come to the fore. Notwithstanding the effects of the disease to which it is subject, there can be no doubt that it can be made a highly profitable production. Fiji need not look far for assurance in this respect. Her near neighbour, New Caledonia, is making a success of it.

TEA COMPANIES REPORTS, 1890.

There is food for what we may perhaps be allowed to call "comparative reflection" in the reports issued by our London tea companies (whether Indian or Ceylon). There are both the question of the result obtained and that of the form and amount of the information furnished to shareholders which deserve attention, and it may perhaps be permitted to us in this place to make a few remarks, which at any rate may be the means of directing notice—more has been done hitherto—to these points. In doing this we shall allude *seriatim* to the companies' reports as they reach us.

The Ceylon Tea Plantations Company issues this year a handy little report, and as results are good, shareholders, will probably take it as read and give a vote of confidence to the directors and managers.

There is, however, a painful absence of the detail to which we are accustomed in most India tea companies reports in a profit and loss account, with a single item at its credit:—Net profit on sale of produce, £30,284 2s. 11d.; and, as pointed out by our market correspondent, we would feign ask for some information as to the gross figures, of which this large sum is the resultant, as well as what actual cost of production per lb. of produce, amounts to. There is also no clue as to what amount of the company's acreage is mature and immature.

From this rather meagre report (good though results are) we turn with some degree of pleasure to the two reports issued respectively by the Lungla and Shumshernugger Companies, both young Sylhet concerns, working on progressive lines. These reports, as pointed out by our Share Market correspondent, leave nothing to be desired in point of clearness and detail. We find clear statements in the report itself of:—

Comparative produce out-turn and estimate.
Yield per mature acre of cultivation.
Average price realised.
Particulars of mature and young planted area.
Comparative cost of production (showing also the effect of exchange on the company's cost.)
Statement of labour force.
Detailed estimates for 1891 and estimated cost per lb. of production.

The accounts show firstly on the credit side the gross realisations of the produce, while on the debit all expenditure is given in detail, classified under the three headings of Garden, Calcutta, and London, distinguishing in this last the charges as tea sales from other expenses.

Of office expenses and directorial and other central charges, these companies appear to live in that happy ignorance which is characterised as "bliss!" The profit and loss account is stated in a sensible way, the undivided balance not being carried to any special reserve account, but merely carried on in revenue account, so that it can be availed of in future years for equalisation of dividends, and used meantime for working capital.

An excellent account sale of the produce is appended, while the last page contains a list of the shareholders, which is, though a novel, a very excellent feature, especially as in neither case do they need to be ashamed in any way of their holding.

We must defer till our next issue remarks and reports upon the following, which are also in our hands:—
Chubwa and Nonoi.
Borokai and Indian of Cachar.
—*H. and C. Mail.*

CEYLON TEA PLANTATIONS COMPANY, LIMITED.

CEYLON.—I.

Offices, 21, Mincing Lane, London, E. C. Directors: David Reid, Esq., Thomaneau, Kinross-shire, chairman; Henry Tod, Esq., 21, Mincing Lane; David Reid Esq., 7, Mincing Laue; H. K. Rutherford, Esq., managing director. Secretary: Sir W. Johnston, Bart. Manager in Ceylon: G. A. Talbot, Esq.

The following is from the report of the directors to be submitted at the fourth annual general meeting of shareholders, to be held at Winchester House, Old Broad Street, E.C., on Wednesday next. The directors have the pleasure to submit the general balance-sheet and profit and loss account for the year ended Dec. 31st 1890, duly audited. The net amount at credit of profit and loss account, including balance brought forward at Dec. 31st 1889, and after providing for general expenses, directors' fees, income tax, &c., is £31,216 0s 1d; which has been apportioned as follows:—An interim dividend of 7 per cent was paid on Oct. 27th 1890, £9,223 18s; it is proposed to pay a final dividend of 8 per cent making 15 per cent in all, (free of income-tax) which will absorb £10,541 12s; it is proposed to pay a dividend of 15 per cent on the new issue of ordinary shares (free of income-tax), which will absorb £984 9s 3d; a dividend on the issue of 7 per cent preference shares was paid on Dec. 31st, 1890, £524 5s 7d; to write off for depreciation on office furniture, £10 15s 9d; to write off for depreciation on buildings and machinery, £4,000; to add to reserve fund, £5,725; and to carry forward to next year a balance of £205 19s 6d; total, £31,216 0s 1d. The directors are pleased to be in a position for the fourth consecutive year to declare a total dividend of 15 per cent on the ordinary shares of the company. After writing off £4,000 for depreciation on buildings and machinery, and providing for a furlough account, to the extent of £1,750, and carrying forward a balance of £205 19s 6d., a sum of £5,725 has been added to the reserve, bringing that fund up to a total of £9,000. The above result may be considered satisfactory, as the rate of exchange was 12 per cent less favourable for the company's business during the year than in 1889. The gross average realised for company's teas sold in London was 11d per lb. being the same as for the previous year, and the yield from mature and immature plants averaged 387 lb. per acre over a plucking area of 3,947 acres. The tea crop compared with that of last year, was as under:—

Year.	Company's Estate Teas. Lb.	Tea made from leaf purchased Lb.	Tea manufactured for others. Lb.	Total. Lb.
1890...	1,528,491	598,427	838,237	2,965,155
1889...	937,407	799,779	277,149	2,014,335

The Board has steadily had in view the acquisition of good properties at high elevations, the tea crops of which can be economically manufactured in the company's existing factories, and with this object has since the close of the year, acquired the West Holyrood, Ardallie, and Rathnillokelly Estates, all situated in the Dimbula District. In order to provide for the purchase of the above-named estates, the directors contemplate, with the approval of the shareholders, making a further issue of share capital, at a premium to be afterwards deter-

mined. The company's properties with these recent purchases consist of the following:—Tea planted, 6,307 acres; tea proposed to be planted this year, 688 acres; coffee, 93 acres; jungle and planted timber, 1,693 acres; patena and waste land, 357 acres; total 9,138 acres. It is gratifying to the directors to be able to inform the shareholders that the chairman's visit to Ceylon has given them increased assurance, not only of the value of the company's properties, but also of the thoroughly satisfactory manner in which the estates and business of the company are managed by the Ceylon manager and his staff. Under clause No. 69 of the articles of association, Mr. David Reid, of 7, Mincing Lane, retires on this occasion from the board, but, being eligible, offers himself for re-election. Mr. R. H. Miller, of Messrs. Harper Brothers, auditor, also retires from office, but offers himself for re-election

HUNASGERIA TEA COMPANY LIMITED.

CEYLON.—II.

Directors: John Brown, Esq., managing director; Edward Conder, Esq.; Henry Hart Potts, Esq.

The following is from the report presented to the meeting of the Company on Wednesday last:—

The following accounts are now presented to shareholders, viz.:—Balance-sheet showing the financial position of the company on Dec 31, 1890; profit and loss account for crop 1889-90. In the circular issued on Oct. 31, 1890, shareholders were informed that the date for closing the crop year had been altered from June 30 to Dec. 31. The present profit and loss account, therefore, comprises the period of eighteen months, from June 30, 1889, to Dec. 31, 1890. It will be seen from this account that the weight of tea sold during the time named amounted to 251,537 lb., the average selling price being 10d. per lb., and the proceeds £10,372 5s. 2d. The crop of Cardamoms amounted to 3,372lb., and realised £231 4s., or an average of 1s 5d per lb. Cocoa, weighing 37 cwt. 1 qr. 20 lb., was sold for £195 19s 2d, the average price being 104s 6d per cwt. The total receipts from sales of produce thus amounted to £10,799 8s 4d. The total expenditure for the eighteen months in Ceylon and London was £10,014 12s 11d, which, deducted from the value of produce, leaves a profit on crop 1889-90 of £784 15s 5d. A debit balance was brought into profit and loss account, from the previous year, of £774 5s 11d, and after writing off this sum from the above profit there remains a credit balance of £10 9s 6d to be carried forward. Looking at the tea crop figures, the yield is satisfactory. The estimate in the directors' last report for the year ending June 30th, 1890, was 150,000 lb. of tea, and the actual weight secured 150,679 lb. This weight of tea was sold at an average price of 9½d per lb., the result being that the twelve months' working did not do much more than cover expenses. The crop the following six months, however, showed a material increase, the yield for the half year being 100,948 lb., which sold at an average of nearly 10½d. per lb. It was during this half-year that nearly the whole of the above profit was made. A considerably larger profit would have resulted from crop 1889-90 had it not been that during the last half of the past year a sharp rise took place in silver, owing to speculation consequent on American legislation; the rise in exchange, while it lasted, added about 20 per cent. to the cost of working the property. The price of silver has now relapsed to about its former value, and the directors have no anxiety as to exchange with regard to the present crop. Mr. Brown, the managing director, has recently visited the estate, and writes that the tea promises well, and especially so when increased crops allow manuring operations to be more freely undertaken. The estimates for the current year, 1891, are tea 225,000 lb., cocoa 30 cwt., and cardamoms 1,250 lb. The area of tea planted on the company's estate remains as follows:—Over 5 years old, 510 acres; planted July-Oct., 1886, 86 acres; 1887, 124 acres; 1888, 40 acres; total under tea, 760 acres. Mr. H. H. Potts, a member of the Board, retires from office on this occasion, and being eligible, offers himself for re-election. The directors have decided to forego their fees for the past 18 months.

At the meeting of the Company on Wednesday Mr. E. Conder presided, and, in moving the adoption of the report, stated that when the prospectus was issued the liquidator of the old company took £18,600 in shares, so that the public had applied for about 4,100 shares, of which number one of the directors took one-third. The total area under cultivation was 730 acres, and by the addition of buildings and appliances they were now able to manufacture a very large quantity of tea. They had thought it wise to buy an engine and a boiler, as they could not always depend on waterpower to drive the machinery. For the first time the balance-sheet showed a profit, which would have been larger had it not been for the sharp rise that took place in silver. For the year 1889-90 their produce had been 150,679 lb. of tea; but in the last half of the last year their improvement was still better, and they went up to 100,948 lb. They were also getting 10½d. a lb., as against 9½d in the former year. Mr. H. H. Potts seconded the motion. In answer to questions, the Chairman said they did not want to issue debentures. The total cost of the engine and boiler would be about £300, which was proposed to be paid out of the revenue for the year. They had thought it better to go in for quantity rather than quality, and were to present making a profit at the rate of about £200 a month.

The motion was carried, and the retiring director and auditor were re-elected.—*H. and C. Mail*, April 24th.

SALE OF ESTATE PROPERTY.

Arslena estate, in Lower Dikoya, or Kelani Valley, has been purchased by Mr. C J. Backhouse of Dikoya from Mr. T. C. Anderson for £6,500 stg. The estate consists of 220 acres of tea in full bearing, and 30 acres lately planted, with about 80 acres forest. A fully equipped factory is on the property, which yields 100,000 lb. of tea per annum. So the price may be considered a bargain for the purchaser.

A half share of St. Leys estate, in Dikoya, has been purchased by Mr. J. W. Holt, the proprietor of the other half, from Mr. T. C. Anderson for about £3,000 stg. The estate consists of 130 acres tea in full bearing.

TEA PROSPECTS AND "WHAT TO DO WITH OUR BOYS?"

"Paterfamilias" writes:—

"I have no less than *five* boys at ——— school; now two of whom are just finishing and the question is what should they do? If I could only have bought estates for them even a year ago I think a little would have gone a long way in giving them a good start in life. I fear the time is rapidly passing away when tea land can be had cheap: we are fast getting to the real value of tea property in Dimbula. It is only beginning to dawn on people here, how very valuable an acre of tea land is in a district where ten years' purchase cannot be looked upon as too high! It is really hardly ascertained yet by experience what the best land will yield; the best soil held longest and in coffee and has but recently been planted in tea hence it is, at all events not generally known what the yield will be on such places. I say nearer 600 lb. per acre THOUSAND lb.

"WALKER, SONS & CO., LIMITED."

It was to many in Ceylon a matter of regret that the old name of "John Walker & Co.," should have disappeared when the business so long associated with the name had to be formed into a

Limited Company. But there was no help for it; because in registering in London, there was no room to register as a Company, a name already on the roll. Various other forms of the name were attempted, but without success; and at last it had to be "the Colombo Ironworks, Limited" in order not to delay business. But no one cared for a name without any personality and few of the old customers ever used it—"John Walker & Co." or "Walker & Co." was the address on nearly every letter, or every reference! Fortunately therefore—as we learn from a circular issued in London by Mr. Frank Walker as Secretary to the Company —another and satisfactory, because expressive, title has been found and registered, namely Messrs. Walker, Sons & Co., Limited, under which title, we wish all success to the old Firm and new Company.

NOTES ON POPULAR SCIENCE.

By DR. J. E. TAYLOR, F.L.S., F.G.S., &c.

EDITOR OF "SCIENCE GOSSIP."

Two French botanists have discovered that the stems of potatoes from various parts of France are attacked by *gangrenes*, and that the latter appear to be caused by the presence of enormous numbers of bacteria in the diseased cells. Similar *gangrene* diseases produced by the same group of micro-organisms have been found in hyacinths, pelargoniums, and other highly educated and abnormally developed horticultural plants. The animal and vegetable kingdoms are growing nearer every day, not farther apart by virtue of their suffering from the epidemical and destructive effects of the same lowly organised and innumerable class of parasitic plants.

All vine-growers are interested in the natural history of the phylloxera, that underground mite which attacks the vine in its most succulent part, the root and rootlets. Its ravages are increasing in the vine-growing regions of the old world, especially in the Italian vineyards. A new fact in its natural history, however, has just come to light. It is stated that the mere perforation of the rootlets by the phylloxera is not the direct cause of the destruction of the vines, but that the latter is due to parasitic fungi which take advantage of the lesions produced by the insects. If this be the case, the top-dressing of veneyard soils with iron sulphate ought to be more resorted to than ever.

The cross-fertilisation of flowers has assumed a new interest since the publication of the two famous books by Darwin and Hermann Muller. Mr. Scott-Elliot has recently shown that in Natal the sun-birds (which in South Africa take the place of the humming-birds * of America) are the usual fertilisers of the banana. These brilliant birds are great flower-frequenters, and they generally visit only one species of flower at a time.

Australia possesses many species of arum. One of them goes by a very opprobrious name, which I may freely translate as "stinkplant." All the arums smell vilely, in whatever part of the world we find them. It has been just discovered here that the fertilisation of arums is mainly effected by carrion-loving coleoptora (or beetles), which are attracted by the nasty odours. In this work, however, they are joined by blue-bottle and other flies.

When in Australia I noticed and wrote about the influence which gall-insects had upon the leaves of the blackwood (Acacia melanoxylon), and attributed the change of their shape to their reversion to an ancestral state (atavism). Two distinguished German botanists have just demonstrated that the heteromorphism of the leaves of oak and beech, when injured unduly by cold or insects, assumes ancestral or atavic forms and shapes.

A German chemist has once more analysed the diamond. The process is a costly one, and therefore must be a careful one. The result confirmed the experiments made before (they are extraordinarily few), that the diamond is chemically identical with carbon, since not only is the atomic weight the same, but on oxidation, both yield exactly the same product.—*Australasian.*

* As they do in Ceylon.—ED. T. A.

ANALYSIS OF THE ORANGE.

The Boston Journal of Chemistry publishes the following result of the analysis of a medium size orange, purchased in Faneuil Hall Market:

The skin weighed 97.5 grams. which is 23.33 per cent.
The seeds weighed 7 grams, which is 2.84 per cent.
The pulp weighed 182 grams, which is 83.83 per cent.

The skin contained in 100 parts: Water and volatile oil, 78.00; organic matter, 21.36; ash .64.

The seeds contained in 100 parts; Water, 50.00; organic matter, 48.64; ash, 1.36.

The pulp contained in 100 parts; Water, 90.90; organic matter 8 68; ash, .33.

The pulp contained in 100 parts: Grape sugar, 4.3; cane sugar, 4.2; in free acid, 1.0.

The free acid consisted of about equal parts of malic and citric acid.

The ash constituents of the orange were as follows: Potash, 38.7; soda, 7.6; lime, 23.0; magnesia, 6.5; ferric phosphate, 1.7; sulphur, 2.9; silica, 6.2; phosphoric acid, 14.1

It will be seen from the analysis that lime and potash are the principal elements of the ash, and hence that any fertilizer to be a complete orange tree food must contain a large percentage of these elements mentioned and also the other chemicals mentioned in the analysis in the relative proportions.—*Florida Agriculturist.*

ECHOES OF SCIENCE.

According to the Russian traveller, M. Grum-Grzimailo, the oasis of Turfan, in Tian-Shan, Central Asia, is a desert, once the bed of a great lake, which has been reclaimed by man with extraordinary labour. It has no water, and the inhabitants have excavated a system of underground canals and wells, some 300ft. deep, to irrigate the soil. These canals collect the underground water and convey it to the surface in the lower lands. The works are so colossal that the members of the exploring party could only compare them with those of ancient Egypt.

At a recent meeting of the Royal Geographical Society, Mr. A. E. Pratt described a journey of his in Ta-tsien-lu, South-West China, during which he ascended the sacred mountain of Omei. It is 11,100 feet high, and supports nearly eighty temples. On one side there is an immense precipice, about 1·3 miles in height, from the edge of which Mr. Pratt witnessed the phenomenon called the "Glory of Buddha." Looking down into a sea of mist which filled the valley below, he saw, about 150 feet beneath him, the golden disc of the sum surrounded by rings of rainbow-coloured light. This effect is the great marvel of Mount Omei, and the proof of its peculiar sanctity. Every year many pilgrims commit suicide by throwing themselves over the cliffs.

Lord Howe Island, situated about 300 miles from Port Macquarrie, is marked out as a future sanatorium for the Australian colonies. It is seven miles long, by a mile wide, and contains basaltic mountains 3,000 feet high. The soil is fertile, and covered with vegetation; the scenery is beautiful, and the climate cannot be surpassed. It is likely to become a holiday resort very soon, the sea voyage not being too long, yet long enough to benefit the health. There is a banyan tree on the island covering six or seven acres, and only smaller than the famous one between Poonah and Kolaporo.

The recent bulletin of the American census announces that the ratio of land to water surface in the United States is 98·16 to 1·84. The average number of inhabitants to each square mile of land is 21·08 If, however, the whole teritory were as thickly inhabited

as Rhode Island is now, the population of the Union, instead of being over 62 millions, would be nearly 946 millions or about two-thirds of the entire population of the world. The United States are capable of supporting 1,000 millions or more.

A company has been formed for the construction of a canal between the Black Sea and the Sea of Azov. It will have a length of 75 miles, and a breadth of 73 feet, with a depth of 13½ feet, increasing to 16 feet at both ends. Six years are allowed for its completion. We may add that the Isthmus of Corinth Canal is expected to be finished in 1883.—*Globe.*

EARLY FLOWERING OF COCONUT TREES,—A few of the coconut palms planted amongst the tea on Eilandhu estate, a few miles south of Henaratgoda, have flowered, although they were only planted out in 1887! But too much must not be made of this fact. The plants were originally of high quality and they were placed in large holes dug in soil which had already undergone considerable tillage and manuring. Then the precocious plants in question are situated near the tea house, and have been forced into premature bearing by liberal applications of ashes from the furnaces of the drier and the steam engine, and other manurial substances. In the case of ordinary plantations, we believe we are safe in saying that although a certain proportion of the trees will bear in the seventh year, and perhaps one half in the fourteenth, the whole plantation will not be in full bearing much under the round score years from date of being put into the field. Then, the popular estimate for bearing is sixty years—sixty years for the existence of the tree is too low,—and one of our shrewdest and most experienced coconut planters is of opinion that, properly tended and liberally manured, it is not possible to place a limit on the bearing life of the palm.

JUNGLE FOWL AND CACKLING.—We draw attention to another letter from *Nature*, in which Mr. V. Ball, the veteran Anglo-Indian Geologist, expresses opinions, the result partly of personal observation which renders the question still more perplexing. For, only the other day we had the express testimony of an old planter, the result of personal observation, to the effect that the domesticated barn-door fowl never cackles when it lays an egg in forest, jungle or away from home. The quiet around affords no encouragement to cackle —for only as it lays at home, does it indulge in cackling! These facts may be of some use to Mr. Romanes; he may be able to experiment with the domestic hen in the woods of the old country. Here is the letter from the latest number of *Nature*:—

CACKLING OF HENS.

It is often difficult to recall an actual instance of what may be a matter of very common occurrence. Such is to a certain extent the case with the subject to which Prof. Romanes's query in *Nature* of April 2 (p. 516) refers.

In a general way it is my impression that the cackling of jungle fowl is not very commonly heard in India, but I feel certain that I have heard it occasionally, and that I once did hear it upon a somewhat considerable scale is impressed very distinctly upon my memory by certain and special circumstances. My tent for a few days in April 1876 was pitched close to a perfectly impenetrable patch of thorny jungle in Orissa. This cover was full of jungle fowl, and I remember hearing the cackling of the hens, which reminded me of the familiar farmyard sounds of home. It is possible that in this case the safety of their retreat may have had something to do with their not fearing to cackle with unusual vigour.

V. BALL.

Science and Art Museum, April 18th.
—*Nature*, April 23rd.

INDIAN PEKOE SOUCHONGS.—"Peripatetic Planter" writes to *Indian Planters' Gazette* from London as follows:—As regards Indian Type (pekoe souchongs) it is openly proclaimed by some, that those will pass the shilling before long! More's the pity, again—a short life and a merry one is not the ideal of those with a permanent stake in the industry. All kinds of sensational rumours are afloat about these pekoe souchongs—one of the baneful effects of their adoption by the Clearing House, or Commercial Monte Carlo. It is said, that very large transactions in this class have been privately effected, within the past few days, (10,000 chests and 20,000 chests are variously mentioned in the rumours referred to) and *large* catalogues of the past fortnight's auctions (on Garden or Company Account) are pointed out with scarcely a single line of pekoe souchongs in them by way of partial corroboration of the statements. This looks like the commencement of a corner, but that I know large importers who have not yet been approached with any private offers for this special class of tea; and to establish a corner successfully, would almost demand a *very rapid* grabbing of the greater proportion of the class. Hence, the opinion is reasonable, that the transactions are (1) either mythical, or (2) the sporting act of private speculators, and not of a really heavily capitalised group of speculative financiers. In any case, we are having the first taste of those baneful results which I predicted when the adoption of an Indian Type by the Clearing House was first talked of.

CEYLON EXPORTS AND DISTRIBUTION, 1891.

COUNTRIES.	Coffee cwt.			Cinchona.	Tea.	Cocoa.	C'moms.	Cinnamon.		Coconut Oil.		Pl'bago.
	Plantation	N'tive	Total.	1891 B'nch &Trunklb.	1891 lb.	cwt.	lb.	Bales lb.	Chips lb.	1891 cwt.	1890 cwt.	1891 cwt.
To United Kingdom ...	23960	...	23960	1807449	24795526	9973	58641	397893	32129	32150	...	55260
" Austria	4121	16	4137	..	230	...	...	2100	3370	6943	1200	...
" Belgium	18	..	18	53704	85	...	...	10000	...	804	...	3094
" France	...	33	33	3362	9091	39	...	61900	...	2300	...	...
" Germany	2	...	2	...	14969	77	1141	112975	43120	5338	501	9574
" Holland	...	...	...	21438	...	...	...	...	...	...	10	...
" Italy	35	...	35	...	124	...	...	46200	42000	203	696	...
" Russia	...	...	...	...	..	...	...	...	...	1001	99	...
" Spain	...	...	...	..	3800	...	...	36000	...	...	...	...
" Sweden	...	...	...	...	300	..	...	...	...	...	...	...
" Turkey	...	...	...	...	...	...	...	...	...	...	...	...
" India	972	1820	2792	...	58635	...	66462	20912	...	41050	18464	10
" Australia	2482	347	2829	...	904259	...	40	2700	4480	603	1029	...
" America	154	...	154	141545	46390	1215	..	12000	...	34349	14026	70764
" Africa	35	...	35	...	20698	...	...	...	...	...	...	...
" China	21	...	21	...	29832	...	...	20368	...	1033	121	...
" Singapore	15	...	15	...	1136	84	...	...	...	58	1703	...
" Mauritius	...	...	...	...	...	...	...	...	...	...	24340	...
Total Exports from 1st Jan. to 18th May 1891	31815	2216	34031	2027498	25885075	11388	126284	723048	125099	125832		138702
Do 1890	46134	1351	47485	3150777	16191050	8495	151332	579564	131584	62189		150677
Do 1889	29037	2796	31833	4017254	12456721	7535	138325	1050283	232765	114916		155969
Do 1888	70886	1795	72781	4647379	7116209	7641	146904	403149	351385	147512		91490

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current London, April 23rd, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS
ALOES, Socotrine	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic	Common and good ...	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red...	Renewed	2d a 1s
	Medium to good Quill...	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a 1½d
BEES' WAX, E.I., White	Good to fine	£6 10s a £8 10s
Yellow ...	,, ,, ...	£6 a £7
Mauritius & Madagascar...	Fair to good	£6 10s a £7
CARDAMOMS—		
Allepee	Fair to fine clipped ...	1s a 2s 2d
Mangalore	Bold, bright, fair to fine...	1s 6d a 3s
Malabar	Good to fine plump, cliped	2s a 2s 6d
Ceylon. Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s a 1s 6d
	Small to bold brown ...	1s a 1s 6d
Alleppee and	Fair to fine bold ...	2s 6d a 3s 11d
Mysore sort	,, ,, medium ...	1s 6d a 1s 10d
	,, ,, small ...	1s a 1s 4d
Long wild Ceylon...	Common to good ...	6d a 2s 2d
CASTOR OIL, 1sts	White	4½d a 4⅞d
2nds	Fair and good pale ...	3d a 3½d
3rds	Brown and brownish ...	2¾d a 3d
CHILLIES, Zanzibar ...	Fair to fine bright ...	65s a 70s
	Ord'y. and middling ..	55s a 62s 6d
CINNAMON, 1sts	Ord'y. to fine pale quill...	7½d a 1s 2d
2nds	,, ,, ,, ,, ...	7d a 1s
3rds	,, ,, ,, ,, ...	6½d a 10d
4ths	,, ,, ,, ,, ...	5¾d a 7d
Chips	Fair to fine plant ...	2d a 6½d
CLOVES, Zanzibar and Pemba.	Fair to fine bright	3¾d a 4d
	Common dull and mixed	3¼d a 3½d
,, STEMS	Common to good ...	⅞d a 1d
COCULUS INDICUS ...	Fair sifted	12s a 13s
COLOMBO ROOT... ...	Good to fine bright sound	22s 6d a 28s 6d
	Ordinary & middling ..	16s a 20s
CROTON SEEDS, sifted...	Fair to fine fresh ...	10s a 15s
CUTCH	Fair to fine dry ...	24s a 32s 6d
DRAGONS BLOOD, Zanzibar ...	Ordinary to good drop ...	50s a 90s
GALLS, Bussorah & Turkey ...	Fair to find dark bluo ...	52s 6d a 57s 6d
	Good white and green ...	40s a 50s
GINGER, Cochin, Cut ...	Good to fine bold ...	70s a 75s
,, ...	Small and medium ...	41s a 52s
Rough...	Fair to fine bold ...	32s 6d a 40s
,, ...	Small and medium ...	25s a 30s
Bengal, Rough	Fair to good	19s
GUM AMMONIACUM ...	Blocky to fine clean ...	50s a 90s
ANIMI, washed ...	Picked fine pale in sorts,	£11 a £13
	Part yellow & mixed do.	£10 a £11
	Bean & Pea size ditto ...	£5 a £7 10s
	Amber and red bold ...	£10 a £12
	Medium & bold sorts ...	£6 10s a £11
scraped...	Good to fine pale frosted	
ARABIC E.I. & Aden ..	sifted	60s a 80s
	Sorts, dull red to fair ...	35s a 55s
Ghatti ...	Good to fine pale selected	45s a 55s
	Sorts middling to good...	23s a 33s
Amrad cha.	Good and fine pale ...	65s a 107s 6d
	Reddish to pale brown ...	25s a 50s
Madras ...	Dark to fine pale ...	15s a 50s
ASSAFŒTIDA	Fair to fine pinky block and drop	35s a 80s
	Ordinary stony to midling	20s a 28s
KINO	Fair to fine bright ...	40s a 43s
MYRRH, picked	Fair to fine pale ...	£6 a £8
Aden sorts	Middling to good ...	70s a 80s
OLIBANUM, drop...	Fair to fine white ...	35s a 56s
	Reddish to middling ...	22s 6d a 32s 6
,, pickings...	Middling to good pale ...	12s a 18s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER	Red hard clean ball ...	2s 4d a 2s 6d
	White softish ditto ...	1s 8d a 2s 3d
East African Ports, Zanzibar and Mozambique Coast	Unripe root	1s 3d a 1s 11d
	Liver	1s 6d a 2s 2d
	Sausage, fair to fine ...	2s a 2s 2d
	Good to fine ...	2s a 2s 8d
Assam,	Common foul & middling	1s a 1s 10d
Rangoon	Fair to good clean ...	2s a 2s 3d
Madagascar, Tamatave, Majunga and Nossibe	Good to fine pinky & white	2s 4d a 2s 8d
	Fair to good black ...	1s 10 a 2s 2d
ISINGLASS or FISH MAWS Tongue..	good to fine pale ...	3s a 3s 10d
	dark to fair ...	1s a 2s 6d
Bladder Pipe...	Clean thin to fino bold...	1s 6d a 3s 7d
Purse ...	Dark mixed to fino palo	6½d a 1s 6d
Kurrachee Leaf ...	Common to good pale ...	1s 9d a 3s 10d

EAST INDIA *Continued* East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS
INDIGO, Bengal ...	Middling to fine violet ..	4s 6d a 5s 10d
	Ordinary to middling ...	3s 6d a 4s 3d
Kurpah	Fair to good reddish violt	3s 3d a 3s 8d
	Ordinary and middling...	2s 3d a 3s 1d
Madras (Dry Leaf).	Middling to good ...	2s 6d a 3s
	Low to ordinary ...	1s 8d a 2s 3d
IVORY—Elephants' Teeth—		
60 lb. & upwards ...	Soft slightly def. to sound	£69 a £76 10
over 30 & under 60 lb.	,, ,,	£64 a £72
40 a 100 lb. ...	Hard ,, ,,	£49 10s a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,, ...	Hard ,, ,,	£25 a £33 10s
Billiard Ball Pieces 2¼ a 3¼ in	Sound	£78 10s a £88 10s
Bagatelle Points ...	Sli. def. to fine sound ...	£66 a £75
Cut Points for Balls	Shaky to fine solid sd....	£55 a £73
Mixed Points & Tips...	Defective, part hard ...	£31 a £53 10s
Cut Hollows ...	Thin to thick sli, def to sound	£30 10s a £57
Sea Horse Teeth— ⅔ a 4½ lb.	Crvd. crkd & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Bhimlies I, good & fine pale	13s a 14s 6d
	,, II, fair pickings	9s 6d a 11s
	Jubblepore I, good & fine pale	12s 6d a 14s
	,, II, fair rejections ...	9s 6d a 11s
	Vingorlas, good and fine	9s 6d a 12s
Madras, Upper Godavery	Good to fine picked ...	11s 6d a 13s
,, ,, ...	Common to middling ...	9s 6d a 11s
Coast	Fair	10s 6d a 11s 6d
Pickings ...	Burnt and defective ...	8s 6d a 10s
MACE, Bombay ...	Dark to good bold pale...	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,, ...	61's a 80's	2s 8d a 3s 1d
	83's a 160's	1s 6d a 2s 7d
NUX VOMICA Cochin, Madras and Bombay	Fair to fine bold fresh	11s a 14s
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour	⅝d a ¾d
LEMONGRASS ...	,, ,, ,, ...	1½d a 1¾d
ORCHELLA WEED Ceylon ...	Mid. to fine, not wood	20s a 25s
Zanzibar ...	Picked clean flat leaf ...	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER—		
Malabar, Black sifted ...	Fair to bold heavy ...	4½d a 4¾d
Alleppee & Tellicherry	,, good ,, ...	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO, Lump ...	Fair to fine bright bold	15s a 21s
	Middling to good small...	11s a 14s
Chips ...	Sli'tly foul to fine bright	9s a 12s
Dust ...	Ordinary to fine bright...	4s 6d a 7s 6d
RED WOOD	Fair and fine bold	£3 a £3 10s
SAFFLOWER, Bengal	Good to fine pinky nominal	50s a 60s
	Ordinary to fair ...	2?s a 45s
	Inferior and pickings ..	15s a 25s
SALTPETRE, Bengal ...	Ordinary to good ...	16s 6d a 17s
SANDAL WOOD, Logs	Fair to fine flavour ...	£35 a £60
,, ,, Chips..	Inferior to fine ...	£9 a £30
SAPAN WOOD	Lean to good bold ...	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 70s
SENNA, Tinnevelly ...	Good to fine bold green..	6d a 8d
	Medium to bold green..	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a 1½d
Bombay ...	Ordinary to good ..	1d a 2d
SHELLS, M.-o'-P. ...	EGYPTIAN—med. to large	88s a 100s
	small and medium	90s a 100s
	oyster and chicken	85s a 100s
large	BOMBAY—fine thick ..	80s a 85s
medium stout ...	bright fairly clean	95s a 102s 6d
chicken part stout	,, ,, ,,	85s a 95s
oyster part thin	,, ,, ,,	70s a 82s 6d
Mussel ...	medium to fine bold	45s a 60s
	small and medium sorts	36s a 40s 6d
Lingah Ceylon ...	Sorts...	3s a 10s
TAMARINDS	Mid. to fine blk not stony	12s 6d a 15s
	Stony and inferior ...	4s 6s
TORTOISESHELL ...	Fair & fine clean heavy	16s a 25s
Zanzibar and Bombay	Low thin to mid. clean	5s a 15s
TURMERIC, Bengal ...	Leanish to fine plump finger ...	15s a 16s
Madras ...	Fin. fair to fine bold brgt	16s 6d a 18s 6d
,, ...	Mixed middling... ...	15s a 16s
,, ...	Bulbs	10s a 12s
Cochin ...	Finger	13s a 14s
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in.	12s a 20s
Mauritius, 2nds...	Foxy & reddish 5 to 8 in.	9s a 14s
Seychelles, 3rds...	Lean & dry to mid. under 6 in. ...	6s a 8s 6d
Madagascar, 4ths...	Low, foxy, inferior and pickings... ...	3s a 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for June :—

GUMMY AND RESINOUS MATTERS IN PLANTS.

GUMS may be defined as vegetable products, more or less soluble in cold water, but insoluble in ether, alcohol, and oils. They are generally obtained amorphous and most of them exude spontaneously, or on puncturing the bark. The most perfect type of this class of substances is gum arabic or acacia, which is compound of a base or bases, generally lime magnesia and potash with arabic acid. Most gums are similarly constituted to gum arabic which is an excretion from various species of acacia, especially A. arabica and A. vera. The substances known as Barbary or Morocco gum, gum Senegal' and East India gum are inferior commercial varieties of the same substance from other species of acacia.

Resins may be described as vegetable substances which are solid at the ordinary temperature, more or less transparent, inflammble, readily fusible, which do not volatilize without decomposing, are insoluble in water, but soluble in alcohol, and easily mixed with fatty substances by fusion. Liebeg described them as "oxidised essential oils."

As a common example of a resin may be mentioned rosin, the residuo left on distilling turpentine for the oil. Gum-resins combine the properties of both gums and resins—they are partly soluble in water, and partly in alcohol. A common gum resin is assafoetida got from the root of certain Umbelliferæ. Balsams, about which there has been much difference of opinion, may be simply described as solutions of resins in an essential oil.

Turpentine may be defined as an oleo-resin, generally got from pines.

Lac is a resinous substance combined with much colouring matter, produced by the puncture of the female of a small insect called the *coccus lacca* or *ficus*, upon the young branches of several tropical trees, especially the Ficus Indica, F. Religiosa, and Croton lacciferum.

Now most plants contain what are known as intercellular spaces, that is small spaces approximately tringular in shape between the cells of tissue, occuring where the walls of cells meet. These spaces are formed by the unequal development of the common cell wall in endeavouring to become round, the shape which the ordinary cell wall inclines to in thickening. As a result of this a spliting occurs along the middle of the common wall, and thus the intercellular space is formed. These spaces generally contain air, but in some cases they are filled with an exeretion, it may be mucillage as in cactus, oil as in orange and citron, or gum, resin, gum-resin and turpentine.

Among the gum producing plants of Ceylon may be mentioned Kaju (Cashew nut), Divul (Wood-apple), Hik, Imbul (Tree cotton), Kinihiriya, Welan, and Na (Ironwood); gum-resins are produced by Kekuna, Del (Breadfruit), Kos (Jak), Amba (Mango), Domba, Pol (Coconut) and Goraka; resin by Hal; lac on Keppytiya.

OCCASIONAL NOTES.

We omitted to make mention in our notice of the Grama Rakshaka Samagama's Show at Dalugama, of a locally made plough exhibited by Mr. Lobus Dharmaratne, Notary. It attracted much attention from the fact that it was of an improved type, was made in the district, and had been long used without showing signs of deterioration. On enquiry we found that the gentleman above-mentioned had some years ago seen one of the improved ploughs introduced by Mr. Green at work and being struck with the efficient manner in which it turned over the soil, was led to believe that it would be an advantage to have an implement of that kind to work up his paddy-land. In fact there is little difference between the Dalugama plough and Howard's "Cingalee," except that the share in the latter is about two inches broader than that in the former. The arrangement for the regulation of the depth of furrow is simple and convenient. There was some mistake about the cost of the plough as stated at the show, the price named there being that which was paid to the workman who was supplied with the materials. The true cost is twelve rupees, and it is marvellously cheap at the price. One of these implements has just been sent to the school of agriculture at our request for trial, and we hope to fully test its work shortly. Considering that the implement is the work of a village-smith it is a most creditable piece of workmanship.

The latest volume of "Proceedings of the Royal Physical Society" includes a paper on the classification and distribution of earthworms by Frank E. Beddard, M.A. F.R.S.E. F.L.S. Of the species allotted to the Oriental region, the following are given as occurring in Ceylon, and as having been identified in a trustworthy manner:—Perichaeta cærulea, P. affinis, P. Houlleti, P. Ceylonica, and Deodrilus Jacksoni. The insufficiently-known species found in Ceylon are given as Perichæta leucocycla, P. Viridis, P. Brachycycla, and P. Cingulata.

The *Saturday Review* is convinced that the three best oriental fruits are the Mango, the coconut, and the Durian. The Mango is lauded as a "divine" fruit—the 'real ambrosia.' Few in Ceylon will be inclinded to agree with the *Saturday Review* in its opinion as to the three best fruits of the east.

Dr. Bonavia, in his work on the oranges and lemons of India and Ceylon, recognises two distinct types of "Sweet-oranges":—The Malta or Portugal orange which is close-skinned, and the Suntara orange of India, a loose-skinned fruit. Both these he thinks came into India originally from China or Cochin China. The Seville orange which was the first to reach Europe is found wild in Cochin China, and, in only one place, in India; but Dr. Bonavia does not believe it could have been the progenitor of the other two. The pummelo, which De Candolle ranked as a distinct species, is considered by the author to be a giant variety, developed under tropical and subtropical conditions of luxuriance from the Portugal orange, and to have acquired its modern characters in the Malayan Archipelago. The original wild pummelo has never been discovered. The Keoula orange is placed in a distinct group, in which Dr. Bonavia includes the mandarin. This latter says the *Indian Agriculturist* is grown with some difficulty in India. It is mentioned as growing well in the Peradeniya Gardens in Ceylon. Besides the above varieties there is the "Khatta" or "Karya" orange, the pulp of which is very sour though free from bitterness. Of this it is said that it is very distinct from the others, and that it is not certain whether it should be classed as an orange or a lemon. "I am informed," says Dr. Bonavia, "that this Khatta orange makes a good sweet jelly, and also a good marmalade. I know the decoction of its fruit is a good febrifuge, and also a good splenifuge."

Dr. Wagner is reported to have said in a lecture recently delivered at Darmstadt, that "our experiments show clearly that green manure enables us to make cheap atmosphere nitrogen accessible even to those plants which are not capable of taking it up directly. The only condition is that we employ as green manure plants which are really "nitrogen increasers," viz. lupins, peas, clovers, horsebeans, serradella, vetches &c. Dr. Wagner is evidently an upholder of Hellriegell's theory, regarding the source of nitrogen in leguminous plants, which, however, English experiments have negatived. That the leguminosc have peculiar facilities for collecting nitrogen is admitted on all hands, but that they do so from a source other than the soil still remains to be proved. The results of foreign and British experiments have differed before now. In the early days of agricultural chemstry. French experiments tended to prove that plants absorbed free nitrogen from the air through their leaves, but this idea is now quite exploded.

THE CULTIVATION OF MANIOC.

(Concluded.)

II. *(Jatropha Utilisima)*

BY W. A. DE SILVA.

The use of the Manioc yam as food is restricted to certain districts of the Island especially the Western and the North-Western In other provinces the cultivation is only sparsedly carried on, probably as the demand is so small, as well as because people are naturally afraid of being poisoned by eating the yam. Cases of poisoning by manioc are very rare and they very seldom occur in the districts where it is largely consumed. One possible reason of this is, that by repeated cultivation the manioc in these districts may have lost to some degree its poisonous properties, for by cultivation plants are improved to a great extent. Even in places where the yam is largely grown it sometimes proves to be poisonous and occasionally causes death. The disastrous results often occur by using the yam without proper preparation, either by means of drying or boiling.

The poisonous principle in the manioc is believed to be hydrocyanic acid, a nitro-carbon compound, and in proof of the presence of this acid it may be mentioned that the leaves and yams

give out the characteristic smell of cyanogen and the cyanides. The process of drying or boiling always removes the traces of this acid and with it the poisonous properties. There is a popular belief among the villagers that this poisonous property is contained in the rind and core of the yams. With this idea many take the precaution of remove the core before preparing the yam for food. There is, however, no reason to believe that the poisonous property is contained in this particular portion of the yam only. There is another popular idea, that the cases which prove fatal by the use of this root are due to eating such yams as have been bitten by poisonous serpents. Any danger from manioc-poison is easily averted by taking some simple remedy, such as salt and water.

The bitterest and the most piosonous varieties of manioc, the like of which we do not find in this Island, are largely consumed by the West Indians without the least danger. Waterton in his "Wanderings in South America" says. This most useful plant is to the Guiana natives what corn is to us. It is a tall unbranched plant growing irregularly and knotted at intervals, and having leaves with a purple gloss. The root is the portion that is eaten and it is scraped down on a board stuck full of sharp flint or other stones and called by the name of Tumarrie. In order to extract the poisonous juice, the scraped cassava is forced into a long narrow basket called a Matappi, made exactly on the principle of the "Siamese links.' When the matappi is full it is scarcely half its length when empty, but is more than double its thickness; it is then tied to a branch of a tree' or to a beam of a house, and an earthen pot is placed under it and a heavy weight is tied to the lower end. The weight of the stone causes the matappi to increase in length but to diminish in thickness, thus exerting a powerful pressure on the cassava, and squeezing out the juice, which runs through the interstices and so down the matappi into the pot. The dry cassava is then removed, rubbed through a basket work sieve, formed into flat circular cakes about two feet in diameter and a quarter of an inch in thickness, and baked upon a flat heated stone or plate of iron. Meanwhile the poisonous juice has been kept out of reach of children, poultry &c., and on being boiled and flavoured with red-pepper or Cassiana, becomes the well known cassereep or pepper pot of the West Indies. When the cassava bread is eaten it is generally dipped in the cassareep."

The prepared manioc is known in commerce as manioc arrowroot or cassava flour and in another form as tapioca. The manioc arrowroot is prepared much in the same way as the real arrowroot. Ther oot is well rinsed in water, and the outer bark having been first removed, the inner white mass is scraped into water, well squeezed, washed several times and the particles taken out and carefully dried. The other form of cassava is largely consumed and is prepared as follows. After the cleaned roots have been well smashed the starch which is obtained is placed on heated iron plates when it forms into granular masses. Thus prepared and packed the substance keeps well for a long time and forms a desirable article of food. Both these prepared varieties of manioc when manufactured on a large scale are made in factories where the different processes are carried on with the aid of various appliances.

The extension of the cultivation of this product in Ceylon is very desirable as it is found to grow well in most parts of the Island. It yields a large quantity of food materials which could be advantageously used locally for both man and beast, and a large and profitable trade could be opened with great advantage, if the product is cultivated to any extent. Sir Samuel Baker in his work on Ceylon mentions, that this plant was at one time grown in Colombo at Mr. Thurstan's Industrial School and that the flour was prepared and sold largely.

A REPORT ON COTTON.

The Agricultural Department of Madras has issued a bulletin, consisting of a report on the results of an inquiry as to the growth of cotton in Tinnevelly by Mr. S. T. Iyer one of its Agricultural Inspectors. The enquiry was mainly directed to the method of cultivating, and the yield of, Tinnevelly cotton, with the object of enabling the Department to devise such experiments as might best improve the staple and increase the out-turn. In the inquiries into the subject of weather and seasons, it was found that dews and sea-breeze were beneficial to cotton, but fogs, especially after rainfall, proved highly injurious by withering up the fine bolls and flowers, while the strong N. E. wind dissipated moisture from the soil and plants, causing the leaves of the latter to wither and droop. Observations tended to prove that cotton requires somewhat dry weather for its growth, and that heavy rainfall is disadvantageous.

As a rule cotton is cultivated on various sorts of black soil in Tinnevelly, and rarely on red soils. The various kinds of black soils are distinguished by particular native names, and they are generally divided into (1) superior friable black soil, (2) inferior ditto, (3) stiff black soil, and (4) saltish black soil. The first, which is considered to be by far the best, has a substratum of limestone, and the second a substratum of gneiss: both soils being mixed with particles of the underlying rocks. The red soils are divided into red loam and red sand; the grey sandy loams and gravelly soils are very rarely used for cotton cultivation.

The different kinds of manures applied to cotton soils are (1) cattle manure by itself or mixed with earthy matter, (2) some form of earthy, matter, (3) sheep manure, and (4) green leaves and twigs. The earthy matter referred to is generally silt taken from the beds of tanks, pools, and from the sides and beds of streams. It appears to be the practice to fold together all the flocks of sheep of one or more villages in each man's field successively, though each man tends his own flock. The manure is not generally applied to the cotton crop itself, (1) because it is found that in the year of application the crop has unequal growth, while in the second year the crop is more uniform, and (2) because the ryots find by experience that crops to which manure is applied suffer more than unmanured crops from protracted drought.

On the different kinds of black soil cotton is raised generally once in two years, and ryots generally arrange to cultivate some one particular crop, cotton or another, extensively in the village

Though co-operation is seen among the Goiyas of Ceylon in paddy cultivation—so far as labour of men and animals is considered—still it is a system which might be more extensively adopted. The plan of manuring the land by folding all the animals of a village for a time on each man's land is well worthy of imitation, but the Ceylon Goiya has first to learn the value of cattle manure as well as the advisability of keeping his cattle together instead of allowing them to stray about. Again the system of a number of village cultivators who individually own but a few acres combining for the cultivation of a particular crop—and especially cotton—is greatly to be commended.

For thoroughly clean land, there ploughings are ordinarily sufficient for cotton; but if it is very foul it is ploughed as many times as possible. The soil is ploughed in a dry condition, and to more than the ordinary depth, so that it may be thoroughly cleaned, as cotton particularly needs a clean soil. Under ordinary circumstances the cotton plants are cleared in August-September, about 10 months after sowing. If rainy weather prevails, picking is carried over a longer period. In 1888-9 cotton picking was continued in some cases on to the middle of November. In fact cotton is picked till the yield becomes too poor to necessitate further delay in cleaning the land. The plants are generally fed off by sheep before they are cleared. They are pulled up after rain, tied into bundles and stacked, to be carted off later. The stalks are generally used for fuel, and when thin, are also used for thatching: but when the stalks are long and branchless they are used for weaving into tats or manure baskets or large baskets for preserving grain. In Ceylon there would be further use for cotton stalks in the manufacture of tea baskets. It is recommended that cotton should be sown in lines (as is done in some parts of India), so that the land would admit of being ploughed while still under crop, when the first rains in May occur. Cotton is sometimes sown in lines with Horse gram or other kinds of gram, or sown mixed with coriander, Hibiscus Cannabinus &c. Two varieties of cotton (G. Herbaceum) are grown: the one variety has white coloured and round seeds, easily removeable white lint, a woody stem spherical bolls and white stamens; the other has dark coloured elongated seeds, less white lint removable with difficulty, a fibrous stem, conical bolls, and red stamens. The former is generally preferred for the better classes of lands. Cotton is said to grow better when a rotation (ordinarily two-course) is adoqted—the other crop of the rotation being generally Varagu (Sin: Amu) and Cumbu; both of which are cultivated in Ceylon to some extent. Good cotton seed for sowing, which the ryot generally purchases from dealers who clean cotton, sells at R5 to 5½ per 240lb. It is stated that the second picking appears to furnish seed of the best quality. The quality of cotton-seed is roughly tested by a small quantity being chewed. If the mass of chewed seed is yellowish, the seed is considered good; otherwise it is rejected. The seed is ginned a very short time before it is required for sowing, lest the seed should damp and spoil. Before sowing, the seed is freed of all adhering lint, formed into a heap over which a thick solution of buffalo dung in water is poured, and rubbed on the ground to fully coat the seed with dung; then it is spread to dry. Six standard measures of seed, weighing about 10lb. 5 oz., are sown per acre. The usual time of sowing is October but sometimes it is delayed, owing to want of rain, till the middle of November.

Cotton is scarcely ever irrigated in Tinnevelly, though it is stated that irrigation stimulates it to better growth and production. The Hon. Mr. Mitchell was very sanguine of cotton being cultivated witb success under irrigation in Ceylon, and was exceedingly anxious that the experiment should be tried. A passed student of the School of Agriculture might be told off to lay a few acres under cotton and cultivate the crop with the aid of irrigation. Further particulars are given with regard to the cotton plant as grown in Tinnevelly as follows:—

The first bloom appears about the 8 or 9 weeks after sowing; the first bolls begin to open about 90 days after sowing; the first picking commences about 105 days after sowing.

The cost of raising cotton is given R9¼ per acre: the value of outturn at R34½; the profits at R25¼ per acre. It is admitted however, that the price of cotton at the time this estimate was made, was rather higher than usual. In fertile soils and under good treatment. 1,000lb. of seed-cotton per acre is no unusual out-turn; an ordinary good yield may be taken to vary from 750 to 900lb. of seed-cotton; while 500lb. may be taken as a fair averages. It is assumed by dealers that 6 pods (of about 328lb. each) of seed-cotton are required to produce 500lb. of lint, and therefore the average out-turn of an acre is 125lb. lint. Not only has the area under cotton is Tinnevelly extended of late, but the out-turn has also been increased, owing to the stimulus given by the rise in price, which, at one time as low as R7 a podi, has risen to 3 and 4 times that value. The following pests, to which cotton plants are subject are mentioned:—beetle, grasshopper, borers, bollworms, cotton worms, plantlice, rot of boll, mildew, and rust; but no remedies are suggested.

An appended statement shows that ⅔ of a ryot's holding is on the average allotted to cotton. About ¾ of the cultivated area of dry land in the district is ordinarily bought under cotton, and the author of the report gives it as his opinion that there is hardly any scope for extension of cultivation though there is some prospect of increasing the production by better cultivation, for which suggestion are thrown out, such as more careful selection of seed, improvement of mechanical and chemical condition of soil, sowing in lines, alteration of time of sowing &c. It would appear that no fair trial has been given to foreign varieties of seed, and but for a few stray Bourbon bushes, there is no evidence of new varieties of seed being used or tried by the ryots.

Altogether the report under review (forming Bulletin No. 19 of the Agricultural Department of Madras) is a most exhaustive one, and reflects the greatest credit on its author. It is in reports such as this that one sees the good results to be expected from the establishment of Agricultural Departmets, and how very necessoary it is that Agricultural Inspectors or Itinerary agricultural officers should be appointed in connection with any body that is concerned with the improvement of agriculture, so that useful and valuable reports on

matters into which enquiry is called for, may be drawn up. But it is still more necessary that these reports should be entrusted to competent hands. It is an anomaly to depend for agricultural reports on those who have little knowledge of the subject and less judgement to exercise in agricultural affairs; and that these reports should be submitted to men who have made no study of the science and practice of agriculture, who have no sympathy with any movement for the improvement of agriculture, and whose opinions and recommendation are therefore of no value. So far as Ceylon is concerned the sooner a competent board of agriculture is appointed, the better for all concerned in the improvement of native agriculture. It has already been stated through the press that the establishment of a veterinary department is in prospect, surely on agricultural department should have precedence. In fact, veterinary work might with advantage be made a branch of the agricultural department, and double duty be done by the officers of the department, who will be both agricultural and veterinary inspectors in the rural districts. There is of course no radical reform to be brought about in native agriculture, but yet there are scores of ways in which an organized body of qualified and experienced men can encourage and help native agriculturists, and further their interests. The material is available, but it is for the Government to bring about the organization and to stamp it with its imprimatur.

SILICIOUS SOILS.

The reply which the enquiry of a correspondent to the *Ceylon Observer* anent the silica question has elicited from Professor Geikie—we suppose Professor James Geikie—has naturally caused a good deal of consternation to some of our tropical agriculturists. It is to be noted however that Professor Geikie who has no pretension to be an agriculturist, does not give his own opinion as to the value of silica in plant economy, but that of Professor Johnstone. Now as there is more than one professor of this latter name, we are naturally anxious to know who and what Professor Johnstone is; while we do not hesitate to say that the statement attributed to him is a very misleading one. The import of Professor Johnstone's opinion is evidently intended to be that silica is "injurious" to the generality of plants inasmuch as the fertility of land (as generally reckoned) is in the inverse ratio to the amount of silica in the soil; but as it is expressed, the statement would naturally convey a wider and less correct meaning to the ordinary reader. There is no doubt, as Professor Wallace remarks in his work on India, that plants draw a much larger supply of their nitrogenous food from the atmosphere, in the tropics, than they do in temperate regions, owing to the fact that there is so much electricity in the atmosphere of the tropics. Electricity is admitted to be the only original source of combined nitrogen, producing by its action nitrous acid which is oxidized into nitric acid by ozone or proxide of hydrogen. Thus it is that the almost pure silicious soils of the tropics are not barren wastes, and are enabled to support their own peculiar natural growth of vegetation, which cultivation has in particular cases raised to economic importance. Nitrogen is the only incumbustible (or organic, as it is sometimes less satisfactorily named) element of plant food which there is difficulty to account for a sufficient supply of. Silicious soils generally contain fragments of more complex minerals than quartz which slowly increase the ash or mineral constituents available for the plant. It is also very probable that from the more general, more complete, and more rapid rate of decomposition in tropical climes, the proportion of ammonia (very variable in quantity) in the atmosphere is much higher than that in temperate regions. If however a sandy soil is composed of pure silica it cannot supply any plant food: and though the difficulty as to the supply of the chief incumbustible elements of plant food may be got over, the lack of the essential mineral ingredients will render such soils sterile whether in temperate or tropical regions.

THE GRAPE VINE.

(Vitis Vinifera.)

6. *Preparation of the land.*—The land selected for a vineyard should be dry and sufficiently elevated to prevent any water stagnating on it during heavy rains. If it slightly slopes so much the better. Open drains should be cut in order to prevent 'wash'; and under drains must be constructed if the subsoil is not sufficiently porous to drain away all superfluous water. Stones broken to the size of the "metal" generally used for roads, or a little bigger, may be used for the subsoil drains.

It is very important that the tillage of the land should be thorough and efficient. In Jaffna Batticaloa and other parts of Ceylon where grapes are grown, we seldom find more than a couple of vines growing in a garden. No proper system of tillage has therefore been practised as yet in viticulture here. It is customary to dig a hole, say, about 4 feet square and 3 feet deep and to fill it up with half-rotten cowdung and soil, and then to plant the vine in the centre of the hole. So long as it is young the plant thus treated seems to thrive as well as can be expected, but as it grows older it will be seen that there is a two-fold disadvantage by this pit-method of planting: viz,—(1) The roots of the vine instead of freely spreading out laterally will be confined to the pit, crowding and coiling up in the loose rich soil in it as they would do in a flower pot.

(2). The lower roots are encouraged to go too deep regardless of the nature of the soil below,—whether it be sweet or sour, cold or warm &c.

To give some idea of the tillage adopted on the famous and extensive vineyards of Australia, I shall quote a few lines from the annual report for 1889 of the Agricultural Department of Queensland, as reprinted in the *Tropical Agriculturist* of February 1890. In the course of some remarks about Mr. Searle's vineyard, the report says:—"Although as Mr. Searle admits, he is but an amateur viticulturist, he appears to be possessed of a good deal of common-sense, and is quite aware that it is not sufficient for the growth of vines to dig a hole and stick a vine into it, or to

plough the land shallow and then lay out the vineyard and plant the cuttings. All the ground in this vineyard is trenched to a full depth of two feet, the soil well turned up to the weather, and by these means a good crop of fruit has been secured even in dry weather." It is such thorough tillage that we ought to adopt here in Ceylon in the culture of grapes as well as that of many other crops.

Haputale, E. T. HOOLE.

22nd May 1891.

(To be continued.)

GENERAL ITEMS.

Mr. J. P. Manchanayake writes from Kuala Lumpur, Strait Settlement:—The climate here is rather warmer than that of Ceylon, and the rainfall excessive—June and July being the wettest months. The frequent showers mitigate the heat to a great extent, and the place is rendered of a fairly healthy nature. Kuala Lumpur which is the seat of Government of Selangor, is situated in a valley about 22 miles away from Klang where the steamers touch at, and which is connected by a railway with the Capital. Wild animals are numerous in these parts, and are a cause of much danger in clearing forest lands. Tin is mined to a considerable extent, and gold is also found in some parts. There are splendid timber-trees to be found here, and most of them straight-grown and rising to a great height. The Chinese section of the inhabitants go in for cultivation on a large scale, and work with great skill. I have seen no plough used here, work being done by the mammoty which is handed more dexterously than I have seen it done in Ceylon. The cultivators besides using cattle and pig manure, also use human excreta very largely. especially for vegetable cultivation. Paddy is not grown to any great extent, and rice is imported from Siam and other parts. Coconuts grow well, but are not cultivated on a very large scale—such plantations as I have seen being small in extent, though the trees in them are fine specimens. Coffee and tea are also cultivated, and the former is doing well.

The *North British Agriculturist* has a long and interesting article on agricultural education, the great importance of it, and the best means of imparting it. Among other considerations it notices the importance of specimens and drawings as a means of instruction. It is with this idea that the school of agriculture museum was stated, which, while it is illustrative of agriculture in so far as it contains a fair number of specimens of agricultural products or models of them, also represents the allied sciences of Botany, Geology and Chemistry and Zoology to some degree. The museum is yet in its infancy and is growing very slowly, inasmuch as it depends almost altogether for supplies on what the students of the school could find in their foraging expedition during the holidays.

The oldest cotton mill in India, says the *Indian Textile Journal*, is the Savana Spinning and Weaving Mills in Pondicherry; this concern was established in the year 1830. In Bombay the first cotton mill was established in 1851. In Calcutta the oldest mill dates from 1864. At Madras the first mill dates from 1874.

To this we may modestly add that the first (and only) mill in Colombo (and in Ceylon) was established in 1889.

The Half-yearly examinations at the School of Agriculture commenced on the Monday, the 25th of May, and continued throughout the week. The School will remain closed during the whole of June for the Summer vacation.

Received for the School Museum, some samples of paddy and two coconuts of abnormal size from the Secretary Grama Rakshaka Samagama, and a mass of fossil resin, dug out of a marsh in the Narampitiya fields, from Dr. Drieberg.

The Australian Irrigation Colonies, which were commenced three years ago on the river Murray, in Victoria and South Australia, by the wellknown firm of Chaffey Bros, Limited, continue to make remarkably rapid progress, the number of settlers from Great Britain already amounting to several thousands, a large proportion of whom belong to the weal their classes. From the last report of the Directors of the Company engaged in the construction of the gigantic irrigation works, it appears that the steady influx of population previously reported has been fully maintained. The sale of land for the past six months has been substantially in advance of any previous like period. The area disposed of now exceeds 11,000 acres, and is for the most part being rapidly brought into a state of productiveness. Heavy crops of grapes have been gathered from vines planted but two seasons. The currants and raisins have been declared superior to those imported, and the apricots have been pronounced equal to the finest French. As anticipated a great advance in the value of land has followed these demonstrations of the productiveness of the soil, offers of £75 and £100 per acre having been refused for lots planted but twelve months ago.

The life of the agricultural labourer in Italy does not appear to be a happy one. He can rarely earn more than 6 to 7 pence a day, which often has to support also a wife and family. The consequence is that many labourers can only afford to have one meal of polenta (Indian corn) a day, and this has to be eaten without a sufficient allowance of salt owing to the costlines of that commodity which is a government monopoly. As a result thousands are suffering from a disease known as pellagra, produced by bad food and want of salt. The poor Goiyas of Kolonne Korle, Walpane and other unfortunate districts in Ceylon have thus their co-sufferers in the more enlightened West.

John Bechmann in his "History of Inventions, Discoveries and Origins," says that the real Tourmaline was first brought from Ceylon, and made known by the Dutch, about the end of the 17th or beginning of the 18th century. Dr.

Dunmuis averred that in 1703 the Dutch first brought from Ceylon "a precious stone named Tourmaline, Turmale or Trip. " In the catalogue of the collection of Natural Curiosities belonging to Paul Hermann who was in Ceylon from 1670 to 1677, sold at Leyden in 1711 was a stone named *Chrysolethus Turmale, Zeylon.* This was evidently meant to be Tourmaline, and the circumstance is considered to prove that both the stone and name had their origin in Ceylon. In 1719 the Academy of Sciences at Paris announced in their Memoirs for 1717, that in the latter year Mr. Lemery had laid before them a stone found in a river in Ceylon, nswering to the description of Tourmaline. In the Dictionary of Natural History, which is often printed with Hübner's preface, under the article *Trip* the following passage occurs:—" This stone was brought to Holland by some persons who had travelled in India, from the Island of Ceylon, where it is found pretty frequently among the fine sand near Colombo, and sold to the German Jews. These caused it to be cut thinner, and the price of it soon rose to 8 and 10 Dutch florins. It has been since much dearer; but at present it is cheaper." The first person who thought of explaining the property of the Tourmaline by electricity was Linneus, who in his preface to his Flora Zeylanica, calls it the electric stone.

ROYAL BOTANIC GARDENS.

EXTRACTS FROM THE REPORT OF THE DIRECTOR FOR 1889.

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1.—*Pérádeniya Gardens.*

THE cumulative work of the past ten years has at length resulted in the whole extent of these grounds being in fairly satisfactory order and well in hand, all that is now necessary being to keep them up at the improved standard they have reached. For this purpose our labour force is sufficient, and the increase made during the past year to the vote for Garden requisites has raised that also to an amount more adequate to meet the various demands of a large botanical establishment.

Lawns.—The fine stretches of turf have had much attention devoted to them during the year, and are very greatly improved. A large staff of boys has been constantly at work digging out the *Elephantopus* and other disfiguring weeds, levelling, removing anthills, stones, &c., working the meadow-mower and smaller machine, and sweeping up leaves. The large meadow-mower was thoroughly repaired in the early part of the year. The extraordinary rains of April brought on the annual attack of beetle-grubs earlier than usual, and by June the lawns were almost bare, but as usual they quickly recovered themselves.

Though not connected with the Botanic Gardens, this seems also the right place to put on record the successful establishment at Colombo of the great Brazilian water-lily, *Victoria regia.* Two plants of this, from the Agri-Horticultural Society's Garden at Madras, were brought by the Honorary Secretary, Mr. Thurston, to Colombo in October, and having been planted in a new tank in the Fort Public Gardens produced flowers in January, 1890.

Labelling.—The majority of the trees and shrubs of interest are now provided with clear and conspicuous labels, this work having been vigorously carried on during the year, two or three men being kept constantly employed. The interest and usefulness of the Garden to visitors have been very greatly increased by the information thus given. The labels now used are made of brick, and are beyond the attacks of white ants, and very permanent. This is the cheapest material that can be obtained, and the only defect is a liability to break across near the ground, owing to imperfect baking. The lettering is in white paint on a black ground, and this is the principal cost. I am also experimenting with another label, in which printed tickets can be employed (thus much reducing cost); these are made of cement, in which a piece of glass is inserted over the name, and if these are found to be watertight they will probably be the best and cheapest form.

Large labels bearing the names of the Natural Families have been set up in their respective places in the Herbaceous Ground.

Visitors.—No less than 1,534 persons (not resident in Ceylon) signed their names in the visitors' book, a considerable increase over last year. The opening of the new station at Pérádeniya, which took place on December 1, has rendered it easy to visit the Gardens by train, the station being no more than about a quarter of a mile away.

Weather.—Though the rainfall for 1889 was about the average in quantity, its distribution was very unusual. As a rule, our two wettest months are October and June, but their places were

occupied in the past year by April and July, months with usually but a moderate fall. The rains of the north-east monsoon, in the three last months of the year, were also remarkably slight in amount, only 18·42 in., against an average of 31·10 in. for the previous six years, and the deficiency here was made up (so far as the whole yearly amount is concerned) by the extraordinary fall in April—nearly double its average for the previous five years—and in July. The unusual distribution has considerably affected the averages of past years.

This comparative failure of the north-east monsoon has not injuriously affected the vegetation of the Gardens in any way, but the premature and excessive fall in April stimulated the giant bamboos to send up their culms a month or more before the usual time; they grew, too, with great rapidity—one which Mr. Clark measured lengthening at the rate of 13½ in. in twenty-four hours. The fine mass of this species, which I mentioned in my last report as having suffered from the flood of 1888, appears to be still further weakened by this excessive growth, and one side of it has died. The whole clump will have to be removed.

2.—*Hakgala Garden.*

Many improvements have been carried out here during the year, details of which are given in the Superintendent's report printed below. The most important are the continuation of the retaining wall along the high road, the remaking and metalling of the old carriage drive, the repairs to the Conservatory, and the clearing and transformation of an abandoned tea and coffee plot below the nurseries. So many new roads and paths and other alterations have been made in the Gardens during the last eight years, that it is now very desirable that they should be re-surveyed, and an accurate plan made.

I again wish to urge the necessity of an examination and report by an expert on the best mode and probable cost of a constant supply of water to the Garden. Its want was not experienced to any serious extent during the past year owing to the even distribution of the rainfall, but severe droughts may at any time occur again.

The number of species in cultivation in this Garden is now over 2,500, and is constantly increasing; it is in contemplation shortly to affix labels to the more interesting and attractive plants.

During my absence in Europe on leave Mr. Nock acted as Director of my Department, and carried out his duties in a very satisfactory manner.

Hares and Porcupines.—These animals have been very troublesome during the year. The former do great damage to the Herbaceous Garden and Nursery, as well as in the little experimental plots of grass. The porcupines destroy such plants as iris, lilies, cannas, dahlias, and others with roots of a bulbous or succulent nature. We have tried to catch them with snares and traps, but have, as yet, failed.

Visitors.—The number of visitors during the year was 1,185, being an increase of 69 over that of last year. The largest number in any month was 194, in January, and the smallest 31, in June.

Weather.—The weather was remarkable for an excessive rainfall during the first nine months of the year, for the late and very light north-east monsoon, and for the strength and continuance of the wind of the south-west monsoon till quite late in the year. It did not really settle down and come steady from the north-east quarter till the end of November. During the south-west monsoon the wind continued at a higher rate of speed for a much longer period than has yet been recorded from this station, and in consequence much more damage was done to the trees and plants than usual. I may state that the anemometer shows the true direction of the wind that passes over this Garden during the south-west monsoon to be N.N.W., and that during the north-east monsoon is E.S.E.

The total rainfall for the year was 88·34 inches, which fell on one hundred and eighty days. This is a little less than last year, but still about 1 inch higher than the average for the previous five years, which was 87·36 inches.

The average mean temperature of the air for the last six years is 63·1.

The highest temperature in the sun's rays during the year was 154 on March 10, and the lowest on grass was 37 on December 31.

The mean amount of cloud for the year was 6·8, the cloudiest month being November, with a mean of 8·2, and the brightest month was, again, February, with a mean of 3·9.

3.—*Henaratgoda Garden.*

The Muhandiram in charge reports that the very wet season from April to September caused much wash and necessitated a good deal of work in renewing the paths. No record of rainfall is kept here except of the days on which it falls, which were 163 in the past year.

The Garden is in excellent order, and its contents generally in a flourishing state. A few improvements have been made during the year. New gates have been put up at the entrance, the plant house has been improved by the erection of brick stages and a roof of coir matting, and the Conductor's house painted and his office enlarged; this building requires tiling. About half an acre of the remaining jungle has been cleared and a plantation of black pepper, grown on *Erythrina* sticks, formed. Two hundred brick labels from Péradeniya have been painted with the names of some of the most interesting trees and set up in their places.

Very few persons now visit this charming little tropical Garden; there were but twenty-nine in the course of the year. As I have remarked before, this is due to the fact that the quick trains

no longer stop at Henaratgoda station, and that the nearest resthouse is at Mirisweti, three miles from the Garden. By leaving Colombo, however, by the slow train at 6 A.M., it is possible to spend some three hours at the Garden and get back to Colombo before midday.

4.—*Anurádhapura Garden.*

We have had much difficulty this year in obtaining water for the Garden, the supply from Tissa tank being only occasionally available for us. Moreover, the small pond in the Garden is so nearly on a level with the point in the ẹla from which our open channel is supplied, that, even when allowed to enter, water will scarcely flow. After consultation with the Public Works Officer, it has now been decided to deepen the pond, and to supply it from a point in the ẹla much closer to it, by a short sluice through the bank. It is hoped that this alteration—the cost of which can be met from the small Provincial vote annually placed at my disposal—will be effected early in the year, and that thus, being able to fill the pond periodically, we shall be able to tide over times of scarcity. The rainfall for 1889, however, 49·76 in., though rather below the average, was fairly well distributed, falling on no less than eighty-eight days. As elsewhere in the Island, April was an extraordinarily wet month, 10·73 in., falling on fifteen days, being registered.

A portion of the Garden which was very rough has been levelled, the Arachchi's bungalow thatched and repaired, and cooly lines partly built. No prison labour has been available for work in the Garden during the year, owing to all being engaged on the clearing and excavation of the ruins. I was able to purchase 200 loads of manure for the Garden this year, which was much needed.

5.—*Badulla Garden.*

Progress here is but slow ; want of labour, a very irregular supply of water, and the trespass of cattle are some of our principal hindrances. With regard to the first, it has been a subject of some surprise and disappointment to me that my frequent requests for the use of some of the large number of prisoners employed on public works in Badulla have been met to the extent of only ten men for five days during the whole of the past year. I hope, however, that now certain large improvements in the town have been completed, more assistance in this way will be provided for the Garden. The conductor would be enabled to make considerably more progress if a small number of prisoners were regularly told off for work here, and the practice steadily continued for some time.

As regards the water supply, it is expected that this will be provided for by means of a channel which is to be carried across the Garden for the supply of an artificial lake in the centre of the adjoining racecourse. In connection with this channel, it is intended to make a tank in the Garden, and I have the assurance that for this work prisoners will be allowed.

A fairly good supply of manure is regularly received from the town. By its use many of the trees and shrubs are making good growth and beginning to give some shade to this very exposed piece of land.

8.—*Notes on Economic Plants and Products.*

Tea.—It has been my custom in these annual reports to place on record the exports of the leading plantation products of the Colony, and make some comment upon them. The story, however, from year to year is now of much the same character, the tea enterprise having so greatly overshadowed all others and engrossed so much attention, that there is less and less to report on other products.

The export for the commercial year ending September, 1889, reached over 32½ million pounds (32,516,682 lb.), nearly 12 million lb. more than in the previous twelve months. For the calendar year 1889 it amounted to 33,383,035 lb. The Australian Colonies took of this somewhat over 1¼ million pound (1,134,156 lb.), a considerable increase over the year before, but still a very small proportion of the 24 million pounds annually consumed in those Colonies.

The price of our tea in the London market has been subject to remarkable fluctuations during the year, being very low in the middle, but more than recovering towards the end ; and the average for the whole year may be put at somewhat over 11*d.* per lb., which is very little less than that of the year before. Bearing in mind the greatly increased quantity, this must be considered a decidedly satisfactory position.

Encouraging, too, is the general absence at present of any serious drawbacks to cultivation in the way of insect or fungus enemies. Green bug is troublesome in a few places, and at least one attack of *Helopeltis* ("Mosquito Blight") has been recorded, but these are of little account. It is, however, most earnestly to be hoped that this present general immunity from any serious pests will not blind planters to the necessity of providing against future possibilities by paying attention to other cultivations.

Cinchona.—The export for Ceylon for the commercial year has been 10,498,487 lb., a further fall of over a million pounds in the gradual lessening which has been going on since 1886. The

diminution is further exhibited if we take the figures for the calendar year 1889, which are only 9,179,280 lb., and the process must now continue at a rapidly increasing progression. As a consequence, the price of bark may be confidently expected to rise, though it must be remembered that our place as dominating the market is being taken by Java. The question, however, arises whether a revival of cultivation here should be recommended, and it is well worthy of consideration. Speaking generally, I consider it has been sufficiently proved by experience that neither the soil nor the climate of Ceylon are well suited for cinchona trees, which have shown themselves here to be, as a rule, short-lived and unhealthy. I refer especially to the wet and windy localities so frequent in the planting districts; the mortality here is indeed so great among young trees as to render it almost impossible to cultivate cinchona with success. But in the drier districts the case is different, and in places where *C. officinalis* and *C. robusta* hybrid do well the cultivation is likely to again prove very profitable. But with the large consignments of bark of high quality from Java to compete with, it will be more than ever useless to grow inferior varieties.

Coffee.—An export of 86,440 cwt. for the commercial year—84,749 for the year 1889, a decrease of over 50,000 cwt.—shows coffee to have at length come down to the position of a quite secondary product. Nor—in spite of the encouragement of high prices—are there any signs of a general attempt at a revival of this cultivation. Reports, however, of the great improvement of coffee under shade in Coorg and Mysore have led to the planting up of some estates with trees, especially with the native *Ficus glomerata*, which is considered in India to be peculiarly suitable. The effects of shade on the appearance of coffee are undoubtedly striking, and in very dry climates (as the districts of India mentioned) particularly so; diseased and exhausted bushes are doubtless kept living and retain their leaves longer when shaded, but the quantity of blossom and crop is, I should suppose, not likely to be increased. Moreover, it should be remembered that the shade-trees themselves are an additional burden on the land (an important matter on a poor soil). On the other hand, they undoubtedly afford some protection against continual and excessive infections by the spores of *Hemileia*; and their general absence in Ceylon in the past doubtless helped on the very rapid spread of leaf-disease through the Island.

Cacao.—There has been a considerable increase in the export of this for the commercial year 1888–89, 14,461 cwt.; and that for the year 1889, 17,164 cwt., is the largest yet recorded. It is much to be regretted that so small an area of the country appears suited to this cultivation. Even in suitable localities cacao still suffers somewhat from the attacks of *Helopeltis*; and larger enemies that have to be kept down are squirrels and wild cats.

Caoutchouc Trees.—With reference to the remarks I offered in my last report as to the great desirability of Government taking up the cultivation of *Hevea* (Para rubber) on a large scale, I have now the satisfaction of being able to record that the Forest Department has made a commencement by the selection of land near Námbápana, in Sabaragamuwa, a portion of which is to be cleared and planted during the ensuing season. This decision was not come to till too late in the year to enable the seed of 1889 to be used for the purpose. We had a large crop at Henaratgoda, and a smaller one at Péradeniya. As I have often had occasion to point out, these seeds quickly lose their vitality and have to be sown immediately. About 8,000 were sold, a considerable number sent properly packed to Queensland, and the remainder sown at Henaratgoda, where there are now several thousand seedlings, which, when "stumped," can be rendered available for planting out.

I have supplied the Forest Department with such information as our experience of this tree at Henaratgoda has afforded us. It may be useful, as showing the rate of growth, to bring together the records taken at the end of each year of one tree at Henaratgoda for the past ten years. The tree was four years old in 1880; the circumference is taken at 3 ft. from the ground.

	ft.	in.		ft.	in.
1880	1	4	1885	3	7
1881	1	9	1886	4	1
1882	2	1½	1887	4	5½
1883	2	6	1888	5	0
1884	3	0	1889	5	5

The Panama rubber trees (*Castilloa*) do not now grow rapidly; the best tree at Henaratgoda has increased during the year half an inch only, being now 3 ft. 5 in. in circumference. At Péradeniya the trees of this species are not looking healthy or thriving well.

In March last the conductor at Henaratgoda experimented on the rapidity of the flow of rubber from a Para, a Castilloa, and a Ceara tree respectively, and reports that to obtain 4 oz. rubber it took, from a Para tree 3½ hours, from a Castilloa 2 hours, and from a Ceara 5 hours.

To illustrate the importance of the caoutchouc trade, I may quote some figures of the imports from Brazil into the United Kingdom. In 1887 no less than 113,955 cwt. were imported, valued at £1,605,115, or about £14 per cwt.; the greater part of this was Para rubber, the price of which during the past three years has varied between 2*s.* and 3*s.* 6*d.* per lb. This enormous quantity is wholly

obtained from wild trees, and additions to the sources of supply are urgently needed ; indeed, there is every probability that in the long run, as with cinchona so with caoutchouc, it is upon systematic plantations in the Old World that we shall have to depend for our supply.*

Guttapercha.—The increase in these slow-growing trees is but slight. *Payena Leerii* is 23 ft. high and 10 in. in circumference, and *Dichopsis pustulata* 14 ft. 9 in. high, with a circumference of stem of 9 in.

Cotton.—The mills of the Ceylon Spinning and Weaving Company at Colombo being now in working order, the company is prepared to purchase at certain rates any quantity of Ceylon-grown cotton ; and a considerable quantity of the Tinnevelly sort and smaller quantities of Egyptian and New Orleans has come in from the Jaffna, Batticaloa, and Anurádhapura districts.

In continuation of previous consignments (see my last report), Mr. Mitchell sent, in January, seed of the Bourbon variety. This was tried at Henaratgoda, Badulla, and Anurádhapura, and in the latter Garden afforded a small but fairly good crop of pods. At Badulla it suffered much from red bugs, and at Henaratgoda it failed completely.

A very successful experiment with Sea Island cotton on an estate in the Dumbara district requires some notice, as showing what may be done by careful cultivation in a favourable season. A very fine crop is now (February, 1890) being harvested off 90 acres sown at the end of August in good soil, after experiencing an eminently favourable north-east monsoon.

By the kindness of the proprietors I have been provided with the record of rainfall for the last three months of the past year, the critical time when the pods were ripening, and of the two previous years ; and as the result so strongly confirms the remarks made in my last report as to influence of dry weather on this cultivation, the record is here given:—

	1887.	1888.	1889.
	Inches.	Inches.	Inches.
October	8·82	10·55	7·47
November	11·51	6·31	4·68
December	17·21	9·64	3·03
Total ...	37·54	26·50	15·18

The contrast of the past season, as compared with 1887 and 1888, is very marked, especially in December, and the failure of the rains of the north-east monsoon, however injurious to some cultivation, proved most beneficial to the cotton crop. The only insect enemy which proved serious in this locality was *Helopeltis*, which almost destroyed a patch of a few acres ; but its ravages were stopped completely by a systematic catching by hand.

Tobacco.—A large quantity of tobacco, chiefly of the Sumatra sort, has been grown and cured in the Mátalé and Dumbara districts, and at the present time (February, 1890) as much as 62 tons of cured leaf is being sorted and stacked on one estate in the latter district, where most of the curing is carried on. It remains to be seen how Ceylon high-class tobacco will fare in the home market.

Cubebs.—My efforts to obtain this plant for the Gardens have been continued. On June 5, we received from our correspondent at Soerabaya, Java, a Wardian case containing twelve plants and six cuttings, with the assurance that the greatest care had been taken to insure the acquisition of the right plant. The cuttings were dead, but nine of the plants were in good order, and these were at once planted out, and are doing well both at Péradeniya and Henaratgoda. None have yet flowered, but from the foliage alone I fear that again we have failed to obtain the true *P. Cubeba.* I still, however, hope to get from Java ripe seed (as to which there could scarcely be any doubt) sown in a Wardian case and allowed to germinate before leaving.

Gambier.—This product has been suggested as a desirable cultivation for the natives in the wet districts of the south of Ceylon, and an application from the Government Agent of Ratnapura for a large supply of seed has been forwarded to the Singapore Government. I made a few remarks on the plant affording this substance in my Report for 1887 (p. 14), and on the difficulty I had found in getting either plants or seeds here alive. In August last we again received a small supply of

* The only plantation of *Hevea* in the East at present is that under the Indian Forest Department at Mergui. Lower Burma. According to the last Report (1888–89) there are here 49 large trees—probably the survivors of the 500 sent from Ceylon in 1878—6,358 put out in 1887 and 1888, and 15,607 in nurseries.

seed, but none germinated, and in November two plants arrived in a Wardian case, but soon died. I am now informed by Mr. Ridley, Superintendent of the Singapore Botanic Gardens, that these seeds do not retain their vitality after gathering for more than twenty-four hours. But the plant grows like a weed at Singapore, and if once successfully introduced here would probably flourish equally well.

Sarsaparilla.—The "Jamaica Sarsaparilla" of commerce is the produce of *Smilax officinalis*, and comes chiefly from the Cordillera of Chiriqui in the Isthmus of Panama. It derived its name "Jamaica" from being formerly brought from Central America to that island, whence it was exported to Europe. Of this plant next to nothing is known, but a *Smilax* has been cultivated in Jamaica itself for many years, and affords a sarsaparilla which is exported to a small extent. A local nurseryman having recently forwarded a sample grown in Ceylon from plants of this kind imported from Jamaica, attention has been again called to the plant, of which several specimens from Kew are in cultivation at Péradeniya. I gave a woodcut illustration of the base of the stem and roots of this *Smilax* in "Medicinal Plants" (sub t. 289), in an account of *S. officinalis*, to which species the late D. Hanbury considered it to belong: but as I there pointed out, the specimens do not well agree with De Candolle's description of the type-specimens of that species. Quite recently also Sir J. Hooker has expressed his opinion (Bot. Mag., sub t. 7054) that the cultivated Jamaica sarsaparilla and *S. officinalis* will prove, when their flowers are known, to be different species.

Disease in Cocoanut Leaves.—Some alarm was caused in the early part of the year on a cocoanut estate at Véyangoda by an affection of the leaves of this palm. The disease was seen to commence as small yellow roundish spots, which gradually die in the centre, and by spreading and coalescing finally result in the death of considerable portions of the leaf. A parasitic fungus at once suggested itself as the cause, but a careful microscopical examination has not revealed to me the presence of any species likely to cause the damage. Mr. M. C. Potter, of Cambridge, however, who investigated some material which he took home with him from Ceylon, informs me that he finds a fungus in the patches allied to *Helminthosporium*, which he thinks may do some damage. This I did not detect in the specimens examined by me, and I have arrived at the conclusion, from an inspection of the trees and from the history and local character of the affection, that the malady is due to some cause affecting the general nutrition of the trees attacked. The disease does not show any decided tendency to spread even in the neighbourhood of the worst cases.

Oranges from Queensland.—The loss of a consignment of grafted oranges from the Queensland Acclimatization Society in 1886 was recorded in my report for that year (p. 10); and I am now glad to report the arrival of a second assortment in September in excellent order, from the same source. There are twenty-four selected named varieties, and a plantation has been formed at Péradeniya, where they are doing well.

Kei Apple (*Aberia caffra*).—Bushes of this at Hakgala of some age, but of the origin of which we have no record, fruited during the year. This large spiny shrub is a native of Natal and Kaffraria, and grows well in South Europe and other warm temperate regions; in Natal it is much used for fences. The fruit has a very agreeable acid flavour, and is well adapted for preserves. The plant is a near ally of our native "Kétembilla" (*Aberia Gardneri*), the smaller fruit of which is also edible.

Fruit Garden at Hakgala.—Mr. Nock reports :—

> The beds for the fruit trees were completed in January, and the plants set out 6 ft. apart. They commenced to grow at once, and the cherries and raspberries bore a good many fruit. The apples, pears, plums, cherries, and peaches made very fair growth, and the wood ripened well. They began to rest in June. The strong winds at this time blew off nearly all the leaves, and they had a very rough time of it. Early in November all were pruned that required it, and it was hoped that they would then start into active growth, and to induce them to do so they were lightly syringed night and morning. Nearly all the apples and a few of the pears and plums started into growth in December, but I regret to have to report that none of them look really healthy, and I am afraid that very few are likely to do much good.

Trial of Potatoes at Hakgala.—Mr. Nock, having received from England tubers of twenty varieties of potatoes, has been able to make a trial of them, and gives the results as follows :—

> They were planted, in good soil, on February 6 in a plot of ground facing the east. They began to show on the 15th; by the 20th were all above ground, and by the end of the month most of them were earthed up.
>
> During the first three or four weeks they suffered a good bit from grub, especially Nos. 2, 8, 10, 15, 18, and 19. They grew very fast, and looked remarkably well till the heavy rains at the end of March, and immediately after the rains some of them began to show signs of disease in the tops, the worst being the Kidney varieties, Nos. 5, 9, 13, 15, and 19.
>
> The weather continuing wet they were all lifted on April 22, having been in the ground only seventy-five days. If the weather had been fine they would have been allowed to stay in the ground a fortnight or three weeks

longer. The sets were all carefully counted and weighed before they were planted, and the tubers produced were counted and weighed as they were lifted. The following table will show the result :—

No.	Names.	Number of Sets.	Weight in Ounces.	Number bitten off by Grubs.	Number of Tubers produced.	Weight in Ounces.	Remarks.
1	Magnum Bonum ...	15	28	1	250	336	Stood the rains well
2	Vicar of Laleham ...	16	28	6	36	146	Do. and tubers all large
3	White Roses ...	15	22	1	170	336	Do. and tops not much diseased
4	White Elephant ...	15	28	1	86	216	Do. do.
5	Ashleaf ...	8	7	2	30	11	Very badly diseased, and very small
6	Adirondack ...	13	29	—	140	336	In every way satisfactory
7	Weber's Early White Beauty	17	21	1	130	352	Do.
8	Mona's Pride ...	8	8	6	36	32	Suffered from grub, otherwise good
9	Racehorse ...	4	3	—	22	15	Badly diseased
10	Tom Price's Black Prince	9	9	6	24	16	A capital potato, no disease, but badly cut off by grub
11	Reece's Kidney ...	4	4	3	4	1	Suffered from grub
12	Chiswick Favourite.	4	7	—	32	64	Stood the rain the best, and in every way satisfactory
13	Bowyer's Kidney ...	5	6	3	16	16	Badly diseased
14	Imperator ...	10	18	3	80	208	Stood the rains well, a capital potato
15	Premier ...	6	7	6	—	—	Came up weakly, and all were taken by grub
16	Beauty of Hebron...	4	5	—	21	64	Suffered badly in the tops, but a fine potato and of large size
17	Cosmopolitan ...	6	9	2	26	48	Suffered badly in the tops, but fairly good crop
18	Yorkshire Hero ...	5	6	5	6	3	Did no good
19	Myatt's Prolific Ash-leaf	14	21	10	36	24	Suffered most from grub, and produce very small
20	Sutton's Seedling ...	19	25	3	145	240	Suffered badly in the tops, but gave a good round crop

It will be seen from the above that ten or twelve sorts gave capital returns, Weber's Early White Beauty being the best,—producing 22 lb. from 22 oz. There is no doubt that potatoes can be grown very profitably at elevations from 4,000 to 5,500 ft. if they are planted in the dry months, but a week's heavy rain, or even a soaking of 2 or 3 in. of rain, generally brings on disease and puts an end to their growth, and when this occurs the sooner they are lifted the better.

Shantung Cabbage.—Seeds of this Chinese vegetable, the "Pé-tsai," were received from Kew early in the year. A good account of this cabbage will be found in the Kew Bulletin for May, 1888 (p. 137). It is the *Brassica chinensis*, L., and is considerably different in appearance from the ordinary varieties of cabbage. The seeds were sent to Hakgala, and the following report is now forwarded by Mr. Nock :—

It grows, I find, remarkably well here. In appearance and habit of growth it is like a gigantic Cos lettuce, bright pea green in colour, and when cooked possesses a very agreeable and delicate cabbage flavour. It also has the great advantage of standing the rains well, and growing quickly to a size ready for use. The stalks of the leaves being thick and succulent, can be dressed and eaten like seakale, and taken altogether it may be considered a valuable addition to the kitchen garden.

In China it is also eaten uncooked as a salad, and said to have a very delicate flavour.

Stachys tuberifera, Naud. (*Stachys affinis*, Bunge).—In continuation of last year's report Mr. Nock writes :—

The crop of this vegetable was taken up in September, and weighed 20 lb. This was the produce of a small patch of land 9 ft. long by 4 ft. broad. The soil was literally full of the small edible roots. They are, however, I fear, too small and insipid to meet with much favour among Europeans. The roots were stored in dry sand, but they did not keep well, and a good many very soon decayed. All the sound roots were again planted in December, and commenced to grow at once. We have now a good stock of plants, and can supply any one who wishes to try them.

This vegetable seems to be very popular in France, and at Amiens a preserve is made from it. The English name for it in some catalogues is "Vegetable Whitebait."

Ullucus tuberosus.—The following further information on this vegetable is sent by Mr. Nock :—

The crop of these tubers was lifted early in the year, and the produce from 30 square feet was 15 pounds, and from another little patch was gathered 9 lb. Reckoning 15 lb. from 30 square feet. they cropped at the rate of 9 tons to the acre. But the whole crop of 24 lb. was taken from a space of 100 square feet, which gave a yield of, say, 5 tons to the acre. This shows a variation, of, say, 4½ tons an acre for a bad crop up to 9 tons for a good crop. Fifty of the largest tubers weighed exactly 20 oz. The 12 largest weighed 6 oz., and the largest single tuber exactly ¾ of an oz.

They have very much improved in strength of growth and size of tuber since last year, and I think by selection and careful cultivation there is no reason why they should be produced in a few years as large as ordinary potatoes. And if the flavour can only be improved in a corresponding degree, it would become a valuable vegetable, as it grows well, and so far has not been subject to any disease.

The above anticipations of Mr. Nock have been since confirmed by the results of lifting, on February 26, the crop yielded by 50 selected tubers planted on June 10, and weighing only 17 oz. He writes :—

I found the yield to be 52 lb., and the largest tuber was a little over 2 oz. One root gave 636 tubers, weighing 6 lb.. These were grown in a bed only 32 ft. long by 3 ft. wide ; the yield per acre would be enormous.

Mr. Nock sent me twelve of the best tubers for trial as a vegetable, and boiled in well salted water until quite tender, and served with white sauce, they are excellent. They are a little " waxy," but I think that in this tuber, if we have not exactly a substitute for the potato, we have a very good addition to our vegetables.

Conifers at Hakgala.—The yield of timber of two trees at Hakgala cut down this year is worth nothing—one, *Cryptomeria japonica*, about sixteen years old, produced 90 ft. of 1-in. boards, measuring in width 16 in. at bottom to 6 in. at top. The other, *Cupressus torulosa*, about twenty years old, gave 176 ft. of 1-in. boards, much like white pine in appearance, and easy to work.

Library.—The MS. catalogue of the contents of the Library, which I prepared several years ago, and have since kept up, has now been printed, forming a little pamphlet of 28 pages, which was issued in February. The titles are systematically arranged under thirteen classes of subjects.

The Library contains a good working collection of Botanical books, but their careful collation showed that a good many were imperfect. The most serious gaps were in that most necessary constituent of a Botanic Garden library, the " Botanical Magazine," and these, I am glad to say, we have been able almost to fill up by means of a special vote. This was sufficient to purchase the whole of the first series (53 volumes), and seven volumes of the third series, leaving only eight volumes needed to complete this valuable work, which has now reached its 116th annual volume.

Museum.—During the coming year I hope to make a good commencement with a Museum of Economic Botany at Péradeniya, a small vote for the purpose, long promised, having at length been granted. This will all be expended on glass-fronted cases and glass-stoppered jars, experience having shown that all dried vegetable specimens must be protected from the air. Four rooms of the house formerly occupied by the Director are available for the Museum, of which two are now occupied by timbers, and I purpose, at all events for the present, to restrict the collection to the wild and cultivated productions of Ceylon only. And I may take this opportunity of appealing to all who have the means of obtaining specimens and samples suitable for exhibition to assist me in making an adequate display of raw and manufactured vegetable products of all kinds, and from all parts of the Island, by forwarding such to Péradeniya.

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COLOMBO SALES OF TEA.

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 28th May, the undermentioned lots of Tea (8,891 lb.), which sold as under:—

Lot No.	Mark.	Box No.	Pkgs.	Description.	Weight lb.	c.
1	N G	1	4 hf-ch	bro peo	200	37
2	O K O	2	2 do	dust	170	24
3	Esperanza	3	5 do	bro or pek	280	58 bid
4	Do	4	15 do	or pek	690	72
5	Do	6	54 do	pekoe	2268	46
6	Do	8	1 do	dust	80	22
7	Handro-kande	9	3 do	bro pek	165	
8	Do	10	15 do	pekoe	750	47
9	Do	12	1 do	congou	43	36 bid
10	Do	13	1 do	bor pek dust	44	34
11	F	22	21 do	bro mix	1680	34

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 28th May, the undermentioned lots of Tea (80,284 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Duckwari	492	3 hf-ch	congou	150	29
2	Do	494	5 do	red leaf	275	25
3	Halpautenne	496	5 ch	bro pek	520	46
4	Do	498	5 do	pekoe	510	37
5	Do	500	5 do	pek sou	500	33
6	Do	502	5 do	sou	500	30
7	Do	504	2 do	unassorted	180	31
8	Do	506	1 do	dust	150	18
9	Do	508	1 do	congou	90	27
10	Citrus	510	6 hf-ch	bro pek	360 }	57
11	Do	512	1 do	do	26 }	
12	Do	514	9 do	pek sou	450	38
13	Do	516	1 do	do	48	38
14	Do	518	3 do	sou	150 }	
15	Do	520	1 do	sou	31 }	
16	Do	522	10 do	pekoe	550 }	41
17	Do	524	1 do	do	49 }	
18	Richlands	526	38 ch	bro pek	4332	51
19	Do	528	21 do	pek sou	2184	35
20	Columbia	530	23 hf-ch	bro pek	1150	71
21	Do	532	23 do	pekoe	1035	53
22	Do	534	3 do	pek sou	132	37
23	Do	536	1 do	dust	65	27
24	Court Lodge	538	52 do	bro pek	2600	73
25	Do	540	37 do	pekoe	1739	57
26	Do	542	60 do	pek sou	2400	50
27	Do	544	30 box	do	600	46
28	Do	546	5 hf-ch	sou	200	35
29	Do	548	3 ch	dust	432	26
30	D	550	6 do	bro pek	600	40
31	D	552	7 do	pekoe	630	54
32	D	554	5 do	pek sou	400	32
33	D	556	4 do	bro pek sou	320	38
34	L G E	558	5 hf-ch	or pek	300	42
35	Do	560	4 do	pekoe	220	32
36	Do	562	7 do	dust	630	23
37	H E P	564	10 hf-ch	bro pek	650	55
38	Do	566	11 do	pekoe	550	40
39	Do	568	15 do	pek sou	750	31
	(The Yatiyantote Tea Co., Limited.)					
40	Polataga-ma	570	33 hf-ch	bro pek	1650	62
41	Do	572	49 do	pekoe	2450	46
42	Do	574	68 do	pok sou	3740	40
43	Abamala	576	26 do	bro mix	1300	30
44	Do	578	5 do	dust	450	26
45	R	580	2 do	pek dust	124	32
46	R	582	1 do	bro tea	44	22
47	R	584	6 do	pek fans	346	34
48	R	586	3 do	congou	150	30
49	R	588	8 do	sou	320	33
50	R	590	2 do	pekoe	90	35
51	Midlothian	592	25 do	bro pek	1400	74
52	Do	594	13 ch	pekoe	1300	53
53	B & D	596	3 do	red leaf	300	18
54	Sutton	598	31 ch	bro pek	3410	60 bid
55	Do	600	19 do	pekoe	1900	42 bid
56	Craighead	2	30 hf-ch	bro or pek	1500	60
57	Do	4	20 ch	pekoe	1800	42
58	Do	6	18 do	pek sou	1530	34 bid
59	Do	8	6 do	sou	510	29
60	Bandarapolla	10	28 hf-ch	bro pek	1400	55
61	Do	12	27 do	pek sou	1215	36
62	Andangodde	14	15 ch	sou	1275	29
63	N P	16	14 do	red leaf	1120	27
64	M W	18	2 do	dust	260	25
65	Do	20	2 do	sou	165	29
66	Do	22	1 do	red leaf	80	21
67	L H	24	1 ch	sou	85	26
68	Do	26	1 do	red leaf	80	23
72	Kolooya	34	27 do	pekoe	1340	41
73	D	36	1 do	pekoe	50	33
74	D	38	1 ch	pek sou	60	27
75	D	40	1 do	dust	156	18
76	D	42	1 do	red leaf	75	12
77	Horagoda	44	23 hf-ch	bro pek	1150	57
78	Do	46	45 do	pekoe	2025	44
79	Do	48	26 do	pek sou	1170	41
80	Do	50	1 do	dust	85	26
81	Ancoombra	52	7 ch	bro pek	784	47
82	Do	54	6 do	pekoe	672	37
83	Do	56	7 do	pek sou	784	35
84	Do	58	1 do	sou	150	30
85	Yellan-gowry	60	41 ch	or pek	2255	53 bid
86	Do	62	18 do	pekoe	1530	39 bid
87	Do	64	24 do	pek sou	1920	39
88	Do	66	14 do	bro mix	1190	30 bid
89	Do	68	2 do	or dust	280	30
90	Y D	70	14 ch	fans	1400	26
91	Kirimettia L M	72	8 hf-ch	bro pek	400	52
92	Do	74	29 do	pekoe	1450	40
93	Do	76	15 do	pekoe S S	750	34
94	Do	78	4 do	dust	284	25
95	Peru	80	9 do	bro pek	450	65
96	Do	82	27 do	pekoe	1215	45
97	Do	84	2 do	sou	90	33
98	Mukeloya	86	5 do	bro pek	300	55
99	Do	88	6 do	pekoe	300	42
100	Do	90	8 do	peks sou	400	40
101	Do	92	1 do	bro mix	32	28
102	Do	94	2 do	dust	110	30

☞ "Not arrived" lots are omitted.

Messrs. E. BENHAM & Co. put up for sale at the Chamber of Commerce Sale-room today, 4th June, the undermentioned lots of Tea (6,756 lb.), wich sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	St. Leys	51	12 ch	pek sou	1200	38 bid
2	Do	52	2 do	bro mix	220	27
3	Do	53	2 do	pek dust	280	29
4	Kintyre	54	66 box	new season green tea glossy (uncolrd.) No. 1	660	81
5	Do	55	54 box	new season green tea (uncolrd.) No. 2	1080	68 bid
6	Do	56	14 hf-ch	new season green tea glossy (uncolrd. No. 3	784	59
7	Do	57	28 box	new season green tea fans No. 4	532	49

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 4th June, the undermentioned lots of Tea (12,982 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	A K A C	24	31 hf-ch	bro pek sou	1550	40
2	Do	26	3 do	congou	155	33
3	Do	27	2 do	fans	120	34
4	Do	28	1 do	dust	70	27
5	St. Cathe-rine	29	9 ch	bro pek	810	64
6	Do	31	9 do	pekoe	810	46
7	Do	33	7 do	pek sou	630	36
8	Do	35	1 do	pek fans	60	28

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
9	Handro-kande	36	3 hf-ch	bro pek	165	54
10	Do	37	15 do	pekoe	750	37
11	Do	39	1 do	congou	43	29
12	Do	40	1 do	bro pek dust	44	26
13	Yahalakelle	41	8 do	or pek	400	52
14	Do	43	14 do	pekoe	672	38
15	Do	45	9 do	pek sou	432	34
16	Do	47	16 do	unassorted	800	31 bid
17	Do	49	2 do	red leaf	160	23
18	Do	50	1 do	dust	75	25
19	Agraoya	51	8 ch 7 hf-ch	bro pek	1150	57
20	Do	53	20 ch	pekoe	2000	39
21	Do	55	1 hf-ch	dust	70	25
22	O H N	56	5 do	dust	375	24 bid
23	L H	57	2 ch	pek fans	225	20
24	Do	58	1 do 1 hf-ch	dust	221	20
23	Kotte	62	20 do	pekoe	900	45

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 4th June, the undermentioned lots of Tea (19,958 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	P	78	2 hf-ch	bro pek	124	79
2	P	79	3 do	pekoe	182	48
3	P	80	15 do	pek sou	855	40
4	P	81	1 do	congou	55	30
5	P	82	1 do	red leaf	27	32
6	P	83	2 do	dust	153	29
7	Roseneath	84	18 do	pekoe	990	47
8	Do	85	19 do	peks sou	1102	39
9	Yarrow	86	49 do	pek sou	2450	40
10	Talpe	89	25 do	pekoe	1125	46
16	Lyndhurst	92	15 do	bro pek	1350	57
17	Do	93	25 do	pekoe	2250	41
18	Do	94	27 do	pek sou	2430	38
19	T	95	1 do	bro pek	100	54
20	T	96	3 do	pekoe	300	38
21	W	97	3 hf-ch	pek sou	120	33
22	C W	98	3 do	bro mix	150	31
23	S S	100	2 ch	pekoe	200	35
24	T. Galla	1	50 hf-ch	or pek	2700	48 bid

Mr. E. John put up for Sale at the Chamber of Commerce Sale-room today, 4th June, the undermentioned lots of Tea (63,757 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	N	278	3 ch	bro mix	240	19
2	Haugran	279	7 do	dust	1050	27
3	Do	280	5 do	congou	450	33
4	B T	281	9 do	pek sou	630	45
5	Do	283	23 do	unassorted	1725	35
6	Do	285	1 do	dust	75	28
7	Brownlow	286	14 do	bro pek	1400	70
8	Do	288	19 do	pekoe	1710	53
9	Mahanilu	290	60 hf-ch	or pek	3600	73
10	Do	11	54 ch	pekoe	4860	53
11	Do	13	17 do	pek sou	1615	42
12	Do	15	2 do	dust	160	28
13	Do	16	1 do	bro mix	70	29
14	Great Val-ley	17	51 hf-ch	bro pek	2550	62
15	Do	19	31 ch	pekoe	2945	47
16	Do	21	18 do	pek sou	1620	40
17	E W	23	6 hf-ch	congou	300	32
18	Do	24	3 do	fans	165	43
19	Do	25	9 do	dust	630	27
20	Mocha	26	59 do	bro pek	2950	71
21	Do	28	14 do	bro pek	770	55
22	Do	30	44 ch	pekoe	4180	51
23	Do	32	30 do	pek sou	2700	43
27	S G	40	13 do	pek sou	1274	37
28	K T	42	8 ch	unassorted containing 800-1 lb. lead packets	800	30 bid
29	Do	42	8 ch	unassorted containing 1,568-½ lb. lead packets	784	} out
30	Do	42	53 ch	unassorted containing 19,200-¼ lb. lead packets	4800	} out
31	Killaloo	44	28 ch	unassorted	2240	19
32	P G K	46	6 do	sou	378	31
33	Do	47	2 do	dust	282	26
34	Ayr	48	14 hf-ch	bro pek	700	67
35	Do	50	18 do	pekoe	792	46
36	Do	52	19 do	pek sou	798	39

Lot No.	Mark	Box No	Packages	Description	Weight per lb	c.
37	Do	54	3 do	congou	129	34
38	Do	55	2 do	fans	100	33
39	Do	56	1 do	pk dust	70	26
48	W	69	5 do	sou	250	34
49	W	70	8 do	bro mix	400	29
50	W	71	3 do	unassorted	150	33

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 4th June, the undermentioned lots of Tea (66,620 lb.), which sold as under:—

Lot No.	Mark.	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Bogahagoda-watte	93	2 hf-ch	bro pek	87	43
2	Do	98	2 do	pekoe	78	33
3	Do	100	7 do	bro mix	298	30
4	E G	102	1 ch	red leaf	110	22
5	F M	104	2 hf-ch	bro mix	130	22
6	F D	106	4 do	dust	290	27
7	Lethenty	108	4 ch	sou	400	34
8	Do	110	3 do	dust	435	28
9	B T N	112	1 do	sou	62	31
10	Do	114	1 do	dust	112	26
11	Kosgaha-hena	116	4 hf-ch	bro pek	200	38
12	Do	118	4 do	pekoe	200	30
13	Do	120	10 do	pek sou	500	26
14	Do	122	6 do	sou	300	26
15	Do	124	1 do	congou	45	20
16	C	126	5 do	dust	375	27
17	C	128	6 do	red leaf	300	20
18	C	130	7 do	congou	350	29
19	Clunes	132	22 do	bro pek	1100	60
20	Do	134	41 do	pekoe	1845	45
21	Do	136	18 do	pek sou	900	37
22	N E	138	14 do	congou	700	30
23	Do	140	9 do	bro mix	459	25
24	H	142	34 do	bro pek	2210	67
25	H	144	37 do	pekoe	2035	51
26	H	146	67 do	pek sou	3350	42
27	H	148	3 do	dust	160	30
28	Meddetenne	150	6 do	bro pek	330	57
29	Do	152	4 ch	pekoe	380	41
30	Do	154	4 do	pek sou	350	33
31	Do	156	1 hf-ch	dust	80	29
32	Dunlow	158	12 ch	bro pek	1260	71
33	Do	160	2 do	pekoe	180 }	49
34	Do	162	1 hf-ch	do	55 }	
35	Do	164	5 ch	pek sou	475	41
36	Do	166	5 do	bro pk sou	450 }	38
37	Do	168	1 hf-ch	do do	50 }	
38	Radella	170	26 ch	bro pek	2600	67
93	Do	172	24 do	pekoe	1920	51
40	Do	174	29 do	pek sou	2320	43
41	Mousakelle	176	31 hf-ch	bro pek	1860	66
42	Do	178	24 do	pekoe	1200	52
43	Do	180	16 ch	do	1600	49
44	Do	182	1 do	congou	100	45
45	Do	184	1 hf-ch	dust	90	22
46	Bowlaua	186	10 do	bro pek	1000	64
47	Do	188	12 ch	pekoe	1145	47
48	Do	190	15 do	pek sou	1350	41
49	Monaco	192	2 do	dust	340	26
50	I G	194	7 do	bro tea	630	36
51	Kirimettia	196	1 ch	bro tea	103	withd'n.
52	Do	198	1 do	red leaf	75	25
53	Do	200	1 do	dust	143	27
54	S S S	202	1 do	dust	112	23
55	Doonevale	204	3 hf-ch	bro or pek	150	53
56	Do	206	4 ch	pek sou	360	36
57	Do	208	7 do	bro mix	700	34
58	Do	210	1 do	congou	100	30
59	Do	212	1 hf-ch	dust	78	25
60	N	214	9 ch	fans	1350	32
61	Bandara-polla	216	32 hf-ch	pekoe	1600	43
62	Do	218	34 do	pek sou	1530	38
63	Do	220	2 do	dust	130	30
64	A D	222	11 do	bro pek	550	26
65	Do	224	2 do	pekoe	104	35
66	Do	226	5 do	bro mix	250	22
67	Thornfield	228	36 do	bro pek	2160	70
68	Do	230	45 ch	pekoe	4500	50
69	Do	232	4 hf-ch	pk dust	320	30
70	Horana	234	4 do	bro pek	164	39
71	Do	236	5 do	pekoe	203	50
72	Do	238	7 do	bro tea	280	39
73	A	240	1 do	pekoe No. 1	48	39
74	A	242	2 do	do „ 2	100	37
75	A	244	1 do 1 box	pek sou	58	27

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
76	A	246	1 hf-ch	pek fans	54	52
77	A	248	1 box	fans	12	30
78	A	250	2 ch 1 hf-ch	red leaf	222	22
79	A	252	2 ch 1 hf-ch	dust	369	25
80	Becherton	254	12 ch	bro pek	1200	62
81	Do	256	24 do	pekoe	2280	40
82	Atherfield	258	2 hf-ch	dust	160	29
83	Do	260	4 do	bro tea	200	32
84	Lyegrova	262	6 do	bro pek	300	46
85	Do	264	7 do	pekoe	350	38
86	Do	266	5 do	do No. 2	250	36
87	Rambodde	268	21 do	bro pek	1155	66
88	Do	270	23 do	pekoa	1150	50
89	Do	272	3 do	congou	150	38
90	Do	274	1 do	dust	68	28
91	C R D	276	2 do	fans	160	28
92	Do	278	2 do	red leaf	110	21
93	B	280	18 do	bro pek sou	920	38
95	Horagas-kelle	284	5 hf-ch	bro pek	250	54
96	Do	286	5 do	pekoe	217	39
97	Do	288	13 do	pek sou	622	34
98	Do	290	2 do	bro mix	112	25
99	V	292	10 do	pekoe	500	43
100	Angroo-wella	294	19 do	bro or pek	950	68
101	Do	296	36 do	pekoe	1800	51
102	Do	298	2 do	pek sou	100	38
103	Do	300	2 do	dust	164	31

☞ "Not arrived" parcels are omitted.

Messrs. A. H. THOMPSON & Co. up for sale at the Chamber of Commerce Sale-room, today, 11th June, the undermentioned lots of Tea (20,466 lb.), which sold at under:—

Lot No.	Mark	Box	Pkgs.	Description	Weight lb.	c.
1	A & F L	64	4 hf-ch	pekoe	220	38 bid
2	Do	65	1 do	sou	55	31
3	Do	66	1 do	pek fans	80	29
4	Harrow	67	9 do	bro pek	540	62
5	Do	69	18 do	pekoe	990	46
6	Do	71	2 do	pek sou	110	35
7	Do	72	1 do	bro pek sou	47	29
8	Do	73	2 do	bro tea	135	27
9	Ossington	74	7 do	bro pek	350	38
10	Do	76	11 do	pekoe	550	35
11	Do	78	8 do	pek sou	400	35
12	Do	80	7 do	red leaf	315	21
13	Keenagaha-ella	81	10 do	bro pek	654	59 bid
14	Do	83	9 do	or pek	540	54
15	Do	85	13 ch	pekoe	1300	45
16	Do	87	23 do	pek sou	2185	37
17	Do	89	1 hf-ch	sou	55	27
18	Do	90	1 do	fans	65	30
19	O K O	1	1 do	dust	80	27
23	Engura-kanda	98	18 hf-ch	bro pek	1188	66 bid
25	A G C	2	1 hf-ch	bro pek	56	30
26	Do	3	2 ch	congou	200	20
27	Do	4	1 hf-ch	fans	55	26
28	Do	5	15 do	dust	1050	28
29	Nahalma	7	25 do	bro or pek	1375	54
30	Do	9	22 ch	pekoe	2200	40 bid
31	Do	11	9 hf-ch	pek sou	495	35
32	Do	13	2 do	dust	150	27

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 11th June, the undermentioned lots of Tea (64,567 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb	c.
1	B	72	1 hf-ch	red leaf	50	27
2	B	73	2 ch	dust	160	27
3	B	74	3 hf-ch	congou	180	33
4	S	75	1 ch	congou	95	32
6	Bittacy	77	12 hf-ch	bro pek	720	68
7	Do	79	15 do	pekoe	900	49
8	B T	81	16 ch	unassorted	1200	34
9	Killaloo	83	80 ch	unassorted	6400	23
10	D E	85	27 hf-ch	unassorted	1350	51
11	Do	87	11 do	dust	693	53
12	Albion	88	23 ch	bro pek	2070	62
13	Do	90	19 do	pekoe	1520	47
14	Do	102	12 do	pek sou	960	37
15	Maria	104	14 do	bro pek	1540	61
16	Bollagalla	106	12 ch	bro pek	1200	61
17	Do	108	12 do	pekoa	1080	49
18	Do	110	24 do	pek sou	2160	40
19	Kanaugama	112	27 do	bro pek	2835	49
20	Do	114	16 do	pekoa	1600	38
21	Do	116	27 do	pek sou	2430	36
22	Gonavy	118	30 do	bro pk	3000	71
23	Do	120	7 do	pekoe	630	57
24	Do	122	8 do	pek sou	720	46
25	Do	124	1 do	dust	150	38
26	Comar	125	13 do	bro pek	1430	54
27	Do	127	19 do	pekoe	1900	40
28	Do	129	13 do	pek sou	1300	36
29	Do	131	4 do	bro mix	400	28
30	Do	132	5 do	dust	300	30
31	Great Valley	133	23 hf-ch	bro pek	1150	64 bid
32	Do	135	18 ch	pekoe	1710	47 bid
33	Do	137	03 do	pek sou	3870	42
34	Ancher (in estate mark)	139	15 do	bro pek	1725	60
35	Do	141	33 do	pekoo	3300	48 bid
36	Do	143	26 do	pek sou	2600	37 bid
37	P	145	4 ch	dust No. 2	665	28
38	Ceylon	146	24 hf-ch	bro pek	1200	45
39	B B	148	18 ch	bro pek	990	50
40	Do	150	15 do	pekoe Nos. 19-33	1350	37 bid
41	Do	152	13 do	pekoe Nos. 41-53	1170	36
42	Do	154	5 do	sou	500	31
43	Do	155	2 do	dust	280	27
44	Brownlow	156	13 ch	bro pek	1196	68
45	Do	158	21 hf-ch	pekoe	945	52
46	Do	160	17 do	pek sou	765	45
47	Do	162	1 do	sou	47	35
48	Do	163	1 ch	dust	107	28
49	W K	164	3 hf-ch	unassorted	156	31
50	Do	165	2 do	red leaf	85	21
51	N B	166	2 ch	bro mix	183	27
52	Do	167	1 do	or pek dust	120	41
53	A N	168	4 hf-ch	bro pek	160	61
54	Do	170	9 do	pekoe	360	47
55	Do	172	7 do	pek sou	280	40
56	Do	174	7 do	congou	280	34
57	Do	176	1 do	dust	50	34

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 11th June, the undermentioned lots of Tea (83,050 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	P M	2	1 ch	pekoe	75	32
2	Do	3	5 do	red leaf	503	20
3	Relugas	4	27 hf-ch	bro pek	1485	60
4	Do	5	14 ch	pekoe	1540	48
5	Do	6	17 do	pek sou	1700	41
6	Do	7	2 hf-ch	dust	163	21
7	St. Andrew's	8	21 do	or pek	1260	69
8	Do	9	24 do	bro pek	1344	50
9	Do	10	49 do	pekoe	2644	47
10	Wereagalla	11	13 ch	bro pek	1365	62
11	Do	12	5 box	bro pek	125	53
12	Do	13	18 ch	pekoe	1710	45
13	Do	14	16 do	pek sou	1440	40
14	Do	15	4 do	bro tea	440	36
15	Do	16	3 do	dust	450	30
16	Do	17	4 do	congou	340	34
17	Brae	18	12 ch	pekoe	1200	42
18	Do	19	20 hf-ch	pek sou	1100	41
19	Do	20	15 ch	do	1500	39
20	Do	21	8 do	sou	720	34
21	Do	22	3 do	dust	210	27
22	Do	23	1 do	red leaf	90	21
23	Malgolla	24	22 hf-ch	bro pek	1320	60
24	Do	25	26 do	pekoe	1430	47
25	Do	26	113 do	pek sou No. 1	5650	42
26	Do	27	9 do	pek sou No. 2	450	40
27	Do	28	14 do	bro tea	840	35
28	Do	29	3 do	sou	150	31
29	Do	30	3 do	dust	210	27
30	Ederapolla	31	21 do	bro pek	1155	55
31	Do	32	33 do	pekoe	1650	41
32	Do	33	16 do	pekoe No. 2	800	38
33	Do	34	8 do	pek sou	400	34
34	Do	35	3 do	bro mix	195	31

Lot No:	Mark	Box No.	Pkgs.	Description	Weight per lb.	c.
35	S	36	4 do	sou	200	34
36	S	37	1 do	dust	70	25
43	Dalguise	44	13 ch	or pek	1170	54
44	Do	45	26 do	pekoe	2080	41
45	Do	46	12 do	pek sou	1080	36 bid
46	Do	47	6 do	unassorted	540	25
47	Do	48	1 do	dust	140	28
48	C C	49	4 hf-ch	unassorted	160	27
49	P G	50	5 ch	pekoe	475	39 bid
50	Do	51	1 do	dust	160	26
51	Roseneath	52	18 hf-ch	bro pek	1080	53
52	Mausa	53	12 ch	bro pek	1320	56
53	Do	54	16 do	pekoe	1600	44
54	Kuruwitte	55	9 hf-ch	bro pek	450	72
55	Do	56	12 do	pekoe	600	46
56	Do	57	8 do	unassorted	400	36
57	Do	58	11 do	pek sou	550	37
58	Do	59	1 do	dust	77	28
59	Blairavon	60	21 ch	bro pek	2100	62
60	Do	61	23 do	pekoe	2070	46
61	Do	62	16 do	pek sou	1440	40
62	B F	63	2 do			
			1 hf-ch	pek fans	260	37
63	Do	64	1 ch			
			1 hf-ch	dust	200	29
64	C T M	65	11 ch	bro mix	990	28
65	Do	66	10 hf-ch	dust	700	28
66	Crurie	67	13 ch	bro pek	1300	65
67	Do	68	30 do	pekoe	2730	46
68	Do	69	14 do	pek sou	1274	39
69	E C	70	1 hf-ch	congou	52	29
70	Do	71	1 do	bro pek dust	80	30
71	Do	72	1 do	pek sou dust	76	27
72	R	73	1 ch	bro tea	120	38
73	R	74	1 do	bro mix	120	25
74	R	75	2 do	pek dust	280	29
75	R	76	1 do	dust	140	26
76	X	77	3 do	bro tea	360	27
77	X	78	1 do	dust	140	29
78	Salawe	79	3 hf-ch	bro pek	168	77
79	Do	80	4 do	pekoe	204	46
80	Do	81	10 do	pek sou	500	41
81	Do	82	1 do	dust	74	28
82	Do	83	7 do	unassorted	350	36
83	T	84	4 do	do	216	35
91	Heatherton	92	1 do	bro tea	45	28
92	Do	93	1 do	pek dust	80	31
93	S	94	4 do	bro tea	180	27
94	S	95	8 do	pek dust	640	32
95	Kitool Patna	96	6 ch	bro mix	600	28
96	Do	97	3 do	souchong	270	30
97	Do	98	1 do	congou	80	22
98	L D E	99	3 do	dust	360	25
99	Do	100	2 do	fannings	220	34
100	Paruscella	101	22 hf-ch	bro pek	1320	54 bid
101	Do	102	20 ch	pek sou	1700	36 bid
102	G E	103	5 do	unassorted	475	26
103	G E	104	2 hf-ch			
			1 box	bro tea	148	25
104	G E	105	2 ch	fannings	206	20
105	P E	106	1 do	pek sou	100	30
106	P E	107	1 do			
			1 hf-ch	souchong	150	26

☞ "Not arrived" parcels are omitted.

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 16th May:—

Ex "Liguria"—Powysland, 1t 101s; 1t 99s; 1b 104s; 1t 91s 6d.

Ex "Dacca"—Wannerajah, 5 bags 97s 6d; 2 bags 103s.

Ex "Glenlyon"—(BG)O, 1b 102s; 1t 100s. PB, 1b 110s.

CEYLON CINCHONA SALES IN LONDON.

(*From Wilson Smithett & Co.'s*)

Mincing Lane, May 23rd, 1890.

Succirubra.

Mark.	Natural Stem.	Renewed.	Root.
Stockholm	1¾d to 2d	—	—
Cranley	2½d	—	—
KTK	2½d	3½d to 4d	—
Ellagalla	3d	2½d to 4d	2½d
,, Hybrid	3½d	4½d	3d
Wiharagalla	2d to 2½d	—	—
Wariagalla	2d to 2½d	—	—
Mattakelle Hybrid	—	5d	4½d
Mahakanda	2¾d	4d	—
CHL, A in diamond	2d	3d to 3½d	—
BL, A ,,	2d to 3d	—	—
J, A ,,	3d	—	—
Angroowelle	2½d	3d	2½d to 3d
Meeriabedde	2½	3d	—
MCCCo. in diamond	2d	—	—
Keenagashena	2d to 2½d	—	—
Park BFF	2d	2¾d to 3d	—

Officinalis.

Mark	Natural Stem.	Renewed	Root.
Cranley	3d	4½d	5d
Lemagastenne, Ledger	8d to 8½d	—	—
Mattakelle ,,	3½d to 7d	5½d	—
Mahakanda	3½d	6d	—
CHL, A in diamond	3½d	—	—
Meeriabedde, Ledger	3d to 3½d	—	—
MCCCo. in diamond	—	7d to 7½d	—
ST & LC, B ,,	½d to 3½d	—	6d
St. Leonards	3d	—	—

CEYLON CACAO SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Mincing Lane, May 16th, 1890.

Ex "Glenlyon"—Dynevor, 13 bags 107s 6d; 1 bag 66s

Mincing Lane, May 23rd, 1890.

Ex "Parramatta"—Wiharagama, 2 bags 59s.

Ex "Legislator"—Delgolla, 22 bags 107s; 5 70s 6d.

Ex "Nepaul"—(F), 15 bags 115s 6d, 27 104s 6d 3 77s.

Ex "Capella"—Kondesalle (OBEC), 17 bags 103s; 9 104s; 5 46s.

Ex "Orion"—Mahaberia (OBEC), 29 bags 115s; 13 103s; 5 46s 6d. Kondesalle, 1 bag 46s.

CEYLON CARDAMOM SALES IN LONDON

(*From Our Commercial Correspondent.*)

Mincing Lane, May 16th, 1890.

Ex "Capella"—Gallantenne, 5 cases 3s 4d; 5 2s; 4 1s 6d. Lower Haloya AA, 1 case 1s 7d; 1 1s 4d; 1 1s 2d Old Madagama, 5 cases 1s 6d; 2 11d; 3 11d; 5 1s 5d; 1 1s 4d.

Ex "Legislator"—Kandanewera, 5 cases 1s 10d; 4 1s 11d; 8 1s 4d; 3 10d; 2 11d; 1 1s 6d.

Ex "Arabia"—Kobonilla, 2 cases 1s 9d.

Ex "Shanghai"—Havilland (OBEC), 7 cases 1s 7d; 6 1s 3d; 3 1s 1d; 5 1s 6d; 1 box 2d.

Ex "Cardiganshire"—AW(St.M)BS&Co., 14 cases 1s 10d; 6 1s 9d.

Ex "India"—Laxapanagalla, 1 case 1s 5d; 4 1s 4d; 1 10d; 1 1s 6d.

"CEYLON OBSERVER" PRESS, COLOMBO.

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COLOMBO SALES OF TEA.

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 11th June, the undermentioned lots of Tea (125,330 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	B	304	5 ch	pek sou	250	36
2	B	306	1 do	bro mix	50	28
3	B	308	1 do	congou	50	23
4	B	310	1 do	dust	50	21
5	Wallahan-duwa	312	7 bf-ch	bro pek	420	61
6	Do	314	13 do	pekoe	650	42
7	Do	316	7 do	pek sou	350	36
8	Do	318	3 do	sou	150	30
10	Do	322	1 do	bro tea	56	26
11	S P A	324	2 do	bro pek	140	39
16	Wevegoda	334	3 do	bro pek	180	58
17	Do	336	6 do	pekoe	330	41
18	Do	338	6 do	pek sou	330	34
19	Do	340	4 do	sou	200	31
22	Do	346	1 do	bro tea	40	26
23	K V	348	2 ch	congou	180	29
24	Nugagalla	350	24 hf-ch	bro pek	1200	72
25	Do	352	36 do	pekoe	1800	54
26	Do	354	2 do	pek sou	112	37
27	Do	356	6 do	dust	480	33
28	Inchstelly	358	7 do	bro pek	420	58
29	Do	360	8 do	pekoe	440	43
30	Do	362	16 do	pek sou	800	37
31	Do	364	2 do	sou	100	30
32	Do	366	1 do	bro pek dust	75	29
33	Hataie	368	37 ch	bro pek	4218	56 bid
34	Do	370	39 do	pekoe	3900	40 bid
35	Do	372	25 do	pek sou	2600	34 bid
36	Do	374	2 do	bro mix	192	25
40	T	382	7 ch	bro mix	770	32
41	T	384	4 do	pek fans	240	34
42	T	386	2 do	pek dust	180	29
43	T	388	1 do	dust	80	27
44	Bogahagoda-watte	390	4 do	bro pek	261	42
45	Do	392	2 do	pekoe	118	32
46	Do	394	5 do	bro mix	280	25
47	Do	396	1 do	dust	60	21
	(The Yatiyautota Tea Co., Limited.)					
48	Polatagama	398	30 hf-ch	bro pek	1500	67
49	Do	400	50 do	pekoe	2500	50
50	Do	402	60 do	pk sou	3300	41
51	Uvawatte	404	12 do	bro pek	480	45 bid
52	Do	406	20 do	pekoe	800	39 bid
53	Do	408	15 do	pek sou	600	36
54	Do	410	3 do	dust	195	28
55	Deyanella	412	12 ch	bro pek	1320	65
56	Do	414	19 do	pekoe	1900	50
57	Do	416	1 do	sou	96	36
58	N	418	9 hf-ch	sou	450	36
59	N	420	3 do	bro mix	135	29
60	N	422	6 do	dust	447	32
61	N	424	2 ch	dust	305	24
62	G	426	3 hf-ch	dust	240	32
63	G	428	1 ch	red leaf	100	33
64	G	430	2 hf-ch	bro pek	116	64
65	H	432	12 ch	sou	1020	32
66	Avisawella	434	4 do	unassorted	429	33
67	Do	436	1 do	dust	150	38
68	Do	438	3 do	sou	315	31
69	Ambla-kande	440	2 ch	bro tea	180	32
73	A & D T	448	8 hf-ch	bro pek	440	63
74	Do	450	14 do	pekoe	1400	50
75	Palmerston	452	9 hf-ch	bro pek	495	74
76	Do	454	12 ch	pekoe	1192	55
77	Do	456	6 do	pek sou	598	40
78	Theberton	458	56 hf-ch	bro pek	2800	57
79	Do	460	35 do	pekoe	1750	47
70	Do	462	4 ch	dust	200	27
81	Farnham	464	21 hf-ch	or pek	840	68
82	Do	466	42 do	pekoe	1890	49
83	Do	468	37 do	pek sou	1665	37
84	Do	470	4 do	fans	260	30
85	B & D	472	4 ch	dust	640	28
86	Gikiyana-kanda	474	7 ch	bro pek sou	770	33
87	Do	476	3 hf-ch	bro mix	150	27
88	Do	478	5 ch	dust	600	31
89	L	480	2 hf-ch	pekoe	68	39
90	L	482	2 do	pek sou	86	34
91	L	484	1 do	dust	33	30
92	Sutton	486	24 ch	bro pek	2640	65
93	Do	488	16 do	pekoe	1600	50
94	S	490	3 ch	fans	354	29
95	Bearwell	492	27 do	bro pek	2700	70
96	Do	494	34 do	pekoe No. 1	3060	52
97	Do	496	7 do	pek sou	630	42
98	Do	498	2 do	dust	305	27
99	Horagoda	500	14 hf-ch	bro pek	700	63
100	Do	502	11 do	pekoe	495	46
101	Do	504	10 do	pek sou	450	36
102	Do	506	2 do	congou	100	28
103	Do	508	1 do	dust	81	25
104	H	510	3 do	red leaf	174	24
	(Tolgaswela Tea Co., of Ceylon Limited.)					
105	Talgas-wela	512	2 ch	or pek	200	71
106	Do	514	9 do	pekoe No. 1	900	52
107	Do	516	1 do	bro pek ,, 2	100	52
108	Do	518	6 do	pekoe ,, 1	600 }	43
109	Do	520	1 do	do ,, 2	100 }	
110	Do	522	11 do	pek sou ,, 1	920 }	37
111	Do	524	1 do	do ,, 2	100 }	
112	Do	526	1 do	congou	80	33
113	Horana	528	1 hf-ch	bro pek	52	40
114	Do	530	1 ch	pek sou	92	31
115	Do	532	2 do	bro mix	180	23
116	Do	534	3 do	bro tea	270	26
117	Do	536	3 do	pek dust	225	22
118	Do	538	3 do	dust	388	22
119	Do	540	1 do	pek fan	60	22
120	Amblakande	542	19 do	or pek	1900	58
121	Do	544	31 do	pekoe	2480	43
122	P	546	1 hf-ch	pekoe	57	25
123	P	548	2 ch	congou	196	20
124	P	560	1 do	red leaf	91	17
125	P	552	1 do	red leaf	75	20
126	P	554	4 box	pekoe	20	25
129	Clarendon	560	27 hf-ch	bro pek	1485	75
130	Do	562	50 do	pekoe	2500	58
131	Glenorchy	564	34 do	bro pek	1870	71
132	Do	566	70 do	pekoe	3500	55
133	Court Lodge	568	15 do	bro pek No. 71-85	900	77
134	Do	570	19 do	pekoe No. 7-25	950	56
135	Do	572	26 do	pek sou No. 41-66	1170	46
136	Do	574	21 do	bro pek No. 86-106	1260	7 bid
137	Do	576	15 do	pekoe No. 26-40	750	54
138	Do	578	29 do	pek sou No. 67-95	1305	49
139	Do	580	2 ch	sou	180	41
140	Do	582	2 do	dust	300	25
141	Patiagama	584	13 ch	bro pek	1300	55
142	Do	586	71 do	pekoe	6745	42
143	Mukeloya	588	21 hf-ch	bro pek	1365	61
144	Do	590	14 do	pekoe No. 1	700	56
145	Do	592	11 do	do ,, 2	660	43
146	Do	594	27 do	pek sou	1620	40
147	Lyegrove	596	72 do	pekoe	3600	37
148	St. Helen	598	30 ch	bro pek	2700	59 bid
149	Do	600	26 do	pekoe	2340	45
150	Do	2	26 do	pek sou	2340	37
151	Do	4	2 do	pek fan	180	28
152			62 hf-ch	or pek	3410	58 bid
153			18 do	bro pek sou	920	26

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today 18th June, the undermentioned lots of Tea (24,496 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Glanrhos	14	10 hf-ch	bro pek	550	61
2	Do	16	20 do	pekoe	900	45
3	Do	18	18 ch	pek sou	1620	40

Lot No:	Mark	Box No.	Pkgs.		Description	Weight per lb.	c.
4	Torrington	20	59	do	bro pek	6490	59
5	Do	22	38	do	pekoe	3800	48
6	Do	24	54	do	pek sou	4860	40
7	Do	26	10	hf-ch	dust	800	29
8	St. Catherine	27	6	ch	bro pek	540	61
9	Do	29	4	do	pekoe	360	45
10	Do	30	3	do	pek sou	270	39
15	Hopton	38	1	do	dust	141	26
1	A & F L	39	1	hf-ch	bro pek	55	50
17	Do	40	1	do	pekoe	55	40
18	Do	41	1	do	pek fans	80	30
19	H W D	42	1	do	bro mix	45	31
20	Do	43	2	do	or pek dust	100	27
21	F	44	15	ch	pek sou	1200	38

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 18th June, the undermentioned lots of Tea (63,759 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Great Valley	177	1	ch	dust	145	28
2	Do	178	9	do	bro mix	855	31
3	Tellisagalla	179	11	do	bro pek	1100	48 bid
4	Do	181	8	do	pekoe	640	41 bid
5	Do	183	9	do	pek sou	765	37 bid
6	Do	185	1	do	dust	134	27
7	T T	186	7	do	pekoe	688	41
8	Do	188	2	do	flowery pek	200	54
9	Do	189	1	hf-ch	dust	65	27
10	Do	190	1	do	congou	30	35
15	Deeside	200	69	hf-ch	bro pek	3795	75
16	Do	202	55	do	pekoe	5500	52 bid
17	Fernands	204	32	do	pekoe No. 1	1600	46 bid
18	Do	206	5	ch	unassorted	500	41
19	Kadienlena	207	34	do	bro pek	3060	60
20	Do	209	40	do	pekoe	3200	43
21	Do	211	22	do	pek sou	1760	39
22	Do	213	1	do	dust	130	28
23	Labugama	214	20	hf-ch	bro pek	800	61
24	Do	216	24	do	pekoe	960	45
25	Do	218	15	do	pek sou	600	40
26	Alliady	220	13	ch	bro pek	1690	55
27	Do	222	12	do	pekoe	1320	40
28	Do	224	14	do	pek sou	1400	36
29	Ivies	226	18	hf-ch	bro pek	900	62
30	Do	228	24	do	pekoe	1200	45
31	Do	230	16	ch	pek sou	1140	40
32	Do	230	2	hf-ch	dust	140	27
33	Brownlow	233	15	ch	bro pek	1725	72
34	Do	235	17	do	pekoe	1615	52
35	B T	237	10	do	pek sou	875	42
36	Do	239	21	do	unassorted	1890	34
37	Do	241	2	hf-ch	congou	90	35
38	Do	242	2	do	dust	120	29
39	Kanda-nuwara	243	43	ch	pek sou	3440	40
40	Do	245	14	do	sou	1190	41
41	K B	247	1	do	sou	100	32
42	Beaumont	248	1	hf-ch	young hyson	59	72
43	Do	249	1	do	hyson	62	48
44	Galkaode-watte	250	22	ch	bro pek	2200	72
45	Do	252	27	do	pekoe	2430	51
46	G K W	254	1	do	bro tea	90	40
47	Do	255	2	do	dust	160	29
50	P G K	260	4	ch	unassorted	316	39
51	Do	261	2	do			
			2	hf-ch	sou	212	36
52	Do	262	5	do	dust	390	29
53	Maddege-dera	263	12	do	youug hyson	690	43 bid
54	Do	265	6	do	hyson	288	39

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 18th June the undermentioned lots of Tea (129,700 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Descriptien.	Weight lb.	c.
1	Walahan-duwa	10	3	hf-ch	fans	180	38
	S P A	12	3	do	pek	180	35
	Do	14	2	do	sou	100	33
	Do	16	2	do	bro mix	100	32
5	Do	18	1	do	dust	77	29
6	Wevegoda	20	1	do	fans	60	34
7	Do	22	2	do	bro mix	100	34
8	Harangalla	30	18	ch	bro pek	1800	56
9	Do	32	15	do	pekoe	1425	42
10	Do	34	12	do	pek sou	1080	39

Lot No	Mark	Box No	Packages		Description	Weight lb.	c.
11	Midlothian	36	15	hf-ch	bro pek	825	56
12	Do	38	18	ch	pekoe	1710	45
13	A K	40	8	do	bro tea	800	42
14	Do	42	25	hf-ch	red leaf	1250	29
15	C	44	1	do	dust	75	24
16	C	46	2	do	red leaf	100	25
17	C	48	2	do	congou	100	30
23	Leangapella	60	4	do	or pek	240	50
24	Do	62	5	do	pekoe No. 1	275	41
25	Do	64	5	do	dust	450	29
26	Ancoombra	65	6	ch	bro pek	720	52 bid
27	Do	68	7	do	pekoe	784	40 bid
28	Do	70	6	do	pek sou	672	38
29	Ragalla	72	95	hf-ch	bro pek	5322	77
30	Do	74	93	ch	pekoe	8556	55
31	Do	76	71	do	pek sou	6035	44
32	Do	78	12	do	dust	960	30
33	Do	80	6	do	bro tea	498	36
34	Hatton	82	11	ch	bro pek	1100	62
35	Do	84	10	do	pekoe	900	48
36	Do	86	17	do	pek sou	1445	40
37	Do	88	1	do	sou	85	34
38	Do	90	1	do	dust	130	28
39	H P	92	3	hf-ch	pek dust	225	29
40	N A	94	39	do	bro pek	1950	60
41	Do	96	34	do	pekoe	1700	44
42	Do	98	55	do	pek sou	3025	39
43	Do	100	1	do	congou	58	33
44	Do	102	1	do	bro pek dust	84	33
45	Do	104	1	do	pek sou dust	82	27
46	Queenwood	106	17	ch	bro pek	1700	66
47	Do	108	16	do	pekoe	1600	50
48	Theydon Bois	110	6	do	bro pek	600	63
49	Do	112	12	do	pekoe	1080	50
50	Do	114	18	do	pek sou	1530	39
51	Do	116	4	do	sou	340	34
52	R M	118	3	do	bro pek	300	43
53	Do	120	1	do	pekoe	100	36
54	Dehiowitta	122	4	do	dust	560	23
55	V O	124	6	do	bro tea	660	27
56	I G	126	1	do	bro tea	90	33
57	S S S	128	3	do	pek sou	330	34
58	Yataderia	130	48	do	pek sou	4368	36
59	Do	132	35	do	bro tea	2800	35
60	Do	134	14	do	pek fan	1400	28
61	Theberton	136	43	hf-ch	bro pek	2150	51
62	Do	138	26	do	pekoe	1300	40
63	Do	140	30	do	pek sou	1500	38
64	Do	142	4	do	pek dust	200	28
65	Do	144	7	do	congou	350	33
66	P D M	146	1	do	dust	60	28
67	Do	148	1	ch			
			1	hf-ch	sou	160	39
68	Monrovia	150	4	ch	bro pek	415	59
69	Do	152	4	do	pekoe	400	44
70	Do	154	7	do	pek sou	700	39
71	Do	156	1	hf-ch	unassorted	50	36
72	Do	158	2	ch			
			1	hf-ch	sou	240	34
73	H	160	3	ch	dust	220	23
74	H	162	2	do	dust	306	26
75	H	164	1	hf-ch			
			1	ch	fans	95	33
76	R	166	15	pkg	pekoe	979	32
77	C B	168	3	hf-ch	dust	225	31
78	Avisawella	170	3	ch	unassorted	315	30
79	Meeria-badde	172	1	hf-ch	bro pek	50	34
80	Do	174	1	do	dust	70	27
81	Bismark	176	3	ch	sou	300	35
82	Do	178	3	do	fans	390	40
83	Do	180	3	do	dust	465	28
84	B	182	22	hf-ch	or pek	1100	68 bid
85	O G A	184	3	ch	bro pek	300	54
86	Do	186	4	do	pekoe	380	41
87	Do	188	3	do	pek sou	270	37
88	Deaculla	190	11	hf-ch	or pek	550	69
89	Do	192	11	ch	pekoe	1100	46
90	Do	194	5	do	pek sou	500	39
91	Do	196	1	hf-ch	bro mix	50	32
92	Do	198	1	do	dust	70	24
93	Malvern	200	3	do	or pek	150	61
94	Do	202	3	ch	pekoe	300	46
95	Do	204	1	do	pek sou	100	38
96	Bambrakelley and Dell	206	8	hf-ch	hyson	400	40
97	Do	208	3	do	young hyson	150	55
98	Lygrove	210	12	ch	bro pek	1200	59
99	Do	212	4	do	or pek	400	55
100	Do	214	29	do	pekoe	2900	45
101	Do	216	15	do	pek sou	1500	29
102	Middleton	218	16	hf-ch	bro pek	896	71
103	Do	220	13	ch	pekoe	1300	56
104	Do	222	2	hf-ch	dust	150	28

Lot No.	Mark	Box No	Packages		Description	Weight per lb	c.
105	M	224	19	do	bro pek	1064	49
106	M	226	12	ch	pekoe	1200	40
107	Debatgama	228	20	hf-ch	or pek	1045	54
108	Do	230	8	do	pekoe	680	41
109	Do	232	23	do	pek sou	1840	40
110	Do	234	7	do	bro mix	595	34
111	Do	236	2	do	or dust	220	39
112	S P S M	238	1	ch	bro pek	107	51
113	Do	240	1	do	pekoe	101	40
114	Do	242	2	do	pek sou	214	38
115	Barra	244	2	hf-cb	or pek	100	44
116	Do	246	1	do	pekoe	45	33
117	Do	248	12	do	pek sou	600	33
118	Do	250	45	do	oolong No. 1	2250	out
119	Do	252	57	do	do ,, 2	2565	out
120	Kenmare	254	27	do	bro pek	1485	72
121	Do	256	30	do	or pek	1500	57
122	Do	258	33	do	pek sou	1485	46
123	Goomera	260	7	ch	pek sou	742	40
124	Do	262	1	do	sou	90	31
125	Do	264	5	do	dust	700	28
126	Do	266	1	do	red leaf	100	25
127	Ingestre	268	16	hf-cb	bro or pek	960	76
128	Do	270	20	do	bro pek	1000	76
129	Do	272	30	ch	pekoe No 1	2700	51
130	Do	274	12	do	do ,, 2	1020	51
131	Do	276	13	do	pek sou	1300	44
132	Barra	278	32	hf-ch	or pek	1600	49 bid
133	Do	280	35	do	pekoe	3150	35 bid

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 18th June, the undermentioned lots of Tea (66,365 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	W	8	10	hf-ch	sou	550	28
2	W	9	7	do	pek fans	420	26
6	M A H	13	3	ch	bro tea	300	33
7	Do	14	3	do	congou	270	30
8	Do	15	1	do	red leaf	90	25
9	Hiralouvah	16	6	do	sou	575	35
10	Burnside	17	21	hf-ch	bro pek	1260	61
11	Do	18	38	do	pekoe	1900	49
12	Do	19	6	do	pek sou	300	39
13	Hattanwella	20	6	do	pekoe	300	46
14	Do	21	36	do	pek sou	1800	40
15	Do	22	5	do	sou	250	32
16	Do	23	2	do	dust	106	26
17	Ettapolla	24	10	do	bro pek	560	60
18	Do	25	20	do	pek sou	1000	41
22	Depedene	29	16	do	bro pek	800	56
23	Do	30	10	do	pekoe	500	37
24	Do	31	13	do	pek sou	650	35
25	Do	32	17	do	bro tea	850	34
26	H D	33	6	do	bro tea	300	31
27	Do	34	10	do	bro mix	500	30
28	H H	35	4	ch	fans	439	36
29	Do	36	10	do	red leaf	865	30
30	Madde	37	4	do			
			1	bf-ch	dust	403	27
31	Do	38	1	do	red leaf	42	25
32	Allakolla	39	24	do	bro pek	1560	60
33	Do	40	29	do			
			7	ch	pekoe	2365	45
34	Do	41	40	hf-ch			
			13	ch	pek sou	3365	40
35	C A	42	10	hf-cb	unassorted	409	42
36	Do	43	2	do	bro mix	90	35
37	Do	44	1	do	dust	68	28
38	South Wanna Rajah	45	22	do	or pek	1100	77
39	Do	46	25	ch	pekoe	2500	53
40	Do	47	18	do	pek sou	1800	42
41	Marymont	48	7	hf-ch	unassorted	336	35
42	Hattanwella	49	20	do	bro or pek	1000	56
43	Do	50	15	do	pekoe	750	46
44	Do	51	6	do	pek sou	312	40
45	Do	52	2	do	sou	112	33
46	Do	53	1	do	dust	60	25
47	A	54	1	do	pekoe	50	31
48	A	55	2	ch	red leaf	220	26
49	A	56	4	do	dust	385	26
50	Goonambil	57	20	bf-ch	bro pek	1300	64
51	Do	58	24	do	pekoe	1440	48
52	Do	59	30	do	pek sou	1650	40
53	Do	60	4	do	unassorted	220	38
54	Do	61	2	pkg	dust	160	34
55	Do	62	4	do	fans	252	38

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
56	H G A	63	14	cb	bro pek	1568	60 bid
57	Do	64	23	do	pekoe	2415	48
58	Do	65	27	do	pek sou	2700	40
59	Do	66	3	do	bro mix	345	38
60	Do	67	5	do	dust	400	28
61	M K	68	18	do	bro pek	1956	55
62	Do	69	13	do	pekoe	1300	42
63	Do	70	30	do	pek sou	3150	38
64	Lauderdale	71	13	do	bro pek	1300	60
65	Do	72	20	do	pekoe	2000	47
66	Do	73	35	do	pek sou	3500	42
67	Morningside	74	9	hf-ch	bro pek	450	53 bid
68	Do	75	8	do	pekoe	400	40 bid
69	Do	76	10	do	pek sou	500	38
70	Do	77	3	do	dust	170	28
71	Do	78	1	do	red leaf	50	25
72	E D P	79	1	do	bro pek	50	47
73	S	80	14	do	bro pek	700	51 bid
74	S	81	15	do	pekoe	750	37 bid
75	S	82	13	do	pek sou	622	35
76	S	83	2	do	bro pek sou	112	27
77	S S	84	1	ch	dust	112	25

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 25th June, the undermentioned lots of Tea (60,295 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs,		Description.	Weight. lb.	c.
1	Cruden	266	3	ch	bro mix	300	38
2	Do	267	2	do	dust	150	29
3	Albion	268	12	do	bro pek Nos. 15-09 1520	1080	64 bid
4	Do	270	12	do	pekoe Nos. 1521-1532	960	45
5	Do	272	23	do	bro pek Nos. 1533-1555	2070	65 bid
6	Do	274	19	do	pekoe Nos. 1556-1574	1520	46 bid
7	Do	276	26	do	pek sou Nos. 1575-1600	2080	40
8	Do	278	4	do	dust	475	32
9	Hangran-oya	279	10	do	bro pek	1100	56
10	Do	281	10	do	pekoe	950	46
11	Do	283	16	do	pek sou	1520	39
12	Do	285	3	do	congou	270	35
13	Do	286	3	do	dust	450	29
14	Orange Fild	287	12	hf-cb	bro pek	600	53
15	Do	289	36	do	pekoe	1650	42
16	Do	10	5	do	sou	280	30
17	Eila	11	10	ch	or pek	1000	49
18	Do	13	8	do	pekoe	640	38
19	Do	15	1	do	pek dust	125	30
20	Temple-stowe	16	52	hf-ch	or pek	2704	64 bid
21	Do	18	21	ch	pekoe	1890	44
22	Do	20	29	do	pek sou	2755	41 bid
23	Do	22	6	hf-ch	bro tea	420	35
24	Do	23	5	do	dust	435	30
25	Mocha	24	43	do	bro pek	1935	72
26	Do	26	22	cb	pekoe	1980	52
27	Do	28	30	do	pek sou	2550	45
28	Do	30	14	do	sou	1215	40
29	Whyddon	32	28	hf-ch	bro or pek	1400	62
30	Do	34	48	do	pekoe	1920	46
31	Great Valley	36	39	do	bro pek	1950	62 bid
32	Do	38	22	ch	pekoe	2090	45 bid
33	Do	40	36	do	pek sou	3240	39 bid
34	Denegama	42	2	do	tea dust	144	29
35	Do	43	2	do	congou	100	36
36	Do	44	1	do	red leaf	50	28
37	Maddege-dara	45	22	do	bro pek	1232	52
38	Do	47	23	do	pekoe	1058	40
39	Do	49	2	do	sou	76	36
40	Do	50	2	do	dust	136	28
41	Alnoor	51	3	do	bro pek	120	54 bid
42	Do	52	7	do	pekoe	280	44
43	Do	54	6	do	pek sou	240	40
44	Do	56	2	do	dust	100	30
45	Do	57	2	do	congou	80	35
46	Cruden	58	1	box	young hyson	20	66
47	Do	59	2	do	No. 1 hyson	80	57
48	Do	60	1	do	hyson	20	42
49	Do	61	1	do	bro tea	30	36
50	Lawrence	62	7	ch	sou	700	41
51	Do	64	6	do	bro mix	630	37
52	Do	66	9	hf-ch	dust	630	33

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
53	Nahaketti-ya	67	5 ch	bro pek	500	58
54	Do	69	11 do	pekoe	1100	45
55	Do	71	1 do	sou	100	37
57	Tangapu Tottam	74	12 do	bro pek	1200	55
58	Do	76	13 do	pekoe	1235	42 bid
59	Do	78	7 do	pek sou	700	34 bid
60	Do	80	2 do	dust	280	27
61	M-Tenne	81	3 do 3 hf-ch	bro pek	510	53
62	Do	83	1 do 3 ch	pek No. 1	255	39
64	Do	85	9 do	pek No. 2	900	38
65	Do	87	3 do	pek sou	300	35
66	Do	88	2 do	sou	200	32
67	Do	89	3 hf-ch	dust	225	27
68	V P		6 do	congou	300	31
69	Do		2 do	red leaf	88	22

☞ "Not arrived" parcels are omitted.

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 30th May:—

Ex "Goorkha"—Haputale, 1c 107s; 2c 1t 103s; 1b 95s; 1b 111s; 1 bag 108s; 2 bags 87s 6d.

Ex "Bellerophon"—Balmoral, 2c 98s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 6th June:—

Ex "Goorkha"—Haputale, 3 bags 98s.

Ex "Titan"—Gonakelle, 1b 1t 99s.

Ex "Orion"—Gowerakellie, 1c 104s; 1c 101s; 1b 96s; 2b 92s; 1b 91s 6d; 1b 100s.

Ex "Ormuz"—Moragalla, 27 bags 96s; 6 87s 6d; 7 70s 6d; 2 83s 6d; 7 93s.

Ex "Bellerophon"—Forres, 1c 94s.

Ex "Parramatta"—Kotiyagalla, 1c 94s.

Ex "Clan Matheson"—Ouvah GH, 1c 94s.

Ex "Dacca"—St. George, 1c 1b 93s.

Ex "Bellerophon"—Killarney, 1t 1b 93s.

Ex "Dorunda"—JJV&Co. PB, 7 bags 96s 6d.

Ex "Orion"—(DN), 3b 95s; 2b 86s 6d; 1c 1t 82s 6d.

CEYLON CINCHONA SALES IN LONDON.

(*From Wilson Smithett & Co.'s Circular.*)

MINCING LANE, June 6th, 1890.

SUCCIRUBRA.

Mark	Natural Stem	Renewed	Root
Eskdale	3d	6d	...
Fetteresso	3d to 3½d	4d	...
O B E C, St. Combs, Hybrid	3½d to 6d	5d to 7½d	...
O B E C, Naranghena	2½d	3d to 3½d	2½d
,, Nilloomalley	3d	4d	...
Ella Oya	2½d to 3d	4d to 4½d	...
Haputale, mixed	3½d		..
Ostumbe	...	3½d	...
Maha Uva	3½d	7d	...

OFFICINALIS.

Mark	Natural Stem	Renewed	Root
Eskdale	3d to 4½d	8½d to 9d	7d
O B E C, Delmar	...	6d to 6½d	5½d
,, St. Combs, Ledger	4½d to 8½d	...	...
,, Naranghena, Ledger	3d to 8½d	...	7½d
,, Loolcondura	2½d to 3d	...	...

CEYLON CACAO SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, June 6th, 1890.

Ex "Nepaul"—Eriagastenne, 6 bags 112s 6d. Maria, 6 bags 112s.

Ex "Siren"—Bulawatte, 14 bags 79s.

Ex "Orient"—Anniewatte, 10 bags 85s; 8 bags 75s.

Ex "Port Augusta"—Eriagastenne, 4 bags 95s.

Ex "Ulysses"—Eriagastenne, 1 bag 95s.

Ex "Port Augusta"—Goonambil, 6 bags 95s.

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, May 30th, 1890.

Ex "Oroya"—Wattagalla, 3 cases 2s 5d; 3 1s 6d; 4 1s 4d: 5 1s 5d; 3 1s 1d.

Ex "Clan Grant"—Nawanagalla, 5 cases 1s 6d; 10 1s 2d; 1 10½d; 1 1s 1d.

CINNAMON SALES.

London, 19th May, 1890.

A. S. G. P. Kaderane.—32 bales 1s 5d; 18 bales 1s 4d: 22 bales 1s 3d; 6 bales 1s 2d; 50 bales 1s 1d; 6 bales 11d; 3 bales 10d: 2 bales 9d: 6 bales 8d; 2 bales 7d; 4 bales 6½d; 2 boxes and 10 bags clippings 6d.

F. S. W. S. Kaderane.—1 bale 1s 7d; 6 bales 1s 4d; 13 bales 1s 3d; 6 bales 1s 2d; 49 bales 1s 1d; 5 bales 1s; 6 bales 10d; 2 bags quills 9d; 2 bags clippings 7½d; 1 bale, 2 bags cuttings and 7 bags clippings 7d; 2 bales, 1 box and 4 bags clippings 6½d; 1 bag clippings 5½d.

F S. K. Kaderane.—1 bale 1s 5d; 1 bale 1s 4d; 3 bales 1s 3d; 10 bales 1s 2d; 7 bales 1s 1d; 6 bales 11d; 2 bales 10d; 5 bales 9d; 1 bag cuttings and 2 bags clippings 7½d: 6 bales 7d; 4 bales and 1 box 6½d; 7 bags clippings 6d.

J. D. S. R.—Kadirane.—1 bale and 1 parcel 1s 3d; 6 bales 1s 2d; 5 bales 1s 1d; 2 bales 11d; 1 bale 10d; 1 bale and 1 parcel 8d; 3 bags cuttings 7d; 3 bales and 1 parcel 6½d; 1 bale 6d.

F. B. Franklands.—6 bales 1s 3d; 3 bales and 1 parcel 1s 2d; 3 bales and 1 parcel 1s 1d; 1 bale 11d; 1 bale, 2 bags broken and 2 bags quillings 6½d; 1 bag 6d.

D. B. Ekelle.—2 bales 7½d; 20 bales 7d; 25 bales 6½d; 8 bales 6d; 3 bales 5¾d; 2 bales 5½d.

G. D. C. Ekella.—12 bales 1s; 13 bales and 1 box 7½d; 9 bales 6d.

R. Kaderane.—1 bale 11d; 1 bale 10½d; 6 bales 7½d; 9 bales 7d; 20 bales and 1 bag 6½d; 5 bales and 1 box 6d; 7 bags 5¾d; 1 bale 5½d; 1 parcel 5d.

A. and S. Ekelle.—8 bales 9d; 27 bales 7½d; 49 bales 7d; 27 bales 6½d; 1 box and 1 bag 6d; 4 bales 5½d.

V. B. Ekelle.—53 bales 7½d; 76 bales 7d; 41 bales 6½d; 2 boxes 6¼d; 9 bales 6d; 3 bales 5¾d.

C. P. H. & Co.—11 bales 7½d: 14 bales 7d; 5 bales 6½d: 1 box 6¼d.

S. D. A. R. Kaderane K.—4 bales 1s; 1 bale 11d; 1 box and 10 bags quillings 6½d.

C. H. De S. P. K. W.—23 bales 7½d; 8 bales 7d; 7 bales and 1 box 6.d; 4 bales 6d.

C. H. De S. Koottariavalle.—6 bales 8d; 16 bales 7½d; 5 bales 7d.

C. H. De S. Salawa.—4 bales 8d; 17 bales 7½d; 15 bales 7d; 6 bales 6½d; 1 box 6¼d; 1 bag 6d.

C. H. De S. Andeamblam.—5 bales 9d; 2 bales 8d; 1 bale 6½d.

C. H. De S. Kaderane.—7 bales 10d; 4 bales 8d; 2 bales and 1 bag 6½d; 2 bags 6¼d.

C. H. De S. Kandevalle.—4 bales 8d: 6 bales 7½d; 3 bales 7d; 4 bags 6¾d; 3 bales 6½d.

C. H. De S. Ratmalane.—4 bales 7½d; 9 bales 7d; 4 bales 6½d; 1 bale 6d.

C. H. De S. Kuruwitte. 3 bales 8d; 6 bales 7½d; 4 bales 7d; 3 bags 6¾d; 3 bales and 1 box 6½d.

C. H. De S. Morotto.—1 bale 7½d; 5 bales 7d; 3 bales 6½d.

C. H. De S., B K O (O in diamond.)—14 bales 7½d; 9 bales 7d; 5 bales 6½d; 1 box 6¼d; 1 bale 6d.

C. H. De S. Hiripittiya.—1 bale 8d; 1 bale 7d.

C. H. De S. Innegaltuduwa.—4 bales 7½d; 7 bales 7d; 2 bales 6½d; 1 bag 6¼d.

C. H. De S. Mattegodde.—1 bale 7d.

S. & Co., J D A (in triangle) Ekelle.—1 bale 8½d; 17 bales 8d; 18 bales 7½d; 16 bales, 1 parcel and 7 bags pieces 7d; 29 bales, 1 parcel, 1 box and 20 bags cuttings 6½d; 11 bags cuttings 6¼d; 19 bales and 1 parcel 6d 2 bags pieces 5½d; 9 bags pieces 5¼d; 180 bags chips 2½d; 100 bags chips 2⅝d; 2 bags dust 1⅜d.

S. & Co., J D A Maradana.—13 bales and 1 box 5¾d.

S (in diamond) Ekelle.—5 bales 7½d; 12 bales 7d.

A S D D D Kaderane.—3 bales 11d; 9 bales 10d; 6 bales 9d; 6 bales 8½d; 6 bales 8d; 4 bales 7d; 1 box 6½d; 3 bales 6d.

A. & Co. Ekelle.—1 bale 1s 2d; 1 bale 1s; 4 bales 10½; 1 bale 9d; 1 bale 7d; 2 bales 6½d; 1 bag 6d.—Local "Examiner."

No. 18.] COLOMBO, AUGUST 23, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 6th Aug., the undermentioned lots of Tea (32,966 lb.) which sold as under:—

Lot No.	Mark.	Box No.	Pkgs.		Description.	Weight lb.	c.
1	N	2	3	ch	bro pek	390	30
2	N	3	6	do	fane	775	26
3	N	4	1	do	pek fans	140	28
4	M A H	5	5	do	congou	450	28
5	Do	6	1	do	red leaf	90	18
12	Yahalakelle	13	3	do	unassorted	150	31
13	Do	14	3	do	red leaf	150	24
14	Do	15	1	do	dust	80	28
15	Forest Hill	16	13	ch	bro pek	1300	53
16	Do	17	10	do	pekoe	900	39
17	Do	18	5	do	pek sou	450	36
18	Do	19	1	do	dust	130	26
19	Kuruwitte	20	8	hf-ch	bro pek	464	61
20	Do	21	9	do	pekoe	450	43
21	Do	22	10	do	pek sou	500	38
22	Do	23	5	do	unassorted	260	34
23	Do	24	1	do	congou	46	31
24	Do	25	1	do	dust	72	26
25	Mousa	26	18	ch	bro pek	1980	49
26	Do	27	39	do	pekoe	3910	39
27	Do	28	2	do	uoassorted	220	32
28	Do	29	1	do	sou	125	27
31	Vincit	32	5	do	bro or pek	500	52
32	Do	33	4	do	pekoe	400	37
33	Do	34	4	do	pekoe	400	
34	Do	35	5	do	pek sou	500	33
35	Do	36	2	do	congou	190	25
36	Brae	37	13	do	bro pek	1300	51
37	Do	38	20	do	pekoe	2000	40
38	Do	39	2	do	sou	200	34
39	P	40	2	hf-ch	bro pek	88	70
40	P	41	2	do	pekoe	100	47
41	P	42	7	do	pek sou	359	38
42	P	43	3	do	bro tea	156	40
43	P	44	2	do	unassorted	84	42
44	P	45	1	do	coogou	45	30
45	P	46	1	do	dust	81	26
46	Depedene	47	7	do	bro pek	400	52
47	Do	48	10	do	pekoe	540	43
48	Do	49	18	do	pek sou	1029	37
49	H D	50	6	do	bro mix	300	21
50	Do	51	22	do	bro tea	1100	34
51	Do	52	2	do	dust	180	26
52	W	53	8	do			
			2	ch	bro tea	749	20
53	W	54	3	hf-ch			
			1	ch	red leaf	212	23
54	W	55	3	do	dust	360	23
55	W W	56	14	hf-ch	pek sou	728	33
56	I P	57	8	ch	bro tea	760	20
57	D G A	58	4	hf-ch	pek fans	240	30
58	D	59	1	do	pek sou	45	32

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 6th Aug., the undermentioned lots of Tea (54,497 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Descriptien.	Weight lb.	c.
1	Elfindale	6	5	hf-ch	dust	250	[illegible]
2	Do	8	41	do	sou	1640	23
3	Riseland	10	3	ch	bro pek	300	40
4	Do	12	5	do	pekoe	450	36
5	Do	14	6	do	pek sou	480	35
6	Do	16	5	do	bro pek sou	420	32
7	R M	18	1	ch			
			1	hf-ch	bro pek	150	47
8	Do	20	1	ch			
			1	hf-ch	bro pek sou	150	31
9	Do	22	1	do	bro mix	60	25
10	Ouvah-kelle	24	1	hf-ch	dust	65	26
	The Yatiyantota Tea Co., Limited.)						
11	Polatagama	26	30	hf-ch	bro pek	1500	58
12	Do	28	60	do	pekoe	2460	45
13	Do	30	80	do	pek sou	3280	37
14	Asgeria	32	2	ch	bro tea	200	28
15	Mooaco	34	1	do	dust	170	26
16	C	36	12	do	bro tea	1512	39
17	Kirimettia	38	1	do	bro tea	104	32
18	Do	40	1	do	red leaf	104	23
19	Beacons-field	42	17	ch	bro pek, metal packages	1700	54 bid
20	Do	44	23	do	pekoe, metal packages	2070	44
21	Do	46	1	do	pekoe, metal packages	90	42
22	Do	48	24	do	pek sou, metal packages	2160	27
23	Do	50	15	do	fans, metal packages	1500	34
24	Do	52	14	hf-ch	or pek	630	55
25	Do	54	17	do	dust	1275	26
26	L	56	1	do	or pek	40	36
27	L	58	1	do	pek sou	31	35
28	L	60	1	do	dust	37	20
29	M	62	6	ch			
			1	hf-ch	bro tea	593	20
30	Faroham	64	26	do	bro or pek	1300	60
31	Do	66	21	do	pekoe No. 1	945	45
32	Do	68	12	do	pekoe	540	42
33	Do	70	12	do	pek sou No. 1	540	37
34	Do	72	23	do	pek sou	1035	37
35	Do	74	3	do	fans	180	29
36	Do	76	5	do	bro tea	250	26
37	Middleton	78	27	do	bro pek	1512	67
38	Do	80	13	ch	pekoe	1300	52
39	Rambodde	82	5	hf-ch	sou	250	33
40	Atherfield	84	3	do	dust	240	26
41	Do	86	5	do	bro tea	250	34
42	Palamcotta	88	2	do	pek dust	170	28
43	Do	90	2	do	dust	170	26
44	Do	92	1	ch	red leaf	105	22
45	Waveodon	94	1	do	dust	154	22
46	D	96	1	ch			
			5	hf-ch	pekoe No. 1	374	25
47	D	98	3	ch			
			1	hf-ch	pekoe No. 2	360	20
48	D	100	4	do	pek sou	190	22
49	D	102	4	ch	bro mix	520	14
50	K C	104	4	hf-ch	bro pek sou	260	31
51	Do	106	9	do	bro pek fans	585	30
52	Do	108	2	do	bro pek dust	150	26
53	Moralioya	110	3	do	bro pek	150	47
54	Do	112	4	do	pekoe	200	38
55	Do	114	2	do	pek sou	100	36
56	Do	116	4	do	sou	200	34
57	Do	118	2	do	uoassorted	100	37
58	Do	120	1	do	bro tea	40	27
59	Do	122	1	do	pek dust	51	36
60	Glenorchy	124	16	do	bro pek	960	72
61	Do	126	29	do	pekoe	1595	51
62	Avisawella	128	2	ch	unassorted	210	37
63	Ambla-kande	130	9	do	or pek	990	47
64	Do	132	25	do	pekoe	2250	37
65	Do	134	3	do	bro mix	270	26
66	P B	136	21	hf-ch	or pek	1044	47 bid
67	Keooing-ton	138	22	do	bro pek	1100	44
68	Do	140	20	do	pekoe	900	35
69	Do	142	12	do	pek sou	540	33
70	Do	144	1	do	unassorted	40	26
71	Do	146	2	do	dust	110	24
72	Do	148	4	do	cougou	160	27
73	X (in estate mark)	150	2	do	pekoe	90	31
74	Marl-borough	152	5	ch	bro pek	500	66
75	Do	154	9	do	pekoe	900	48
76	Do	156	3	do	pek sou	300	38
77	Do	158	1	do	dust	100	26
78	Melrose	160	2	do	pek dust	318	27
79	Do	162	3	do	congou	360	28
80	Bandara-polla	164	18	hf-ch	or pek	900	58
81	Do	166	20	do	bro pek	1000	50
82	Do	168	32	do	pekoe	1600	41
83	Do	170	37	do	pek sou	1665	36
84	Do	172	18	do	pek sou	810	36
85	Do	174	2	do	dust	140	26

Messrs. E. Benham & Co. put up for sale at the Chamber of Commerce Sale-room today, 13th Aug., the underentioned lots of Tea (5,360 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Wangie Oya	18	10 hf-ch	bro or pek	500	60
2	Do	19	16 ch	or pek	1760	48 bid
3	Do	20	13 do	pekoe	1300	42
4	Do	21	8 do	pek sou	800	37

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today 13th Aug., the undermentioned lots of Tea (41,740 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Harrow	15	5 hf-ch	bro pek	300	52 bid
2	Do	17	6 do	pekoe	330	39 bid
3	Do	19	2 do	pek sou	106	34
4	Do	20	1 do	bro tea	80	27
5	A K A C	21	15 do	bro pek	750	53 bid
6	Do	23	48 do	pekoe	2400	40
7	Do	25	9 do	sou	450	35
8	Do	27	2 do	dust	140	24
9	Do	28	1 do	fans	60	29
10	Nahalma	29	34 do	bro pek	1870	53
11	Do	31	24 ch	pekoe	2400	37 bid
12	Do	33	19½ do	pek sou	1045	34
13	Do	35	3 hf-ch	dust	195	27
14	Torrington	36	19 do	bro or pek	1140	60 bid
15	Do	38	13 ch	bro pek	1430	47 bid
16	Do	40	22 do	pekoe	2200	42 bid
17	Do	42	22 do	pek sou	1980	37
18	Do	44	2 hf-ch	dust	160	27
19	Ettapolla	45	8 do	bro pek	480	51 bid
20	Do	47	14 do	pekoe	700	38
21	Agar's Land	49	31 do	or pek	1550	55
22	Do	51	21 do	pekoe	1050	42 bid
23	Do	53	15 do	pek sou	675	38
24	S A	55	3 do	sou	135	35
25	Do	56	2 do	dust	140	29
26	Do	57	2 do	bro mix	104	30
38	Kotagala	77	11 do	bro pek	770	57 bid
39	Do	79	22 do	pekoe	1330	43
40	Do	81	10 do	pek sou	600	35
41	Do	83	15 do	unassorted	1050	37
42	Do	85	2 ch	fans	180	28
43	S	86	12 hf-ch	unassorted	600	36
44	S	88	4 do	bro pek	190	51 bid
45	A A	89	13 ch	pekoe	1300	39
46	S	91	1 hf-ch	pek sou	27	27
47	A G C	92	1 ch	congou	100	20
48	Do	93	5 hf-ch	fans	300	29
49	Do	94	10 do	dust	700	24 bid

Mr. E. John put up for Sale at the Chamber of Commerce Sale-room today, 13th Aug., the undermentioned lots of Tea (25,335 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Ferlands	131	1 ch	unassorted	100	40
2	L	132	1 do	dust	177	18
3	L	133	1 hf-ch	red leaf	65	27
4	L	134	4 ch	congou	380	30
5	L	135	8 do	fans	1200	28
7	Alnoor	138	11 do	or pek	440	44
10	Do	144	2 do	unas	76	31
12	Do	146	1 do	dust	76	21
14	H J R	148	9 ch	bro pek	855	46 bid
15	Do	150	13 do	pekoe	1040	37 bid
16	Do	152	9 do	pek sou	720	34
17	Do	154	1 hf-ch	dust	75	25
18	Gonavy	155	18 ch	bro pek	1800	57 bid
19	Do	157	3 do	pekoe	270	51
20	Do	159	4 do	pek sou	360	48
21	Do	161	1 hf-ch	dust	75	27
22	F	162	14 ch	bro pek	1470	37
23	F	164	12 do	pekoe	1140	33
24	F	166	20 do	pek sou	1800	29
25	Kadienlena	168	22 do	or pek	1980	56
26	Do	170	22 do	pekoe	1760	43
29	Logan	175	18 hf-ch	bro pek	900	50
30	Do	177	18 do	pekoe	810	40
31	Do	179	44 do	pek sou	1980	36
32	Do	181	6 do	dust	360	28
33	Do	182	4 do	red leaf	180	27
34	Do	183	14 do	sou	630	33
35	Elston	185	16 do	dust	1120	26
35	A U	187	4 do	bro pek fans	336	24

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 13th Aug., the undermentioned lots of Tea (39,617 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	B V A	61	2 ch	red leaf	200	23
2	Do	62	4 hf-ch	dust	305	25
3	Narangoda	63	12 ch			
			1 hf-ch	unassorted	1250	36
4	Do	65	1 do	sou	50	26
5	Do	66	1 ch	dust	110	25
6	Wewesse	67	9 hf-ch	bro pek	495	51 bid
7	Do	68	12 do	pekoe	660	40
8	Do	69	14 do	pek sou	770	36
9	Do	70	3 do	sou	165	34
10	Do	71	3 do	pek fans	210	31
11	Do	72	1 do	dust	88	24
12	Hattan-wella	73	16 do	bro or pek	800	50 bid
13	Do	74	19 do	pekoe	950	42 bid
14	Do	75	38 do	pek sou	1900	36
15	Do	76	2 do	sou	96	30
16	Do	77	2 do	bro mix	80	26
17	Do	78	2 do	dust	110	25
18	Allakolla	79	19 do	bro pek	1235	54 bid
19	Do	80	26 ch	pekoe	2730	39 bid
20	Do	81	9 hf-ch	pek sou	540	36
21	Do	82	4 do	bro tea	280	31
22	Do	83	2 do	dust	130	24
23	St. Andrew's	84	13 do	or pek	858	66 bid
24	Do	85	11 do	bro pek	715	46
25	Do	86	36 do	pekoe	2304	41 bid
26	Heatherton	87	2 do	dust	165	26
27	Do	88	3 do	bro tea	135	27
28	R B S	89	18 do	or pek	1520	38 bid
29	Do	90	32 do	pekoe	2880	33
34	S W	95	3 do			
			1 ch	red leaf	212	25
35	Do	96	3 do	dust	360	23
36	O	97	1 hf-ch	dust	95	26
40	F	1	2 hf-ch	bro sou	84	24
41	E K	2	11 do	pekoe	575	34
42	H	3	1 ch	unassorted	75	27
43	H	4	5 hf-ch	bro tea	525	25
44	H	5	2 ch			
			1 hf-ch	congou	240	24
45	Hiralouvah	6	1 ch	bro pek No. 1	137	35 bid
46	Do	7	3 do	sou	355	35
47	Do	8	2 do	red leaf	225	26
48	Do	9	1 do	fans	123	31
49	Do	10	2 hf-ch	dust	144	26
50	Salawe	11	5 do	bro pek	280	56 bid
51	Do	12	8 do	pekoe	416	37 bid
52	Do	13	16 do	pek sou	800	37 bid
53	Do	14	11 do	sou	550	36
54	Do	15	4 do	unassorted	208	33 bid
55	Dalguise	16	13 ch	or pek	1170	51 bid
56	Do	17	22 do	pekoe	1760	36 bid
57	Do	18	16 do	pek sou	1440	32 bid
58	Do	19	2 do	dust	280	26
59	Do	20	3 do	sou	285	30
60	Do	21	2 do	bro tea	170	23
61	Do	22	2 do	unassorted	180	22
62	G	23	2 do			
			10 hf-ch	pekoe	762	31
63	Aadneven	24	4 ch	bro pek	400	56 bid
64	Do	25	6 do	pekoe	540	41 bid
65	K M O K	26	1 ch	bro tea	90	34 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 13th Aug., the undermentioned lots of Tea (70,617 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Ismalle	176	2 ch	dust	150	20
2	Do	178	1 do	bro mix	56	27
5	D	184	3 ch	bro pek	300	42
6	D	186	3 do	pek No. 1	300	37
7	D	188	8 do	pek No. 2	800	34
8	Tillyrie	190	25 ch	pek sou	2375	35
12	Nugagalla	198	13 do	bro or pek	650	65
13	Do	200	33 do	pekoe No. 1	1650	51
14	Do	202	2 do	pek sou	112	36
15	Do	204	3 do	dust	240	33
16	Traquair	206	8 do	bro pek	398	36
17	Do	208	2 do	pekoe	99	30
18	Do	210	11 do	pek sou	95	27
19	Harangalla	212	19 ch	bro pek	1900	43 bid
20	Do	214	11 do	pekoe	1045	33 bid
21	Do	216	7 do	pek sou	630	32
22	Portmore	218	40 do	bro pek	4400	56 bid
23	Do	220	21 do	pekoe	2100	42 bid

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
24	P	222	2 do	fans	242	26
25	D C	224	2 hf-ch	bro pek	100	45
26	Do	226	3 do	pekoe	150	40
27	Do	228	4 do	pek sou	200	37
28	Do	230	4 do	sou	200	34
29	Do	232	1 do	dust	55	26
30	Do	234	4 do	red leaf	200	25
31	Do	236	3 do	bro tea	150	31
32	Do	238	3 do	congou	150	37
33	Duckwari	240	7 ch			
			1 hf-ch	unassorted	750	27
34	Do	242	1 ch	congou	90	32
35	Do	244	2 do	fans	240	29
36	Do	246	1 do	red leaf	50	27
42	Pansala-tenne	258	3 do	congou	300	31
43	Do	260	5 hf-ch	dust	375	27
44	H E P	262	12 box	or pek	120	38 bid
47	Court Lodge	268	14 do	bro pek	840	73
48	Do	270	14 do	pekoe	70)	61
49	Do	272	22 do	pek sou	990	48
50	Do	274	1 ch	sou	90	42
51	Do	276	1 do	dust	149	31
52	Dehiowita	278	4 do	dust	560	28
53	Do	280	1 do	red leaf	95	23
54	Ingeria	282	6 do	pekoe	576	33
55	Do	284	1 do	bro mix	89	36
56	Hope	286	1 do	bro mix	126	20
57	Kirrimettia	288	1 do	red leaf	104	30
58	Galkaduwa	290	5 do	bro pek	500	42 bid
59	Do	292	7 do	pekoe	700	35 bid
60	Do	294	8 do	pek sou	800	33 bid
61	Thornfield	296	38 hf-ch	bro pek	2280	58
62	Do	298	22 ch	pekoe	2200	47
63	Do	300	2 hf-ch	pek dust	160	27
64	Bogahagoda-watte	302	4 do	bro pek	260	38
65	Do	304	7 do	pekoe	350	34
66	Do	306	6 do	bro mix	330	31
67	Do	308	8 do	bro tea	480	30
68	Do	310	2 do	faus	122	26
69	A	312	2 ch			
			6 hf-ch	bro tea	430	20
70	A	314	1 ch	pek dust	170	26
71	S P S M	316	1 do	pek sou	100	34
72	Amblakande	318	3 do	bro or pek	330	46 bid
73	Do	320	8 do	pekoe	720	37 bid
74	Do	322	1 do	bro mix	90	30
75	D C	324	22 hf-ch	pek sou	1100	38
76	Do	326	2 ch	dust	160	25
77	Avisawella	328	4 do	sou	420	33
78	Do	330	4 do	unassorted	420	33
79	Palmerston	332	7 hf-ch	bro pek	385	64
80	Do	334	9 ch	pekoe	900	46
81	Do	336	6 do	pek sou	600	38
82	Bramley	338	1 do	dust	100	26
83	Lagalla	340	2 hf-ch	congou	108	29
84	Do	342	9 do	bro mix	495	28
85	Do	344	6 do	dust	480	26
86	Clunes	346	25 do	bro pek	1250	46 bid
87	Do	348	52 do	pekoe	2655	37 bid
88	Do	350	37 do	pek sou	1850	35
89	Bearwell	352	35 ch	bro pek	3500	57 bid
90	Do	354	63 do	pekoe	5670	44 bid
91	Do	356	9 do	pek sou	810	37
92	Do	358	1 do	fans	112	26
93	Do	360	1 do	dust	167	25
98	Kenmare	370	15 do	bro pek	825	66
99	Do	372	27 do	or pek	1350	62
100	Do	374	23 do	pek sou	1035	48
101	Do	376	18 do	sou	720	37
102	Do	378	5 do	dust	375	25

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 20th Aug., the undermentioned lots of Tea (18,315 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Dunnottar	58	6 ch	or pek No. 1	660	42 bid
2	Do	60	5 hf-ch	or pek No. 2	325	57
3	Do	62	6 ch	bro pek No. 1	660	41
4	Do	64	15 hf-ch	bro pek No. 2	900	42
5	Do	66	3 ch	pekoe No. 1	330	37
6	Do	68	5 do	pekoe No. 2	500	39
7	Do	70	2 do	pek sou	200	30
8	Do	71	1 do	or pek	130	28
9	Do	72	1 do	dust	110	25
10	Nahalma	73	25 hf-ch	bro pek	1375	52
11	Do	75	18 do	pekoe	1800	35 bid
12	Do	77	13 do	pek sou	715	31
13	Do	79	2 do	dust	150	25
14	Woodend	80	11 ch	bro pek	1210	47
15	Do	82	13 do	pekoe	1300	35
16	Do	84	7 do	pek sou	665	33
17	Do	86	1 do	bro tea	115	29
18	Brae	87	21 hf-ch	bro pek	1155	45 bid
19	Do	89	14 ch	pekoe	1400	38
20	Do	91	4 hf-ch	bro pek fans	240	31
21	Do	92	2 do	dust	140	24
22	Hakrulugalla	93	6 ch	bro pek	600	42 bid
23	Do	95	13 do	pekoe	1170	36
24	Do	97	8 do	pek sou	800	30
25	Do	99	1 do	dust	150	24
26	P G A	1	6 hf-ch	bro pek	360	41 bid
27	Do	3	8 ch	pekoe	800	34
28	Do	5	3 do	pek sou	285	30
29	Do	6	1 hf-ch	dust	70	26

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 20th Aug., the undermentioned lots of Tea (37,143 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	J H W	10	1 hf-ch			
			1 box	dust	98	20
2	B W B	11	2 ch			
			1 hf-ch	unassorted	250	38
3	Do	12	2 ch			
			1 hf-ch	unassorted	200	32
4	G K W	13	1 ch	bro tea	90	33
5	Do	14	1 hf-ch	dust	80	20
6	Do	15	1 ch	red leaf	100	19
7	Galkande-watte	16	17 do	bro pek	1700	55 bid
8	Do	18	22 do	pekoe	1980	41
9	Abbotsford	20	15 do	bro pek	1425	61 bid
10	Do	22	14 do	pekoe	1120	45
11	Do	24	11 do	pek sou	880	36
12	Kadienlena	26	14 do	pek sou	1120	33 bid
13	Do	28	1 do	dust	130	25
14	Albion	29	24 do	bro pek	2280	56 bid
15	Do	31	26 do	pekoe	2210	45 bid
16	Do	33	22 do	pek sou	1870	36
17	Great Valley	35	32 hf-ch	bro pek	1600	52 bid
18	Do	37	16 ch	pekoe	1520	39 bid
19	Do	39	31 do	pek sou	2790	36
20	F	41	12 do	bro pek	1260	35
21	Do	43	12 do	pekoe	1140	29 bid
22	Do	45	31 do	pek sou	2790	26 bid
23	Madooltenne	47	9 do	bro pek	990	39
24	Do	49	9 do	pekoe	900	33
25	Do	51	7 do	pek sou	665	31
26	Lawrence	53	31 do	sou	3100	33
27	Do	55	1 do	bro mix	120	23
28	Do	56	4 hf-ch	dust	340	27

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 20th Aug., the undermentioned lots of Tea (22,472 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	B B	27	11 hf-ch			
			2 ch	pekoe	812	31
2	Diatalawa	28	3 hf-ch	bro pek	150	44
3	Do	29	19 do	unassorted	950	32 bid
4	K G A	30	9 ch	pekoe	720	33
5	Do	31	3 do	pek sou	240	29
6	Lyndhurst	32	8 ch	bro pek	800	52
7	Do	33	13 do	pekoe	1170	36 bid
8	Do	34	17 do	pek sou	1530	33
9	Harmony	35	15 hf-ch	bro pek	750	56
10	Do	36	23 ch	pekoe	2070	37
11	Do	37	5 do	pek sou	450	33 bid
12	Do	38	4 hf-ch	pek fan	280	27
13	Do	39	3 do	pek mix	135	28
14	Burnside	40	15 do	bro pek	900	45 bid
15	Do	41	18 do	pekoe	900	40
16	Do	42	1 do	pek sou	50	32
17	Do	43	1 do	dust	60	26
18	Madde	44	3 ch	dust	270	24
19	Do	45	1 hf-ch	red leaf	46	23
20	Caskieben	46	21 do	flowery pek	1155	50 bid
21	Do	47	23 ch	pekoe	2300	36 bid
22	Do	48	4 do	pek fans	300	29
23	South Wanna Rajah	49	8 do	bro pek	800	67
24	Do	50	25 do	pekoe	2500	46
25	Do	51	7 do	pek sou	700	40
26	M M	52	2 ch	pekoe	200	33

Lot No.	Mark	Box No.	Pkg.	Description	Weight lb.	c.
27	A A	53	2 do	pekoe	186	35
28	P S	54	5 do	pekoe	500	32
29	Do	55	5 do			
			1 hf-ch	red leaf	563	22
30	Do	56	4 ch			
			1 hf-ch	congou	303	27
31	Do	57	3 do			
			1 ch	dust	348	26
32	F	58	1 box			
			1 ch	fans	126	21
33	S	59	4 hf-ch	unassorted	208	33 bid
	C C		10 do	pekoe	520	34

CEYLON COFFEE SALES IN LONDON.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 25th July:—

Ex "Navigator"—Thotulagalla, 1b 106s; 3c 1t 105s; 5c 103s; 2c 1t 103s; 1t 97s 6d; 1c 1b 124s; 1c 1b 95s; 2 bags 99s 6d; 1 93s.

Ex "Navigator"—Alnwick, 2c 1b 107s 6d; 5c 1b 104s; 1c 99s; 1c 113s; 1c 90s; 2 bags 103s.

Ex "Orion"—Aldourie, 1b 86s; 1b 82s 6d; 1b 88s; 1b 98s; 1 bag 85s.

Ex "Canton"—Elmshurst, 2c 103s 6d: 2c 1b 98s 6d; 1 bag 94s; 2b 103s; 1t 93s 6d.

Ex "Clan Alpine"—Pittaratmalle, 1c 97s; 1b 107s; 1b 91s 6d; 1t 96s; 1 bag 101s; 1 90s.

Ex "Oopack"—Pittaratmalle, 1b 109s; 1t 1c 106s; 5c 103s 6d; 1c 100s 6d; 2b 114s; 1t 94s; 2 bags 103s 6d.

Ex "Scotia"—Delmar (OBEC), 1c 1b 100s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 1st August:—

Ex "Victoria"—Dambatenne, 2c 105s 6d; 3c 1b 102s 6d, 6c 101s; 1c 98s 6d; 1c 118s; 1t 93s; 1 bag 101s; 1 bag 99s. Gonamotava, 2c 108s 6d; 7c 105s; 1c 101s; 1c 127s 6d; 2 bags 105s.

Ex "Golconda"—Leangawelle, 2c 1t 108s; 5c 105s; 3c 1t 105s; 2c 100s 6d. 1c 127s 6d; 3 bags 105s 6d; 6 95s 6d. Ragalla, 1t 107s 6d; 7c 106s; 3c 100s 6d; 1t 126s 6d; 1 bag 106s; 4 95s 6d.

Ex "India"—Idulgashena, 1c 108s; 4c 100s 6d; 1b 127s. Ravenswood, 1c 1t 103s; 2c 1b 101s; 1b 95s; 1b 107s. Kahagalla, 5c 105s 6d; 1c 1b 106s 6d; 1c 1t 101s; 1t 128s; 1 bag 105s. Ragalla, 1t 106s; 5c 105s; 4c 1t 102s; 1t 115s; 1 bag 105s; 4 92s 6d.

Ex "Rohilla"—5c 106s 6d; 3c 1b 101s 6d; 1t 119s; 5 bags 96s. Ouvah JB, 2c 1b 105s; 10c 102s 6d; 2c 98s; 1t 118s; 1c 117s; 4 bags 102s. GA Ouvah, 3c 1b 106s; 5c 104s; 5c 104s 6d; 2c 104s; 2c 99s 6d; 1b 119s; 1c 120s; 1c 1t 95s 6d; 3 bags 102; 1 bag 100s. Gonomotava, 1c 1b 109s; 5c 106s; 1c 1b 106s 6d; 1c 1t 102s; 1c 126s; 1c 99s; 3 bags 106s.

Ex "India"—Kumaradola, 11 bags 91s 6d; 7 bags 87s; 1 bag 75s.

Ex "Golconda"—Blackwood, 1c 109s; 4c 106 6d; 1c 1b 100s 6d; 1b 128s 6d ; 2 bags 93s.

Ex "India"—Haldamulla, 2c 108s; 4c 105s; 1c 100s 6d; 1t 127s; 1 bag 104s.

Ex "Kaiser-i-Hind"—Meeriabedde, 1 bag 91s.

Ex "Chyebassa"—Tulloes, 1 bag 91s.

Ex "Peshawur"—St. Leonards, 2c 108s 6d ; 1c 1t s 6d; 1c 126.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett & Co.'s Circular.)

MINCING LANE, July 18th, 1890.

Mark	Natural Stem	Renewed	Root
Lanka	2d to 2½d	3½d to 4d	2½d to 3d
Yapame	1¾d	2½d	...
B, BW, D	2½d	...	3d
ECB, T in dia.	1½d to 3d	...	...
FRS, OO do	2d	2½d	2d
CHL, A do	2d	3d	...
CPC, G do	4d to 4½d	5d to 5½d	...

Mark	Natural Stem.	Renewed	Root.
Verelapatna	1¾d to 2½d	2½d to 3½d	1¾d to 2½d
Shawlands	2d	...	...
Broad, mixed	3d	...	...
JDHE, B	2½d	...	2d
Diyagama	4d to 5d	7½d to 8d	...
Kahagalla	1¾d to 2d	...	...
Kobambillia	2½d	...	...
JCA	3d	...	...
Papolgashena	1¾d	3d	...
Dunkeld	2½d	...	2½d
St. George	...	4d to 5d	...
Hauteville, hyd.	...	4d	...
Campion	2½d	...	3d
Mousakelle	...	3½d	...
OFFICINALIS.			
Lanka	2¾d	4d	...
Badullawatte	4d	8d	...
Pingarawe	...	7d	...
CHL, A in dia.	2½d to 3d	3½d	...
Yarrow, ledger	...	8d to 8½d	...
Diyagama	2½d	4½d	5½d
Ragalla	2½d	...	5d
Coneygar	2d	...	5½d to 6d

MINCING LANE, August 1st, 1890.

Mark	NaturaRenewed Stem		Root Es—
Dandukalawa	3d	...	...
Dromoland	...	6½d	...
RDE, S in diamond	3½d	5½d	4d
EH, K ,,	2½d	3½d	...
ST & L C, A ,,	2d to 2½d	4d to 4½d	...
Stonycliff	2d	...	...
Meanagalla	2½d	3d	...
Gallamudina	2½d to 3d	3½d	...
B N in diamond	3½d	...	...
ST & LC, S ,,	2d to 2½d	4d	2d to 2½d
Gavatenne	2½d to 3d	4d	...
Mahapahagalla	2½d	3d to 3½d	...
WSBN in diamond	3½d	4½d to 5d	5d to 5½d
Uvakellie	3½d	4½d to 7d	...
OFFICINALIS.			
Hope	3d	4d½	4d½
Dukinfield	3½d to 4d	6½d to 7d	...
Dessford	3½d	...	...
Wigton	4½d	...	4½d

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, July 25th, 1890.

Ex "Navigator"—Yattewatte, 3 bags 72s; 1 74s; 4 75s; 5 71s.

Ex "Oopack"—Sirigalla, 2 bags 71s; 4 72s.

Ex "City of Venice"—Ingurugalle, 21 bags 88s 6d; 4 62s 6d; 1 37s; 6 80s; 3 62s 6d; 1 37s.

Ex "Carthage"—Anniewatte, 13 bags 98s; 3 76s; 2 35s; 1 83s.

Ex "Pallas"—Rajawelle, 20 bags 83s.

Ex "Electrician"—Macoolussa, 2 bags 85s; 1 51s. Wattagalla, 1 bag 80s; 1 75s; 1 51s; 1 54s.

MINCING LANE, August 1st, 1890.

Ex "Navigator"—KK, 5 bags 61s; 3 bags 40s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, July 25th, 1890.

Ex "Oopack"—VB, 6 cases 1s 1d; 1 4½d. St. John Delrey, 5 cases 2s 2d; 3 1s 8d; 4 1s 6d; 1 1s 7d; 1 9d.

Ex "Jumna"—Nellaoolla, 1 case 1s 1d.

Ex "Achilles"—Kandanewera, 1 case 1s.

Ex "Electrician"—Amblamana, 1 case 1s 10d; 1 1s 8d; 3 1s 5d; 2 10½d; 1 1s 4d.

Ex "Navigator"—Maousava, 1 case 1s 7d; 1 1s 2d; 1 9½d; 1 1s 9d; 1 1s 7d; 1 1s 3d; 1 8½d; 1 1s 3d; 1 1s 10d. Midlands, 2 cases 1s 4d; 1 8½d.

Ex "Austral"—Wattagalla, 3 cases 1s 9d.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 19.] COLOMBO, SEPTEMBER 12, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 20th Aug., the undermentioned lots of Tea (61,720 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	L B K	380	4 ch	red leaf	400	23
2	Pasbage	382	3 hf-ch	unassorted	120	30
3	Midlothian	384	10 do	bor pek	500	52 bid
4	Do	386	10 ch	pekoe	1050	38 bid
5	Becherton	388	6 do	bro pek	600	51
6	Do	390	12 do	pekoe	1140	34
7	O G A	392	7 do	bro pek	700	41 bid
8	Do	394	6 do	pekoe	540	34
9	Do	396	3 do	pek sou	270	31
10	Kirrimettia	398	9 hf-ch	bro pek	450	44
11	Do	400	28 do	pekoe	1400	34
12	Do	402	4 do	pek fans	280	27
13	Do	404	2 do	bro mix	96	26
14	Mukeloya	406	18 do	bro pek	1080	55
15	Do	408	8 do	pekoe No. 1	440	45
16	Do	410	10 do	do ,, 2	600	46
17	Do	412	23 do	pek sou	1380	37
18	Do	414	1 do	dust	80	27
19	L G E	416	3 do	or pek	300	37
20	Do	418	2 do	pekoe No. 1	200	34
21	Do	420	1 hf-ch	dust	90	25
22	Theberton	422	19 ch	bro pek	1900	42
23	Do	424	8 do	pekoe	800	32
24	Do	426	7 do	pek sou	700	32
25	Do	428	2 do	pek dust	200	35
26	Do	430	1 do	congou	100	25
27	Chesterford	432	20 hf-ch	bro pek	1100	57
28	Do	434	25 do	pekoe	1250	40
29	Kosgahahena	436	2 ch	bro pek	100	35
30	Do	438	3 do	pekoe	150	31
31	Do	440	2 do	pek sou	100	27
32	Do	442	2 do	sou	100	26
33	D	444	4 do	bro pek	400	43
34	D	446	4 do	pekoe	360	35
35	D	448	9 do	pek sou	720	31
36	D	450	1 do	bro pek sou	90	27
37	Columbia	452	14 box	bro pek	902	61
38	Do	454	20 hf-ch	pekoe	900	69
39	Do	456	3 do	pek sou	135	36
40	Do	458	1 do	dust	75	25
41	I K V	460	2 ch	fans	200	24
42	Do	462	2 do	bro tea	200	19
43	Deemally	464	15 do	unassorted	1500	33 bid
44	Do	466	16 box	or pek	320	55 bid
45	Mousahena	468	3 hf-ch	sou	165	30
46	Do	470	3 do	dust	210	25
47	Do	472	3 do	bro mix	165	26
48	Strathellie	474	11 ch	pekoe	1100	31
49	Do	476	15 do	pek sou	1500	27
50	Do	478	3 do	dust	450	25
51	Do	480	6 do	pek fans	720	24
52	Gona Adika	482	1 hf-ch	red leaf	55 }	25
53	Do	484	1 box	red leaf	20 }	
54	Attabage	486	23 hf-ch	bro pek	1150	55
55	Do	488	35 ch	pekoe	3150	37
56	Do	490	8 do	pek sou	720	31
57	Do	492	5 hf-ch	bro mix	225	26
58	Do	494	4 do	pek fans	280	27
59	Galkadua	496	5 ch	bro pek	500	39
60	Do	498	7 do	pekoe	700	31
61	Do	500	8 do	pek sou	800	30
66	Silverton	510	10 do	or pek	550	44
67	Do	512	18 do	pekoe	900	36
68	Do	514	3 do	sou	150	31
69	Do	516	1 do	dust	80	28
70	S M	518	3 do	bro pek	150	51
71	Do	520	2 do	pekoe	100	38
72	Do	522	5 do	pek sou	250	33
73	Do	524	4 do	bro tea	180	30
74	Do	526	1 box	dust	35	27
75	Bismark	528	3 ch	bro pek	360	50
76	Do	530	3 do	pekoe	350	40
77	Do	532	3 do	pek sou	300	36
78	Leangawella	534	23 boxes	pekoe	2300	46
79	Do	536	24 hf-ch	or pek	1200	60
80	Do	538	9 ch	pek sou	900	37
81	Do	540	1 do	bro mix	100	29
82	Do	542	2 hf-ch	dust	140	23
83	G A	544	2 do	bro pek	110	64
84	Do	546	2 do	pekoe	100	45
85	Do	548	3 do	pek sou	132	39
86	Do	550	1 box	sou	12	33
87	Do	552	1 do	dust	20	27
88	Pate Rajah	554	1 ch	bro pek	100	37
89	Do	556	2 do	pekoe	180	31
90	Do	558	1 do	dust	60	26
91	Handrokande	560	1 hf-ch	bro pek	50	42
92	Do	562	5 do	pekoe	250	33
93	Do	564	1 do	red leaf	36	21
94	Ossington	566	7 do	bro pek	350	33
95	Do	568	5 do	pekoe	250	32
96	Do	570	3 do	pek sou	150	29
97	P	572	4 do	or pek	192	35
98	Horagaskelle	574	2 do	bro pek	132	47
99	Do	576	4 do	pekoe	232	35
100	Do	578	10 do	pek sou	580	33
101	Do	580	2 do	bro mix	120	24
102	Do	582	1 do	congou	56	26
103	Bandarapolla	584	18 do	or pek	900	47
104	Do	586	18 do	bro pek	900	48 bid
105	Do	588	35 do	pekoe	1750	38
106	Do	590	32 do	pek sou	1440	37
107	Do	592	2 do	dust	140	27
108	Killin	594	6 ch	bro pek	600	38
109	Do	596	5 do	pekoe	500	31
110	Do	598	4 do	pek sou	400	31
111	Penrbos	600	23 hf-ch	or pek	1150	50
112	Do	2	67 box	pekoe	1340	41 bid
113	Do	4	25 hf-ch	pek sou	1375	38
114	Do	6	4 do	bro tea	210	32

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today 27th Aug., the undermentioned lots of Tea (18,380 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Agraoya	1	19 hf-ch	bro pek	950	49 bid
2	Do	3	7 ch	pekoe	700	34 bid
3	Do	5	8 do	pekoe No. 2	800	33 bid
4	Do	7	1 hf-ch	dust	80	24
5	Y D	8	35 ch	bro or pek	3325	53 bid
6	Do	10	76 do	pekoe	6840	39 bid
7	F	12	14 do	sou	1120	31
12	L	20	1 do	bro mix	80	21
13	Brae	21	20 hf-ch	bro pek	1100	47 bid
14	A	23	1 do	bro tea	50	24
15	A	24	1 do	red leaf	50	19
16	A	25	1 ch	sou	106	25
17	A D	26	7 do			
			1 box	congou	656	25
18	Do	28	3 ch	sou	289	23 bid
19	Do	30	7 do	bro pek sou	681	24
20	H W D	32	2 hf-ch	unassorted	90	29
21	Do	33	2 do	bro mix	100	22
22	Do	34	2 do	or pek dust	110	24

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room today, 27th Aug., the undermentioned lots of Tea (59,219 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
7	Hangran Oya	63	9 ch	bro pek	990	49
8	Do	65	10 do	pekoe	950	42
9	Do	67	13 do	pek sou	1235	37
10	Do	69	1 do	bro tea	110	25
11	Do	70	2 do	dust	300	25
12	Comar	71	7 do	bro pek	700	45 bid

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
13	Comar	73	8 chests	pekoe	800	36
14	Do	75	6 do	pek sou	600	33
15	Do	77	3 do	bro mix	300	26
16	Do	78	3 hf-ch	dust	180	24
17	F	79	39 ch	pek sou	3510	28
18	F	81	12 do	fans	1140	24
19	Nahakettia	83	7 do	bro pek	700	53
20	Do	85	17 do	pekoe	1650	41
21	Do	87	7 do	sou	610	32
22	Tellisagalla	89	10 do			
			1 hf-ch	bro pek Nos. 1 and 2	1055	41 bid
23	Do	101	6 ch	pekoe	434	36
24	Do	103	8 do	pek sou	576	33
25	Do	105	1 hf-ch	red leaf	46	21
26	Do	106	1 ch	dust	130	27
27	Anchor (in estate mark)	107	14 do	bro pek	1610	52 bid
28	Do	109	39 do	pekoe	3900	38 bid
29	Do	111	19 do	pek sou	1900	35 bid
30	Do	113	19 hf-ch	dust	1425	25 bid
31	Gowravilla	115	24 do	or pek	1200	59
32	Do	117	30 ch	pekoe	3000	44
33	Do	119	9 do	pek sou	900	37
34	Do	121	1 do	bro mix	100	29
35	Do	122	1 hf-ch	dust	50	24
36	D E	123	3 do	dust	249	29
37	Labugama	124	18 do	bro pek	720	55
38	Do	126	18 do	pekoe	720	45
39	Do	128	7 do	pek sou	280	36
40	Do	130	10 box	bro or pek	100	45 bid
41	Do	131	3 hf-ch	pek fans	135	34
42	Do	132	1 do	pek dust	75	32
43	Mahanilu	133	7 ch	pek sou	784	39
44	Do	135	1 hf-ch	dust	80	25
47	Crudeu	140	30 hf-ch	flowery or pek	1500	64
48	Do	142	30 ch	flowery pek	3000	48 bid
49	Do	144	8 do	pek sou	800	36 bid
50	Do	146	5 do	sou	500	32
51	Do	147	2 do	bro mix	200	27
52	Do	148	2 hf-ch	dust	100	27
53	Esperanza	149	2 do	bro or pek	112	50
54	Do	150	13 do	or pek	642	64
55	Do	152	1 do	dust	85	22
56	P G K	153	5 do	sou	180	30
57	Do	154	1 ch	dust	141	22
58	Brownlow	155	20 do	bro pek	2000	63
59	Do	157	17 do	pekoe	1445	49
60	Do	159	13 do	pek sou	1040	39
61	Do	161	1 do	dust	120	25
62	B T	162	30 ch	unassorted	2400	31
63	Albion	164	17 do	bro pek	1615	58
64	Do	166	15 do	pekoe	1275	45
65	Do	168	12 do	pek sou	960	38
66	Do	170	3 do	dust	390	26

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 27th Aug., the undermentioned lots of Tea (27,060 lb.) which sold as under:—

Lot No.	Mark.	Box No.	Pkgs.	Description.	Weight lb.	c.
1	W A V	61	3 ch	unassorted	300	36
32	T N E	62	3 hf-ch	unassorted	168	31
4	Wewesse	63	12 do	bro pek	660	56
5	Do	64	14 do	pekoe	770	45
	Do	65	17 do	pek sou	935	38
6	W	66	3 do	sou	165	32
7	W	67	3 do	pek fans	210	32
8	Crurie	68	6 ch	bro pek	672	55
9	Do	69	11 do	pekoe	1100	45
10	Do	70	6 do	pek sou	564	36
11	R X	71	2 do	pek dust	280	28
12	Do	72	1 do	bro mix	120	26
13	Do	73	1 do	bro tea	120	28
14	Do	74	1 do	dust	110	24
15	C T M	75	3 do	bro mix	170	21
16	Kattookelle	76	3 do	bro pek	345	60
17	Do	77	6 do	pekoe	630	47
18	Do	78	14 do	pek sou	1400	42
19	Roseneath	79	20 hf-ch	bro pek	1200	52
20	Do	80	12 do	pekoe	1200	41
21	Do	81	14 do	pek sou	1260	35
22	W K	82	23 hf-ch	pekoe	1158	34
23	K C	83	11 do			
			3 ch	pekoe	912	32
24	Do	84	6 do	pekoe	586	31
25	Do	85	5 do			
			1 hf-ch	red leaf	563	21
26	Do	86	4 ch			
			1 hf-ch	congou	303	26

Lot No.	Mark	Box No.	Pkg.	Description	Weight lb.	c.
27	C K	87	3 hf-ch			
			1 ch	dust	348	23
28	W W	88	5 do	dust	660	19
29	X X X	89	2 do	sou	186	33
30	Do	90	10 do	bro tea	950	24
31	Do	91	1 do	pek fans	100	27
32	Do	92	3 do	bro mix	285	23
33	Do	93	1 hf-ch	pek dust	75	26
34	Do	94	5 do	dust	350	25
35	Digana-kelle	95	10 do	bro pek	500	61
36	Do	96	4 do	pekoe	200	44
37	Do	97	21 do	pek sou	1050	34
38	Do	98	2 do	dust	160	27
39	Do	99	4 do	fans	240	29
40	Do	100	1 do	bro mix	55	33

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 27th Aug., the undermentioned lots of Tea (68,519 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Descriptien.	Weight lb.	c.
1	Halpantenne	8	3 ch	bro pek	300	47
2	Do	10	3 do	pekoe	300	35
3	Do	12	6 do	pek sou	600	34
4	Do	14	4 do	sou	400	31
5	Do	16	1 do	dust	160	18
6	Do	18	1 do	unas	100	29
7	St. Catherine	20	6 do	bro pek	540	50
8	Do	22	4 do	pekoe	360	40
9	Do	24	3 do	pek sou	270	33
10	Chalmers	26	11 do	bro pek	770	59
11	Do	28	35 do	pekoe	2100	46
12	Do	30	10 do	pek sou	600	35
13	Do	32	2 do	pek fans	180	30
14	Do	34	1 do	bro mix	75	37
15	Radella	36	16 do	bro pek	1600	54
16	Do	38	17 do	pekoe	1360	39
17	Do	40	13 do	pek sou	1040	36
18	Middleton	42	25 hf-ch	bro pek	1400	61
19	Do	44	9 do	pekoe	900	46
20	H E P	46	8 hf-ch	bro pek	480	48
21	Do	48	4 do	pekoe No. 1	220	40
22	Do	50	4 do	do ,, 2	240	37
23	Do	52	15 do	pek sou	900	34
30	St. Heliers	66	14 ch	bro pek	1400	46
31	Do	68	13 do	pekoe	1300	35 bid
32	Do	70	15 do	pek sou	1500	33
33	Amblakande	72	8 do	or pek	880	46 bid
34	Do	74	19 do	pekoe	1710	36 bid
35	Do	76	3 do	pek sou	270	31 bid
36	Do	78	1 do	bro mix	100	23
37	Do	80	3 do	or pek	330	46
38	Do	82	8 do	pekoe	720	35 bid
40	Peru	86	3 do	bro pek	300	48
41	Do	88	8 do	pekoe	800	37
42	Do	90	1 do	sou	100	28
43	K	92	7 do	pek fans	1030	26
44	Malvern	94	4 hf-ch	or pek	240	61
45	Do	96	4 ch	pekoe	400	46
46	Do	98	2 do	pek sou	200	37
47	Do	100	1 hf-ch	dust	70	24
48	Deaculla	102	11 do	or pek	660	62
49	Do	104	12 ch	pekoe	1200	51
50	Do	106	5 do	pek sou	500	37
51	Do	108	1 do	bro mix	100	28
52	Do	110	1 hf-ch	dust	70	24
53	Drayton	112	30 do	or pek	1500	56
54	Do	114	10 do	pek sou	500	37
57	A P	120	3 ch			
			1 hf-ch	pekoe	360	ou
58	Do	122	4 do	pek sou	190	27
59	Do	124	7 ch			
			1 hf-ch	bro tea	430	21
	(The Talgaswella Tea Co., Limited.)					
60	Talgas-wela	126	20 ch	bro pek	2000	45
61	Do	128	11 do	pek sou	1104	34
62	Pattiagama	130	8 do	bro pek	800	58
63	Do	132	36 do	pekoe	3420	44
64	Do	134	2 do	pek sou	190	30
65	Do	136	1 do	dust	150	26
66	Farnham	138	20 hf-ch	or pek	1000	58
67	Do	140	20 do	pekoe	900	46
68	Do	142	22 do	pek sou	990	40
69	Do	144	31 do	sou	1395	34
70	Do	146	3 do	fans	180	32
71	C	148	2 do	bro pek	83	40
72	C	150	1 do	do	45	34
73	C	152	1 box	do	20	38

Lot No.	Mark	Box No.	Pkgs.	Descriptiou	Weight lb.	c.
76	Pantiya	158	12 ch	bro pek	1105	47 bid
77	Do	160	13 do	or pek	1053	42
78	Do	162	15 do	pekoe	1065	38
79	Do	164	13 do	pek sou	962	34
80		166	2 hf-ch	sou	66	29
81		168	1 do	sou	34	28
82		170	1 do	dust	80	25
83	Iddegodde	172	18 do	bro pek	792	47
84	Do	174	10 do	pekoe	450	35
85	Do	176	9 do	pek sou	360	33
86	Do	178	1 ch	sou	71	28
87	Do	180	1 box	dust	29	25
	(The Yatiyantota Tea Co., Limited.)					
88	Polatagama	182	34 hf-ch	bro pek	1700	60
89	Do	184	58 do	pekoe	2900	46
90	Do	186	63 do	pek sou	3150	39
91	Abamalla	188	12 do	bro mix	900	31
92	Do	190	5 do	dust	350	24
93R		192	5 ch	bro mix	450	19
94R		194	5 do	dust	700	24
95R		196	1 do	sou	90	23

Messrs. E. Benham & Co. put up for sale at the Chamber of Commerce Sale-room today, 3rd Sept., the undermentioned lots of Tea (4,570 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Wangioya	24	19 hf-ch	bro or pek	1140	58
2	Do	25	13 ch	or pek	1430	50
3	Do	26	11 do	pekoe	1100	45
4	Do	27	9 do	pek sou	900	36

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 3rd Sept., the undermentioned lots of Tea (12,425 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight lb.	c.
5	D E C	41	2 hf-ch	red leaf	100	25
6	Woodend	42	6 ch	bro pek	660	43 bid
7	Do	44	13 do	pekoe	1235	36
8	Do	46	7 do	pek sou	665	33
9	Do	48	1 do	bro tea	115	27
10	Do	49	1 do	dust	135	24
11	Nabalma	50	38 hf-ch	bro or pek	2090	53
12	Do	52	24 ch	pekoe	2400	41
13	Do	54	19 hf-ch	pek sou	1045	34
14	Do	56	3 do	dust	240	26
15	Brae	57	41 do	pekoe	2050	35 bid
16	Do	59	2 ch	bro pek fans	140	33

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 3rd Sept., the undermentioned lots of Tea (45,632 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Alnoor	171	2 hf-ch	congou	80	30
2	Do	172	2 do	fans	100	32
3	Do	173	7 do	pek sou	280	34
4	Do	175	8 do	pekoe	320	42
5	Do	177	5 do	bro pek	200	54
6	Do	179	11 do	or pek	440	44
7	F	181	21 ch	bro pek	2205	41
8	F	183	13 do	pekoe	1235	35
9	F	185	17 do	pek sou	1530	30
10	Dunbar	187	14 do	bro pek	1400	58
11	Do	189	11 do	pekoe	990	46
12	Mocha	191	24 hf-ch	bro pek	1320	68
13	Do	193	15 ch	pekoe	1500	52
14	Do	195	12 do	pek sou	1140	42
15	Do	197	12 do	sou	1080	36
16	Abbotsford	199	15 do	bro pek	1425	63 bid
17	Killaloo	201	53 ch	sou	4240	30
18	Do	203	29 do	unas	2320	23
19	Bittacy	205	14 hf-ch	bro pek	840	60
20	Do	207	26 do	pekoe	1560	45
21	V P	209	8 do	bro pek	464	48
22	Do	211	7 ch	pekoe	658	41
23	Do	213	7 do	pek sou	644	36
24	Bowhill	215	15 do	bro pek	1500	41 bid
29	B B	221	7 ch	bro pek	770	49
30	Do	223	5 do	pekoe	446	37
31	Do	225	13 do	pek sou	1234	34
32	Do	227	1 do	sou	300	31
33	Do	228	1 do			
			1 hf-ch	dust	205	24
34	B	229	1 hf-ch	dust	82	24
35	B	230	4 do	congou	240	30
36	B	231	1 do	red leaf	56	25
37	B E R	232	6 ch	bro pek	540	37
38	Do	234	9 do	pek sou	810	27
39	Pate Rajah	236	2 do	pekoe	160	36
40	Do	237	1 do	bro pek	90	44
41	Do	238	1 do	mixed	90	32
42	O	239	2 hf-ch	dust	150	26
43	Alnoor	240	7 do	pekoe	280	38
44	Do	241	4 do	bro pek	160	47
45	Do	242	1 do	cougou	40	33
46	Do	243	1 do	fans	50	36
47	Do	244	2 do	bro or pek	80	53
48	Glencorse	245	20 ch	pekoe	1800	42
49	Do	247	12 do	bro pek	1320	57
50	Do	249	12 do	pek sou	1020	36
51	Madool-tenne	251	9 do	bro pek	990	47
52	Do	253	9 do	pekoe	900	37
53	Do	255	7 do	pek sou	665	32
54	Ballagalla	257	18 hf-ch	bro pek	1080	54
55	Do	259	12 h	pekoe	1080	46
56	Do	261	18 do	pek sou	1650	38

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 3rd Sept., the undermentioned lots of Tea (22,823 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	A S C		2 hf-ch	fans	100	33
2	Do	2	4 do	red leaf	200	25
3	Do	3	1 do	dust	33	26
4	Malgolla	4	25 do	bro pek	1375	53
5	Do	5	11 do	pekoe	550	41
6	Do	6	59 do	pek sou	2950	36
7	Do	7	9 do	bro tea	495	35
8	Salawe	8	6 do	bro pek	336	59
9	Do	9	8 do	pekoe	416	41
10	Do	10	18 do	pek sou	900	37
11	Do	11	11 do	sou	550	34
12	Do	12	10 do	unas	500	35
13	Do	13	2 do	dust	150	26
14	Depedene	14	8 do	bro pek	400	54 bid
15	Do	15	11 do	pekoe	550	40
16	Do	16	17 do	pek sou	850	35
17	H D	17	14 do	bro tea	700	33
18	Do	18	3 do	bro mix	150	25
19	Do	19	2 do	dust	160	27
20	Hattan-wella	20	11 do	bro or pek	550	53
21	Do	21	28 do	pekoe	1400	39
22	Do	22	3 do	pek sou	150	30
23	Do	23	1 do	bro mix	50	24
24	Do	24	2 do	dust	110	24
25	Allakolla	25	13 do	bro pek	845	54
26	Do	26	17 ch	pekoe	1705	40
27	Do	27	10 hf-ch	pek sou	550	34
28	Do	28	2 do	bro tea	110	30
29	Do	29	1 do	dust	90	24
30	C A	30	5 do	unas	280	41
31	Do	31	3 do	bro mix	168	34
32	Do	32	2 do	dust	120	26
33	B V A	33	6 ch	pek sou	660	32
34	D	34	4 do	red leaf	320	24
35	D	35	7 do	dust	840	27
36	D G A	36	1 hf-ch	pek fans	60	36
37	Do	37	7 do	fan	420	33
38	Do	38	3 do	bro mix	165	31
39	Do	39	2 do	dust	150	24
40	W K	40	3 do	bro pek	156	39
41	Do	41	6 ch	pekoe	575	35
42	Do	42	1 do	pek sou	80	29
43	Do	43	4 do	bro tea	452	24
44	Do	44	2 do	fans	250	36
45	Do	45	2 hf-ch	pek dust	140	25
46	H G A	46	2 ch	bro mix	232	30
47	Do	47	2 hf-ch	dust	160	25
48	Do	48	6 ch	sou	510	30
49	P	49	3 hf-ch	or pek	150	56

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 3rd Sept., the undermentioned lots of Tea (41,161 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Goomera	198	1 ch	dust	140	24
2	Do	200	1 do	red leaf	100	25

Lot No	Mark	Box No.	Pkgs.	Description	Weight. lb.	c.
3	Alton	202	14 hf-ch	bro tea	630	31
4	Do	204	7 do	bro tea No. 2	315	22
5	Navaheena	206	35 do	bro pek	1750	55
6	Do	208	20 do	pekoe	900	44
7	Do	210	50 do	pek sou	2250	39
8	N A	212	2 do	pek dust	140	29
9	Do	214	1 do	dust	68	26
10	Do	216	1 do	congou	72	29
11	Doonevale	218	3 do			
			5 hf-ch	bro pek	550	48
12	Do	220	15 ch	pek sou	1350	35
13	Do	222	1 hf-ch	bro tea	53	29
14	Hope	224	1 ch	bro mix	126	20
15	Kirrimettia	226	2 do	red leaf	208	30
16	S S S	228	1 do	pek sou	105	30
17	Do	230	1 do	red leaf	170	18
18	Warwick	232	1 hf-ch	dust	82	26
19	V O	234	2 ch	bro tea	220	24
20	Do	236	3 do	dust	336	24
21	Bramley	238	2 hf-ch	dust	200	26
22	B Y	240	2 do	bro pek	130	50
23	Do	242	1 do	pekoe	55	40
24	Do	244	1 do	pek sou	50	36
25	H	246	7 do	bro pek	350	37
26	H	248	1 do	pek fans	50	35
27	Ramboddc	250	11 do	bro pek	605	59
28	Do	252	14 do	pekoe	700	43
29	Do	254	3 do	sou	150	35
30	Do	256	1 do	dust	65	26
31	C R D	258	2 do	dust	136	25
32	Do	260	3 do	red leaf	165	24
33	D G	262	7 ch	bro pek	700	49
34	Do	264	1 do	bro pek	80	42
35	Do	266	5 do	pekoe	450	40
36	Do	268	5 do	pek sou	450	34
37	Do	270	1 do	pek sou	80	34
38	Do	272	1 do	pek dust	80	26
39	K V	274	2 do	congou	180	31
40	Do	276	1 do	fans	100	32
41	Thornfield	278	20 hf-ch	bro pek	1200	65
42	Do	280	20 ch	pekoe	2000	46
43	Do	282	1 hf-ch	pek dust	80	27
44	Galkaduwa	284	15 do	bro pek	750	49
45	Do	286	18 do	pekoe	900	36
46	Do	288	26 do	pek sou	1300	34
47	Monrovia	290	6 do	bro pek	300	48
48	Do	292	4 ch			
			1 hf-ch	pekoe	450	38
49	Do	294	7 ch			
			3 hf-ch	pek sou	850	34
50	Do	296	1 do	unas	50	31
51	Do	298	4 ch			
			3 hf-ch	sou	530	31
52	Do	300	1 ch			
			2 hf-ch	congou	200	28
53	Do	302	2 do	dust	125	24
54	Do	304	1 ch	red leaf	85	25
55	E K	306	1 do			
			2 hf-ch	unas	200	21
56	R	308	7 ch	pek fans	560	31
57	Theydon	310	10 do	bro or pek	1000	58
58	Do	312	14 do	pekoe	1260	44
59	Do	314	12 do	pek sou	1020	36
60	Do	316	4 do	sou	340	30
61	Clunes	318	21 hf-ch	bro pek	1050	49
62	Do	320	43 do	pekoe	1935	39
63	W M	322	4 do	bro or pek	420	47
64	Bandara-polla	324	20 do	bro pek	1000	51
65	Do	326	42 do	pekoe	2100	39 bid
66	Do	328	20 do	pek sou	900	34 bid
67	Do	330	3 do	dust	210	26
68	Avisawella	332	3 ch	dust	450	26
69	H S	334	7 do	dust	980	26
70	D G	336	33 hf-ch	pek sou	1650	42
71	Queensland	338	3 ch	pek fans	225	32
72	Bonaccord	340	5 hf-ch	fans	250	39
73	Do	342	1 do	fans	35	38
74	Do	344	5 do	dust	375	25
75	Clova	346	8 do	bro pek	440	42
76	Do	348	14 do	pekoe	700	34
78	Do	350	18 do	pek sou	900	32

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 15th August:—

Ex "Golconda"—Gowerakellie, 1b 108s; 4c 1b 102s 6d, 5c 104s 6d; 2c 1t 104s 6d; 1c 1b 95s; 1c 128s.

Ex "India"—Niabedda, 1c 109s; 3c 107s 6d; 6c 105s 1c 101s; 1c 126s. (NBT), 2t 109s.

Ex "Oroya"—Gowerakellie, 4c 107s 6d; 8c 104s 6d; 2t 127s 6d.

Ex "India"—Verelapatna, 2c 106s 6d; 3c 1b 104s 6d: 1b 97s 6d; 1t 127s; 1c 96s; 2 bags 100s 6d.

Ex "Clan Mackenzie"—Craig, 1c 109s; 5c 105s; 4c 1b 105s; 2c 1b 102s; 1c 126s; 1c 1b 100s. (DC), 1b 100s 6d; 3c 105s; 2c 102s; 1t 98s 6d; 1c 126s; 1c 95s 6d; 1b 98s; 2 bags 91s 6d.

Ex "Capella"—Uvakellie, 1c 106s; 1c 1t 103s 6d; 3c 102s 6d; 1b 96s 6d; 1t 121s; 1b 94s 6d; 1 bag 101s.

Ex "Golconda"—Maha Uva, 2c 108s; 3c 1t 107s; 5c 103 6d; 1b 98s 6d; 1c 127s; 1t 94s: 4 bags 103s 6 l.

Ex "India"—Mausagalla, 2c 108s 6d; 4c 105s 6d; 1c 1t 99s 6d; 1c 128s; 1t 105s 6d; 1 bag 103s.

Ex "Chusan"—OKO, 2c 102s.

Ex "Oroya"—Tillicoultry, 1t 102s; 1c 100s; 1b 99s; 1b 119s; 1b 96s; 1b 94s; 1 bag 91s. St. Leonards, 1t 103s; 7c 1t 101s 6d; 6c 101s; 1c 119s; 1c 97s 6d; 2 bags 101s.

Ex "Chusan"—Waldemar, 1b 106s; 3c 1t 104s; 1t 125s; 1 bag 102s.

Ex "Gulf of Martaban"—Delmar (OBEC), 1c 104s; 6c 102s 6d; 2c 1b 99s 6d; 1b 1t 105s.

Ex "Chingwo"—Arnhall, 1b 1c 102s; 1c 98s; 1b 113s; 1c 96s; 1 bag 101s. Ampittiakande, 1b 105s; 2c 102s; 5c 95s; 1b 102s; 1c 96s 6d; 1 bag 102s; 1 bag 101s; 1 bag 91s.

Ex "Capella"—Moonarakanda, 1c 104s; 1c 1t 103s 6d; 3c 102s; 1c 99s; 1t 123s. Dambatenne, 2c 1t 106s 6d; 4c 1b 104s; 5c 103s; 2c 1b 103s; 1c 1t 119s 6d.

Ex "India"—Leangawelle, 2c 1b 10?s 6d; 9c 1t 106s 6d; 2c 101s; 1c 129s. Haputale, 3c 110s; 12c 1b 107s 6d 2c 1t 101s 6d; 1c 1b 130.

Ex "Chingwo"—Roehampton, 1b 103s; 3c 107s; 5c 104s 6d; 2c 1b 105s; 1t 98s; 1c 1b 104s.

Ex "Oroya"—RWA, 2c 106s; 2c 1b 105s; 1b 99s; 2b 118s 6d; 1b 97s. Goodwood, 1b 1c 108s 6d: 3c 105s; 1b 98s; 2b 188s 6d; 1b 95s; 1 bag 94. Ouvah NG, 1t 2c 106s; 4c 104s; 1b 97s; 2b 118s 6d. 1t 96s; 2 bags 103s; 1 91s 6d. Ouvah GA, 1c 105s; 3c 1t 103s 6d; 1t 97s 6d; 2b 115s; 1t 95s 6d; 2 bags 92s 6d; 1 91s 6d.

Ex "Astronomer"—Veralapatna, 1b 107s; 2c 1b 107s 6d; 3c 1b 104s; 1t 99s; 1c 128s 6d; 1c 97s; 1 bag 104s.

Ex "City of Oxford"—North Matale, 1t 97s; 1b 100s; 1b 92s.

Ex "City of Bombay"—Ouvah GA, 1c 1t 107s 6d; 5c 105s; 3c 1b 105s; 1c 1t 100s 6d; 1b 126s; 1c 124s; 1c 97s 6d; 3 bags 105s; 1 92s 6d.

Ex "India"—Ouvah JB, 2c 1b 108s; 5c 105s; 4c 1b 104s 6d; 1c 1t 101s; 1b 124s; 1c 121s; 1c 1b 98s 6d; 4 bags 105s.

Ex "Clan Mackenzie"—Rajawelle, 9 bags 95s 6d; 1 bag 88s; 1 75s.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett & Co.'s Circular.)

MINCING LANE, August 15th, 1890.

Mark	Natural Stem	Renewed	Root
D C in diamond	$2\frac{1}{2}$d to $4\frac{1}{2}$d	$4\frac{1}{2}$d	...
Poonagalla	$2\frac{1}{2}$d	...	3d
Agrakande	...	3d	...
Hanipha	3d	4d	...
Blackwood	$3\frac{1}{2}$d	$6\frac{1}{2}$d	...
Forest Hill	4d	...	...
Eton	2d to $2\frac{1}{2}$d	$4\frac{1}{2}$d	4d
Thornfield	...	4d to $4\frac{1}{2}$d	...
S in diamond	2d to $2\frac{1}{2}$d	$3\frac{1}{2}$d	4d to $4\frac{1}{2}$d
Ellawatte	2d to $2\frac{1}{2}$d	$4\frac{1}{2}$d	$2\frac{1}{2}$d
Stella	$3\frac{1}{2}$d	...	...
Mahakand	$3\frac{1}{2}$d	$5\frac{1}{2}$d	...
Kahagall	$2\frac{1}{2}$d	...	...
OFFICINALIS.			
Forest Hill	3d	7d	...
Merisketiya, hybrid	$3\frac{1}{2}$d to 4d	...	$6\frac{1}{2}$d
Glasgow, do	3d	$4\frac{1}{2}$d	...

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, August 15th, 1890.

Ex "Peshawur"—Victoria, 15 bags 91s; 1 40s. Elmshurst, 1 bag 67s.

Ex "Austral"—Udapolla, 15 bags 87s.

Ex "Clan Mackenzie"—(OW&C), 1 bag 3s.

"CEYLON OBSERVER" PRESS, COLOMBO.

TEA, COFFEE, CINCHONA, COCOA, AND CARDAMOM SALES.

No. 20.] COLOMBO, SEPTEMBER 27, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. BENHAM put up for sale at the Chamber of Commerce Sale-room today, 10th Sept., the undermentioned lots of Tea (11,000 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Wangieoya	28	15 hf-ch	bro or pek	900	63
2	Do	29	17 ch	or pek	1870	52
3	Do	30	19 do	pekoe	1900	45
4	Do	31	14 do	pek sou	1400	38
5	Halloowella	32	13 do			
			1 hf-ch	or pek	1090	67
6	Do	33	28 ch	pekoe	2240	48
7	Do	34	20 do	pek sou	1600	39

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 10th Sept., the undermentioned lots of Tea (54,537 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	L	263	6 hf-ch	sou	240	37
2	L	265	2 do	pek fans	90	34
3	L	266	2 do	bro mix	80	32
4	L	267	2 do	unas	80	26
5	L	268	1 do	pek dust	70	31
6	L	269	2 do	red leaf	80	26
7	G K W	270	1 ch	bro tea	90	35
8	Do	271	1 do	dust	80	22
9	Do	272	1 do	red leaf	100	19
10	Anchor (in estate mark)	273	23 hf-ch	bro pek	1265	55
11	Do	275	39 ch	pekoe	3900	46
12	Do	277	37 do	pekoe	3700	46
13	Do	279	19 do	pek sou	1900	38
14	Do	281	20 do	pek sou	2000	38
15	Do	283	13 do	bromix	1625	33
16	Do	285	19 hf-ch	dust	1425	26
17	Eilandhu	286	12 ch	bro pek	900	53
18	Do	288	22 do	pekoe	1650	42
19	Do	290	10 do	pek sou	750	37
20	Do	11	2 hf-ch	dust	150	24
21	Galkandewatte	12	15 ch	bro pek	1500	64
22	Do	14	19 do	pekoe	1700	47
23	Great Valley	16	23 hf-ch	bro pek	1700	61
24	Do	18	14 ch	pekoe	1330	44
25	Do	20	22 do	pek sou	1980	37
26	Logan	22	18 hf-ch	bro pek	900	54
27	Do	24	23 do	pekoe	1035	44
28	Do	26	33 do	pek sou	1485	40
29	Do	28	12 do	sou	540	36
30	Do	30	5 do	dust	300	26
31	Do	31	2 do	red leaf	90	26
32	Alliady	32	5 ch	bro pek	650	45
33	Do	34	3 do	pekoe	330	35
34	Do	36	7 do	pek sou	700	34
35	Do	38	7 do	sou	770	33
36	Do	40	11 do	sou	1210	
42	W K	55	2 hf-ch	red leaf	80	23
43	H J R	56	8 ch	bro pek	760	52
44	Do	58	10 do	pekoe	800	48
46	Do	62	1 hf-ch	dust	80	24
47	Maddegedera	44	24 do	bro pek	1200	50
48	Do	46	15 do	pekoe	675	40
49	Do	48	1 do	sou	30	34
50	Do	49	1 do	dust	74	25
54	Gonavy	69	15 do	bro pek	1500	75
55	Do	71	4 do	pekoe	360	50
56	Do	73	3 do	pek sou	270	43
57	Do	74	1 hf-ch	dust	75	32
58	Kadienlena	75	18 ch	bro pek	1620	56
59	Do	77	18 do	pekoe	1440	43
60	Do	79	12 do	pek sou	960	37
61	Do	81	1 do	dust	125	26

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 10th Sept., the undermentioned lots of Tea (24,530 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Glanrhos	14	4 ch	bro pek	380	48
2	Do	16	10 do	pek sou	900	37
3	Do	18	1 do	fans	110	26
4	Do	19	2 do	congou	160	32
5	Nahalma	20	19 hf-ch	bro pek	1140	52
6	Do	22	19 ch	pekoe	2090	40
7	Relugas	24	24 hf-ch	bro pek	1320	55
8	Do	26	2 ch	pekoe	210	44
9	Do	27	23 do	pek sou	2300	36
10	Torrington	29	13 hf-ch	bro or pek	780	66
11	Do	31	10 ch	bro pek	1100	51
12	Do	33	19 do	pekoe	1900	45
13	Do	35	17 do	pek sou	1530	39
14	Do	37	3 hf-ch	dust	210	26
15	Yahaella	38	13 do	bro pek	650	51 bid
16	Do	40	15 do	pekoe	675	41
17	Do	42	1 do	fans	60	30
18	Do	43	1 do	dust	70	24
19	Pambagama	44	23 do	bro pek	1380	48
20	Do	46	40 ch	pekoe	4000	38
21	Do	48	15 do	pek sou	1425	33 bid

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 10th Sept., the undermentioned lots of Tea (28,979 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Burnside	50	12 hf-ch	bro pek	720	49 bid
2	Do	51	19 do	pekoe	950	41
3	Do	52	2 do	pek sou	100	35
4	Wewesse	53	11 do	bro pek	605	56
5	Do	54	12 do	pekoe	660	44
6	Do	55	13 do	pek sou	715	39
7	Do	56	3 do	sou	165	35
8	Do	57	2 do	pek fans	140	33
9	Do	58	1 do	dust	90	23
11	M K	60	5 do	bro pek	500	50
12	Do	61	5 do	pekoe	425	35 bid
13	Do	62	3 do	pek sou	255	32
14	Aadneven	63	5 do	bro pek	500	61
15	Do	64	6 do	pekoe	540	39 bid
16	K M O K	65	1 do	bro tea	90	36
17	Do	66	1 do	dust	80	20
18	St. Andrew's	67	9 hf ch	or pek	594	63 bid
19	Do	68	45 box	or pek	900	54 bid
20	Do	69	8 hf-ch	bro pek	512	47
21	Do	70	28 do	pekoe	1792	43 bid
27	Depedene	76	8 do	bro pek	400	58
31	E	80	1 do	sou	100	36
32	E	81	2 do	dust	300	26
33	E	82	2 do	unas	200	35 bid
34	K K	83	2 do			
			1 hf-ch	pekoe	250	27
35	Do	84	1 ch			
			1 hf-ch	red leaf	150	21
36	Do	85	2 do	dust	120	23
37	Chertsey	86	3 do	bro pek	150	54
38	Do	87	3 do	pekoe	135	40 bid
39	Do	88	4 do	pek sou	180	37
40	Do	89	6 do	congou	240	33
41	Do	90	11 do	bro mix	550	29
42	Do	91	3 do	dust	195	26
43	Forest Hill	92	13 ch	bro pek	1300	53
44	Do	93	13 do	pekoe	1170	41
45	Do	94	4 do	pek sou	360	35
46	S B R	95	16 do	or pek	1440	43 bid
47	Do	96	16 do	pekoe	1280	36
48	Do	97	29 do	pek sou	2900	33
49	Do	98	2 do	dust	280	25
50	Stockholm	99	13 do	bro pek	1300	60
51	Do	100	22 do	pek sou	1980	42 bid
52	Do	1	1 do	fans	140	30 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 10th Sept., the undermentioned lots of Tea (67,436 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	E D K E	352	6 hf-ch	red leaf	300	30
2	L H	354	4 ch	bro pek sou	480	24
3	Becherton	356	6 do	bro pek	600	51
4	Do	358	13 do	pekoe	1235	39
5	Do	360	2 do	sou	200	34
6	Caledonia	362	7 do	or pek	700	49
7	Do	364	7 ch	pek sou	700	39
8	Do	366	1 hf-ch	bro tea	55	29
9	Harangalla	368	24 do	bro pek	1200	49 bid
10	Do	370	13 ch	pekoe	1235	38 bid
11	Do	372	6 do	pek sou	540	35
12	Glenorchy	374	17 hf-ch	bro pek	850	70
13	Do	376	21 do	pekoe	1155	54
14	Do	378	9 do	pekoe	450	50
15	G M B	380	5 do	bro pek	300	58
16	Do	382	12 do	pekoe	720	44
17	Do	384	2 do	bro mix	120	31
18	Do	386	1 ch	dust	100	25
19	Do	338	3 hf-ch	congou	180	37
20	St. Leonard's	390	1 do	congou	50	32
21	Do	392	1 do	dust	60	25
22	Pansalatenna	394	13 ch	bro pek	1365	59
23	Do	396	13 do	pekoe	1300	46
24	Do	398	11 do	pek sou	1045	40
25	Yataderia	400	18 do	bro or pek	1800	45
26	Do	402	32 do	pekoe	2912	37
27	Do	404	12 do	pek sou	1008	33
28	Do	406	3 do	pek fan	300	27
29	Andangodde	408	6 do	dust	780	25
30	Portmore	410	40 do	bro pek	4400	61
31	Do	412	21 do	pekoe	2100	41
32	Meddetenne	414	5 hf-ch	bro pek	250	53
33	Do	416	12 do	pekoe	600	43
34	Do	418	5 ch	pek sou	500	37
35	Do	420	1 do	dust	145	24
36	R	422	5 do	dust	700	22
37	R	424	2 do	red leaf	180	22
38	Duckwari	426	4 do	unas	400	25
39	Do	428	2 do	dust	260	25
40	Do	430	3 do	fans	315	28
41	Do	432	3 do	red leaf	294	31
42	Aigburth	438	14 do	pek sou	1400	36 bid
43	F F	440	2 do	bro mix	200	23
44	Do	442	2 do	dust	261	25
45	K	450	4 hf-ch	bro pek	200	41
46	I G	452	10 ch	bro tea	900	33
47	Marlborough	454	3 do	bro pek	300	58
48	Do	456	7 do	pekoe	700	44
49	Do	458	2 do	pek sou	200	37
50	Mayfair	460	4 do	bro pek	400	58
51	Do	462	11 do	pekoe	1100	45
52	Do	464	2 do	pek sou	200	38
53	Do	466	1 do	dust	120	24
54	Do	468	1 do	bro mix	100	32
55	Strathellie	470	13 do	pek sou	1300	30
56	D W	472	1 do	pekoe	109	32
57	Craighead	474	38 hf-ch	bro or pek	1900	59
58	Do	476	25 ch	pekoe	2250	44
59	Do	478	29 do	pek sou	2465	33
60	Do	480	7 do	sou	595	34
61	Palmerston	482	5 hf-ch	bro pek	275	68
62	Do	484	6 ch	pekoe	600	47
63	Do	486	4 do	pek sou	400	40
64	H	488	9 hf-ch	pek dust	633	23
65	P B	490	15 do	or pek	744	50 bid
66	Amblakande	492	5 ch	bro or pek	550	48
67	Do	494	8 do	pekoe	720	40
68	Do	496	2 do	pek sou	180	34
69	Do	498	1 do	bro mix	110	18
70	W F	500	19 box	bro pek	95	43
71	Midlothian	502	19 hf-ch	bro pek	500	54 bid
72	Do	504	6 ch	pekoe	660	41 bid
73	Do	506	1 hf-ch	congou	45	32
74	Do	508	1 do	red leaf	55	23
75	Do	510	1 do	dust	80	25
76	H	512	2 do	dust	160	24
77	H	514	1 do	bro tea	80	25
78	Hatooloya	516	5 ch	red leaf	450	21
79	Dehiowitta	518	15 do	bro pek	1575	48
80	Do	520	43 do	pekoe	4085	41
81	Do	522	12 do	pek sou	1140	35
82	Do	524	2 do	dust	260	24
83	Do	526	1 do	red leaf	95	23
84	Atherfield	528	1 hf-ch	dust	80	25
85	Do	530	4 do	bro tea	200	33
86	Do	532	1 do	bro mix	50	35

Lot No	Mark	Box No.	Pkgs.	Description	Weight. lb.	c.
	(The Ceylon Tea Plantation Co., Limited.)					
87	Mariawatte	534	20 ch	or pek	1900	58
88	Do	536	31 do	pekoe	2790	45
89	Do	538	26 do	pek sou	2340	38
90	P T L M	540	2 hf-ch	bro pek	80	46
91	Do	542	2 do	pekoe	80	37
92	Do	544	3 do	pek sou	120	35
93	Do	546	1 do	congou	40	33
94	X (in estate mark)	548	2 do	pekoe	90	30

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today 17th Sept., the undermentioned lots of Tea (27,657 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Brae	50	10 hf-ch	bro pek	550	56 bid
2	Do	52	7 do	pekoe	350	45
3	Do	54	12 do	pek sou	600	37 bid
4	Do	56	2 do	sou	100	32
5	Do	57	2 do	congou	90	27
6	Harrow	60	8 do	bro pek	480	55
7	Do	62	9 do	pekoe	478	44
8	Do	64	3 do	pek sou	159	40
9	Do	65	1 do	bro tea	77	27
10	A K A C	66	10 do	bro pek	500	64
11	Do	68	42 do	pekoe	2100	48
12	Do	70	9 do	sou	450	42
13	Do	72	1 do	dust	70	26
14	Do	73	1 do	fans	60	29
15	Horagoda	74	8 do	bro pek	400	54
16	Do	76	8 do	pekoe No. 1	360	42
17	Do	78	6 do	pekoe No. 2	270	39
18	Do	80	7 do	pek sou	315	36
19	Do	82	2 do	dust	108	26
20	H	83	1 do	red leaf	55	23
21	X Y Z	84	25 ch	bro mix	2750	39
22	P P	86	5 do	dust	650	23 bid
23	Pambagama	87	13 hf-ch	bro pek	780	47
24	Do	89	25 ch	pekoe	2500	38
25	Do	91	10 do	pek sou	950	33
26	Do	93	2 hf-ch	dust	140	25
27	Nahalma	94	18 do	bro pek	990	55 bid
28	Do	96	19 ch	pekoe	1900	43
29	A G C	98	7 hf-ch	dust	490	25
36	A	10	27 ch	pekoe	2700	46

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 17th Sept., the undermentioned lots of Tea (55,131 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Ella	82	2 ch	pek dust	250	28
2	Do	83	20 do	pek sou	1600	37
3	Do	85	25 do	pekoe	2000	41
4	Do	87	14 do	bro pek	1400	47
5	Deeside	89	33 hf-ch	bro pek	1815	70
6	Do	101	29 ch	pekoe	2900	51
7	Do	103	2 do	congou	200	38
8	Do	104	1 do	dust	160	23
9	Duneside	105	13 do	bro pek	1567	38 bid
10	Do	107	13 ch	or pek	1053	43 bid
11	Do	109	10 hf-ch	pekoe	450	37 bid
12	Do	111	38 ch	pek sou	3785	28 bid
13	Do	113	13 do	bro pek sou	1275	45
14	Kanaugama	115	12 do	bro pek	1260	45
15	Do	117	12 do	pekoe	1140	42
16	Do	119	19 do	pek sou	1710	36
17	F	121	12 do	fans	1140	28
18	H J R	123	11 do	pek sou	935	38
19	Little Valley	125	7 hf-ch 5 ch	bro pek	860	53
20	Do	127	17 hf-ch 13 ch	pekoe	2000	47
21	Maria	129	13 do	bro pek	1430	58
22	Killaloo	131	12 do	sou	960	30
23	Ferndale	133	8 do	bro pek	800	67
24	Do	135	16 do	pekoe	1600	53
25	Abbotsford	137	19 do	bro pek	1805	70
26	Do	139	29 do	pekoe	2320	53
27	Do	141	19 do	pek sou	1520	44
28	Tientsin	143	11 hf-ch	bro pek	660	70
29	Do	145	16 ch	pekoe	1360	52
30	Agra ouvah	147	53 hf-ch	bro pek	2963	55 bid
31	Do	149	26 do	pekoe	1300	47
32	Do	151	3 do	bro pek fans	258	23

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
33	Alnoor	152	2 hf-ch	bro or pek	80	51
34	Do	153	4 do	bro pek	160	47
35	Do	154	5 do	pekoe	200	42
36	Do	155	1 do	unas	31	39
37	Do	156	1 do	fans	50	28
38	Do	157	1 do	congou	40	28
44	Albion	166	20 ch	bro pek	1900	65
45	Do	168	21 do	pekoe	1785	49
46	Do	170	19 do	pek sou	1615	44
47	Do	172	4 do	dust	328	27
48	Gongalla	173	20 hf-ch	bro pek	1000	48
49	Do	175	20 do	pek sou	1000	39

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 17th Sept., the undermentioned lots of Tea (25,038 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Heatherton	2	1 hf-ch	dust	85	28
2	Do	3	1 do	bro tea	45	28
3	W Y	4	2 ch	un s	200	37
4	M	5	2 do			
			2 hf-ch	pekoe	300	29
5	R T	6	3 ch	bro mix	300	33
6	Do	7	6 do	dust	720	26
7	P M	8	2 do	fans	300	26
8	Do	9	1 do			
			1 hf-ch	red leaf	144	24
9	Ossington	10	6 do	bro pek	300	45
10	Do	11	5 do	pekoe	250	39
11	Do	12	4 do	pek sou	187	37
12	Do	13	2 do	red leaf	72	28
13	Do	14	1 do	dust	81	25
14	Hardenhuish and Lammermoor	15	5 ch	dust	400	23
15	P	16	2 hf-ch	bro pek	90	66
16	P	17	3 do	pekoe	131	43
17	P	18	13 do	pek sou	726	39
18	P	19	2 do	unas	81	42
19	P	20	1 do	red leaf	34	35
20	P	21	2 do	dust	127	36
21	Harmony	22	13 do	bro pek	650	64
22	Do	23	21 ch	pekoe	1890	42
23	Do	24	4 do	pek sou	360	36
24	Do	25	2 hf-ch	pek fans	140	29
25	Do	26	2 do	bro mix	90	28
26	Caskieben	27	18 do	flowery pek	990	withd'n.
27	Do	28	19 ch	pekoe	1900	withd'n.
28	Do	29	3 do	pek fans	225	withd'n.
33	Ederapolla	34	42 hf-ch	bro pek	2310	59
34	Do	35	46 do	pekoe	2300	48
35	Do	36	21 do	pek sou	1260	41
36	Do	37	1 do	sou	60	34
37	Do	38	2 do	or pek	110	45
38	Do	39	2 do	bro mix	120	45
39	Do	40	1 do	dust	75	28
40	P S	41	1 ch	pekoe	100	35
41	Mousa	42	3 do	unas	300	37
42	Do	43	1 hf-ch	unas	50	37
43	Do	44	2 ch	dust	2.0	25
44	Do	45	1 do	sou	100	31
45	C C	46	2 do	pekoe	180	40
46	Do	47	2 do	unas	192	34
47	S	48	8 do	bro tea	832	28
48	N	49	1 do	fans	140	31
49	Salawe	50	7 hf-ch	bro pek	378	69
50	Do	51	8 do	pekoe	416	47
51	Do	52	20 do	pek sou	1000	41
52	Kuruwitte	53	6 do	bro pek	318	67
53	Do	54	6 do	pekoe	300	48
54	Do	55	9 do	pek sou	450	42
55	Do	56	4 do	unas	224	39
56	Do	57	1 do	dust	79	28
57	Do	58	1 do	congou	46	34

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 17th Sept., the undermentioned lots of Tea (47,926 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	L B K	550	5 ch	red leaf	500	28
2	R M	552	1 do	bro pek	80	36
3	Do	554	1 do	pek mix	85	23
4	Glengariffe	556	8 hf-ch	bro tea	448	44
5	Do	558	2 do	dust	164	24
6	Do	560	1 do	bro pek sou	60	23
7	Kirimattia	562	2 ch	red leaf	208	24
8	Do	564	1 do	dust	99	28
9	S S S	566	1 ch	red leaf	110	35
10	Warwick	568	1 do	dust	82	24
11	Ingiriya	570	6 do	pekoe	630	43
12	M C	572	8 do	dust	960	37
13	Do	574	1 do	unas	116	37
14	Hope	576	2 do	bro mix	252	24
15	Bowlana	578	13 do	bro pek	650	57
16	Do	580	10 do	pekoe	950	43
17	Do	582	14 do	pek sou	1260	41
18	Freds Ruhe	584	25 hf-ch	bro pek	1250	62
19	Do	586	22 ch	pekoe	1980	46
20	Do	588	22 do	pek sou	1980	41
21	W A	590	3 hf-ch	bro pek	150	53
22	Do	592	3 ch	pekoe	270	41
23	Do	594	3 do	pek sou	270	38
24	Do	596	5 do	bro tea	600	38
25	Do	598	1 do	dust	150	26
26	Do	600	1 hf-ch	red leaf	53	34
27	A Z	2	1 ch	bro pek sou	97	33
28	Attabage	4	18 hf-ch	bro pek	900	63
29	Do	6	31 ch	pekoe	2790	41
30	Do	8	6 do	pek sou	540	37
31	Do	10	3 hf-ch	pek fans	210	31
32	Do	12	3 ch	bro mix	135	30
33	Kirrimettia L M	14	9 hf-ch	bro pek	450	56
34	Do	16	38 do	pekoe	1900	42
35	Do	18	3 do	pek fans	225	29
36	Do	20	4 do	bro mix	240	29
37	C F	22	24 do	bro pek	1440	63 bid
38	Do	24	32 do	pekoe No. 1	1600	52
39	Do	26	24 do	pek sou	1200	40
40	Do	28	2 do	dust	190	27
41	Do	30	1 do	red leaf	60	28
42	Do	32	1 box	unas	20	35
43	Goomera	34	35 ch	bro pek	3955	51 bid
44	Do	36	28 do	pekoe	2828	42 bid
45	Do	38	24 do	pek sou	2424	36 bid
46	Tillyrie	40	7 do	pek sou	665	42
47	K	42	2 box	bro pek	30	35
48	K	44	3 hf-ch	pekoe	135	35
49	K	46	2 ch			
			1 box	pek sou	190	33
50	K	48	6 ch	congou	510	33
51	K	50	3 do	bro tea	350	27
52	K	52	1 hf-ch			
			1 box	pek fans	75	29
54	Hethersett	56	10 do	bro or pek	1150	74
55	Do	58	8 do	pekoe	800	60
56	Do	60	9 do	pek sou	810	50
57	Penrhos	62	12 hf-ch	bro pek	720	72
58	Do	64	17 do	pekoe	1020	52
59	Do	66	13 do	pek sou	715	42
60	Do	68	2 do	pek fan	140	34
61	Bandara-polla	70	29 do	bro pek	1450	52
62	Do	72	46 do	pekoe	2300	41
63	Do	74	18 do	pek sou	810	36
64	Midlothian	76	10 do	bro pek	500	60
65	Do	78	6 ch	pekoe	660	43

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 22nd August:—

Ex "Astronomer"—Niabedda, 1b 108s; 2c 1b 107s; 6c 105s; 1c 1b 102s; 1c 126s; 1c 1t 100s; 2 bags 104s. Dambatenne, 1c 1t 105s 6d; 3c 104s 6d; 6c 102s 6d; 1c 1b 100s 6d; 1c 127s 6d.

Ex "Manora"—Amanadowa (MCCCo.), 1t 106s; 2c 1b 104s 6d; 1b 125s. Mahadowa, 1c 107s; 3c 1b 105s 6d; 1c 100s 6d; 1b 124s. Leangawelle, 1c 108s; 1c 1t 106s; 1t 100s 6d; 1b 125s. Kahagalla, 1c 1b 109s; 5c 107s; 2c 1t 106s 6d; 3c 1b 102s 6d; 1c 128s 6d; 2b 105s; 9c 1t 104s 6d; 14c 1b 103s; 1c 2t 119s.

Ex "City of Oxford"—Broughton, 1b 108s; 2c 105s; 1b 99s; 1b 123s. Oovah GA, 4c 106s 6d, 14c 104s 6d; 2c 1t 100s; 1c 122s. Gonamotava, 1c 2b 111s; 5c 107s; 9c 1t 1b 108s 6d; 9c 103s 6d; 2c 127s 6d. Berragalla, 1c 1b 109s; 4c 107s 6d; 1c 101s; 1t 127s.

Ex "Manora"—Craig, 1c 106s; 8c 105s 6d; 4c 101s 6d; 1c 127s; 2c 98s 6d; 8c 105s; 3c 101s 6d; 1t 126s; 1c 1b 98s.

Ex "Golconda"—Mahauva, 2 bags 103s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 29th August:—

Ex "Orizaba"—Gonakelle, 1b 110s; 4c 1b 109s 6d; 6c 106s; 1c 1b 103s; 1c 133s; 2c 98s; 1t 82s; 2 bags 106s; 1 bag 90s. Niabedda, 1b 112s; 2c 1t 110s 6d; 8c 1b 106s 6d; 2c 1b 102s 6d; 2t 132s; 2c 99s 6d; 1c 1b 98s 6d; 1b 99s; 1b 101s; 1 bag 107s; 1 106s; 1 103s; 1 98s. PDM, 1b 98s 6d; 1b 91s; 1 bag 85s.

Ex "Manora"—Kabagalla, 2 bags 102s.

Ex "City of Bombay"—Delmar (OBEC), 1b 105s; 2c 103s 6d; 1c 1t 100s 6d; 1b 106s; 1b 92s.

Ex "Orizaba"—Ouvah JB, 3c 107s 6d; 12c 1t 104s 6d; c 101s 6d; 1t 127s; 1c 1b 123s; 2c 98s; 5 bags 105s; 1 23s 6d. Ouvah GA, 1c 1b 108s; 5c 105s 6d; 1c 1b 105s; 9c 1t 102s; 1b 127s; 1c 123s; 1c 97s 6d; 3 bags 105s 6d; 1 bag 93s 6d.

Ex "Manora"—Coneygar, 1b 105s 6d; 1c 1t 104s; 1c 1t 103s 6d; 1b 117s. Stafford, 1b 105s 6d; 2c 1b 105s; 1c 1t 103s 6d; 1b 126s; 4 bags 96s 6d.

Ex "Goorkha"—Needwood, 1c 108s; 1c 1t 106s 6d; 1c 104s; 1b 128s; 3c 103s; 1t 96s; 1b 104s. Tulloes, 1b 106s 6d; 2c 1b 105s 6d; 1c 1t 104s; 1b 128s; 3 bags 90s 6d.

Ex "India"—Haldummulla, 1 bag 95s 6d.

Ex "Golconda"—Blackwood, 1 bag 95s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 5th Sept.:—

Ex "Parramatta"—Kumaradola, 3b 100s; 1b 96s; 1b 103s; 1b 94s.

Ex "New Guinea"—St. Leonards, 3c 104s 6d; 6c 102s 6d; 1b 108s; 1b 94s; 2 bags 101s 6d; 1 99s; 1 95s.

Ex "Peshawur"—St. Leonards 5c 105s.

Ex "Chyebassa"—Moreland, 2c 96s.

Ex "Goorkha"—Kahagalla, 1b 107s 6d; 2c 1t 106s; 2c 1t 103s 6d; 1b 127s. Ragalla, 3c 105s; 6c 1t 1b 103s 6d; 2b 124s. Leangawelle, 1b 107s 6d; 5c 105s 6d; 2c 1b 103s 6d; 1b 129s; 2 bags 103s; 4 96s; 1 95s. Haputale, 1c 109s 6d; 4c 107s 6d; 1c 103s; 1t 130s; 1 bag 105s 6d; 3 bags 96s. Amanadowa (MCCCo.), 1b 107s; 1c 1t 105s 6d; 1c 103s; 1b 127s; 2 bags 105s 6d. Mahadowa, 1b 106s; 1c 1t 105s 6d; 1c 103s; 1b 125s; 1 bag 104s 6d; 2 bags 96s.

Ex "Orizaba"—Galloola, 1t 1c 104s; 1b 99s; 1b 126s; 1b 96s 6d; 1b 93s 6d.

Ex "Goorkha"—Doomoo, 1c 1b 97s 6d; 1c 1t 103s; 1b 108s; 1b 122s; 1t 1b 94s.

Ex "Parramatta"—Alnwick, 1t 106s 6d; 2c 103s 6d; 1t 123s; 1t 99s 6d; 1 bag 103s. (ST&LC), 1b 90s 6d; 5 bags 91s 6d; 2 92s; 1 94s.

Ex "City of Oxford"—North Matale, 1c 104s; 1 bag 84s.

Ex "Orizaba"—Dynevor, 4 bags 92s 6d.

Ex "Duke of Argyll"—Niabedda, 1c 113s; 4c 1b 110s 6d; 5c 107s; 3c 1t 107s; 1c 1b 104s; 1c 1t 131s; 2c 100s; 1 bag 107s; 1 104s 6d.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)

Mincing Lane, August 22nd, 1890.

Mark	Natural Stem	Renewed	Root
Cranley	2d to 5d	4d to 7d	4½d
Shawlands	3d	...	...
Verelapatna	...	7d	...
Pingarawe	...	5d	...
Lanka Plantations Co., (Ltd.)	3d to 3½d	6d	...
Sherwood, mixed	3½d to 4d	...	...
Hoolo	3d to 3½d	...	...
Hadley	3½d	4½d	...
OBEC, Naranghena	2d to 2½d	...	...
Cottaganga	3d to 3½d	3½d to 4d	..
Campion	3d to 3½d	...	...
Freshwater	...	6d	...
,, hyd.	...	4½d	...
Vedchette	...	3d	...
Hauteville	4d	4½d	...
Hauteville hyd.	3½d	...	...
Woodlake ,,	...	6½d to 7d	...
Warleigh	...	3¼d to 3½d	...
Rangalla	2½d	3d	...
N W E, Wallalawn	...	3½d	...
K. bo	...	2¼d	...
Sandringham	2½d	...	...
St. Margaret's	2½d	3½d	...
Melfort	4d	5d to 5½d	3d
Kataboola, hyd.	4d	4½d to 5d	...
Galkandewatte	2d to 2½d	3½d to 4d	...
MBQ	3l to 3½d	...	...
G, Oya	2½d	3½d	...
ACW in triangle, DWG	3d to 3½d	3½d	...
Lunugalla	3d to 3½d	3d	...
Officinalis.			
Cranley	3½d to 5d	5½d to 8d	...
Badullawatte	...	9d to 9½d	..
Amanadowa	3½d to 4d	...	...
,, hyd.	2¾l to 3d	5½d	...
St. John's	4d	5d to 5½d	...
Diyagama	3½d	6d	7d
Woodlake	...	6d	...
Altion	5d	7d	...
ST&LC, B in diamond	...	6½d	...

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, August 22nd, 1890.

Ex "Ballaarat"—Yattewatte, 20 bags 91s 6d; 2 52s; 1 60s; 2 43s; 1 53s.

Ex "Manora"—Grange, 20 bags 89s.

Ex "Telamon"—Titwella, 1 bag 41s.

Mincing Lane, August 29th, 1890.

Ex "Orizaba"—Dynevor, 6 bags 87s 6d; 1 66s. Sirigalla, 4 bags 71s; 2 55s; 1 49s.

Ex "Manora"—Grange, 7 bags 53s; 2 41s.

Ex "City of Oxford"—Hylton, 13 bags 91s; 5 75s 6d; 2 46s.

Ex "Manora"—Arduthie, 28 bags 89s.

Ex "Ballaarat"—Monerakelle, 48 bags 80s 6d; 3 55s; 2 66s. Palli, 12 bags 87s 6d; 2 62s; 4 64s. Amba, 3 bags 76s; 4 46s.

Ex "Electrician"—Delgolla, 10 bags 92s; 2 66s.

Ex "Astronomer"—Gangadowa, 11 bags 90s; 1 61s.

Ex "Condor"—CW a-b, 7 bags 92s; 4 77s.

Mincing Lane, Sept. 5th, 1890.

Ex "Astronomer"—Guawa Hill, 20 bags 90s; 10 92s.

Ex "Goorkha"—Cocoawatte, 12 bags 90s; 4 64s 6d. Maragalla, 58 bags 90s; 13 65s; 2 60s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, Aug. 22nd, 1890.

Ex "Electrician"—Ambalamana, 2 cases 1s 6d. Amblamana, 1 case 2s.

Ex "Port Fairy"—Laxapanagalla, 3cases 1s 9d.

Ex "Jumna"—Yattewatte, 1 case 1s 5d.

Ex "Liguria"—Deanstone, 1 case 1s 9d.

Ex "Gulf of Martaban"—Knightsdale, 7 cases 2s 1d; 1 case 1s 7d; 3 1s 4d; 3 1s 6d.

Ex "Oroya"—Deanstone, 6 cases 2s 1d; 3 1s 9d; 1 11d. Gampaha, 3 cases 1s 8d; 5 1s 9d. Lesmoir, 1 case 1s 9d; 1 1s 3d; 1 10d.

Mincing Lane, Sept. 5th, 1890.

Ex "Astronomer"—Kitoolmoola, 1 case 2s 1d; 1 2s; 4 1s 4d; 2 11d.

Ex "Brindisi"—KES, 3 cases 4d.

No. 21.] COLOMBO, OCTOBER 10, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. E. BENHAM & Co. put up for sale at the Chamber of Commerce Sale-room today, 24th Sept., the undermentioned lots of Tea (9,955 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Wangieoya	32	13 hf-ch	bro or pek	780	74
2	Do	34	15 ch	or pek	1650	62
3	Do	36	8 do	pekoe	800	48
4	Do	38	9 do	pek sou	900	42
5	St. Leys	40	11 do	bropek	1155	55 bid
6	Do	42	8 do	pekoe	720	43
7	Do	44	2 do	pek sou	180	37
8	Vallambrosa	46	13 hf-ch	bro pek	650	80
9	Do	48	25 ch	pekoe	1875	58
10	Do	50	4 do	pek sou	300	44
11	L F	52	8 do	dust	880	28
12	Do	54	1 do	bro mix	65	33

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room today, 24th Sept., the undermentioned lots of Tea (51,929 lb.), which sold as under:—

Lot. No	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	N	177	8 ch	bro tea	720	33
2	Ayr	178	2 hf-ch	fans	92	35
3	Do	179	3 do	congou	129	35
4	Do	180	17 do	pek sou	680	41
5	Do	182	18 do	pekoe	792	46
6	Do	184	16 do	bro pek	768	64
7	Marguerita	186	20 do	bro pek	1200	71
8	Do	188	15 do	pekoe	750	58
9	Do	190	24 do	pek sou	1320	43
10	Do	192	5 do	dust	375	28
11	Do	193	1 do	bro mix	50	25
12	Do	194	2 do	sou	90	36
13	Tellisagalla	195	10 ch	bro pek	1000	49
14	Do	197	8 do	pekoe	640	43
15	Do	199	9 do	pek sou	675	40
16	Do	201	2 hf-ch	dust	120	28
17	Do	202	1 do	bro pek Nos. 2	48	32
18	Kanangama	203	12 ch	bro pek	1260	47
19	Do	205	12 do	pekoe	1140	40 bid
20	F	207	23 do	pek sou	2070	37
21	F	209	12 do	fans	1140	33
22	Ivies	211	20 hf-ch	bro pek	1000	60
23	Do	213	24 do	pekoe	1200	51
24	Do	215	12 ch	pek sou	1080	43
25	Do	217	1 hf-ch	dust	70	22
26	Wariapolla	218	18 do	sou	900	35
27	Little Valley	220	11 ch	bro pek	990	57
28	Do	222	18 do	pekoe	1530	50
29	Do	224	1 hf-ch	dust	72	24
37	Bowhill	236	2 ch	pek sou	190	32
38	Do	237	2 do	pek dust	280	28
39	Keenagaha Ella A	238	4 hf-ch	bro pek	260	52
40	Do	239	5 do	or pek	300	53
41	Do	241	8 ch	pekoe	800	45
42	Do	243	14 do	pek sou	1300	40
43	Keenagaha Ella B	245	5 hf-ch	bro pek	325	55
44	Do	247	2 ch	pekoe	200	44
45	Do	248	5 do	pek sou	475	40
46	Do	250	1 hf-ch	sou	55	36
47	Do	251	1 do	fans	65	36
48	Do	252	1 ch	dust	165	26
49	Do	253	2 hf-ch	bro mix	190	30
50	Alnoor	254	4 do	bro or pek	160	58
51	Do	255	9 do	bro pek	360	45
52	Do	257	7 do	pekoe	280	40
53	Do	259	2 do	congou	80	33
54	Do	260	1 do	fans	50	35
59	N K	269	3 do			
			1 hf-ch	fans	400	33
60	Do	270	4 ch	dust	480	27
61	Do	271	9 do			
			1 hf-ch	congou	760	33
62	Do	273	3 ch			
			1 hf-ch	red leaf	258	31
63	Logan	275	1 box	dust	25	27
64	Lawrence	275	25 ch	sou	2500	38
65	Do	277	3 hf-ch	dust	240	23

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 24th Sept., the undermentioned lots of Tea (24,773 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight lb.	c.
7	Nabalma	11	19 do	bro pek	1045	60
8	Do	13	20 ch	pekoe	2000	45
9	Do	15	1 hf-ch	dust	75	26
10	Woodend	16	11 ch	bro pek	1155	55
11	Do	18	16 do	pekoe	1600	42
12	Do	20	5 do	pek sou	475	37
13	Do	22	2 do	bro tea	240	30 bid
14	Do	23	1 do	congou	95	28 bid
15	Agraoya	24	13 hf-ch	bro pek	650	60
16	Do	26	1 ch	pekoe No. 1	100	45
17	Do	27	7 do	do „ 2	700	40 bid
18	Do	29	1 hf-ch	dust	68	27
19	Dunottar	30	14 ch	bro pek	1400	55
20	Do	32	7 hf-ch	or pek No. 1	420	68
21	Do	34	12 do	do „ 2	720	66
22	Do	36	6 ch	pekoe „ 1	540	47
23	Do	38	2 hf-ch	do „ 2	110	40
24	Do	39	2 ch	sou	180	37
25	Do	40	2 hf-ch	fans	100	37
26	Do	41	2 ch	dust	280	26
27	M	42	13 do	pek sou	975	34

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 24th Sept., the undermentioned lots of Tea (23,084 lb.) which sold as under:—

Lot No.	Mark.	Box No.	Pkgs.	Description.	Weight lb.	c.
1	C T M	59	3 ch	bro mix	270	32
2	Do	60	3 hf-ch	dust	210	25
3	D G	61	8 do	fans	440	38
4	Do	62	3 do	bro pek fans	165	41
5	Do	63	5 do	bro mix	250	33
6	Do	64	3 do	dust	300	25
7	P	65	1 ch	bro mix	120	31
8	P	66	2 do	dust	255	26
9	D G A	67	2 hf-ch	dust	150	26
10	Do	68	2 do	fans	120	33
11	Do	69	3 do	bro mix	165	36
12	H	70	1 ch	dust	150	28
13	I P	71	12 do	bro tea	1140	29
14	Kattukitula	72	1 hf-ch	bro pek	50	53
15	Do	73	2 do	pekoe	80	46
16	Do	74	2 do	pek sou	100	36
17	Dalguise	75	8 ch	bro pek	800	68
18	Do	76	15 do	pekoe	1500	48
19	Do	77	3 do	pek sou	300	40
20	Do	78	1 do	dust	120	26
21	Lyndhurst	79	6 ch	bro pek	620	61
22	Do	80	9 do	pekoe	810	44
23	Do	81	13 do	pek sou	1170	39
24	Do	82	1 do	dust	120	25
25	K K	83	3 do			
			1 hf-ch	pekoe	350	28 bid
26	Do	84	1 ch	dust	109	23
27	P S	85	3 do	bro tea	300	30
28	Goonambil	86	14 hf-ch	bro pek	840	68
29	Do	87	11 ch	pekoe	990	48 bid
30	Ellawatta	88	8 do	bro pek	800	68
31	Do	89	8 hf-ch	pekoe	416	47 bid
32	Salawe	90	24 do	unas	1200	39
33	Do	91	2 do	dust	144	25
34	H	92	1 ch	bro pek	102	32
35	H	93	2 do	pek sou	172	28
36	H	94	2 do	pek fans	226	28
37	H	95	7 hf-ch	pek dust	511	25
38	Vincit	96	5 ch	bro or pek	525	55
39	Do	97	4 do	pek No. 1	400	42
40	Do	98	4 do	pekoe	400	39
41	Do	99	5 do	pek sou	500	35 bid
42	Do	100	1 do	congou	100	30
43	Do	1	1 pkg	dust	75	27
44	Kurulugalla	2	10 hf-ch	bro pek	600	63 bid
45	Do	3	10 do	pekoe	605	48
46	Do	4	10 do	pek sou	500	41
47	Do	5	5 do	sou	250	33
48	Do	6	1 do	dust	50	25
52	M K	10	8 do	bro pek	896	55 bid
53	Do	11	7 do	pekoe	700	43 bid
54	Do	12	6 do	pek sou	600	38 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 24th Sept., the undermentioned lots of Tea (106,816 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	L G E	80	3 hf-ch	or pek	180	49
2	Do	82	3 do	pekoe No. 1	165	41
3	Eadella	84	1 ch	sou	80	45
4	Do	86	1 do	dust	130	26
5	Do	88	1 do	red leaf	80	31
6	Andangodde	90	2 do	sou	170	36
7	Do	92	4 do	dust	520	26
8	Do	94	1 do	red leaf	80	32
9	N P	96	3 do	sou	255	35
10	Do	98	5 do	dust	650	26
11	Do	100	15 do	red leaf	1200	34
12	Citrus	102	5 hf-ch	bro pek	300	57
13	Do	104	12 do	pekoe	644	46
14	Do	106	9 do	pek sou	442	41
15	D	108	17 do	bro pek	850	32
17	Ismalle	112	1 hf-ch	bro mix	50	32
18	Do	114	3 do	dust	225	26
19	Daphne	116	2 ch	bro pek	200	59
20	Do	118	1 do	pekoe	100	42
21	Do	120	2 do	pek sou	200	41
22	Do	122	1 hf-ch	sou	55	29
23	Do	124	16 do	unas	720	41
24	H	126	1 do	congou	50	32
25	H	128	1 do	dust	66	20
26	H	130	11 do	unas	550	36
27	H	132	30 box	unas	300	37
28	Fetteresso	134	5 ch	sou	450	39
29	Do	136	1 do	dust	140	23
30	D	138	5 do	bro pek	485	52
31	D	140	5 do			
			1 hf-ch	pek No. 1	546	44
32	D	142	3 ch			
			1 hf-ch	do ,, 2	350	39
33	D	144	1 do	dust	74	21
34	D	146	1 ch	do	166	25
35	Walahan-dua	158	9 hf-ch	bro pek	585	56
36	Do	160	13 do	pekoe	715	43
37	Do	162	7 do	pek sou	350	35
38	S P A	164	1 do	bro pek	60	48
39	Do	166	2 do	pekoe	100	41
40	Do	168	4 do	sou	200	37
41	Do	170	1 do	fans	50	37
42	Do	172	1 do	bro mix	62	37
43	Do	174	1 do	bro tea	50	36
44	Do	176	1 do	fans	60	37
45	Do	178	2 do	bro tea	84	35
46	Do	180	2 do	sou	100	37
47	Do	182	2 do	bro mix	110	36
48	Do	184	1 do	dust	85	27
49	Do	186	4 do	sou	200	37
50	Galdola	188	2 do	bro pek	110	50
51	Do	190	2 do	pekoe	110	43
52	Do	192	1 do	pek sou	50	37
53	Do	194	2 do	sou	100	37
54	I G	196	2 ch	bro tea	180	36
55	Kirrimettia	198	7 do	bro tea	728	39
56	Do	200	1 do	red leaf	104	36
57	Koladenia	202	5 do	bro tea	639	32
58	V O	204	4 do	bro tea	400	32
59	Do	206	5 do	dust	560	25
60	Hatale	210	14 do	bro pek	1596	58
61	Do	212	12 do	or pek	1020	51
62	Do	214	25 do	pekoe	2500	44
63	Do	216	18 do	pek sou	1872	40
64	Do	218	1 do	sou	109	35
65	H W	220	18 hf-ch	bro pek	900	58
66	Do	222	46 do	pekoe	2300	47 bid
67	Do	224	20 do	pek sou	1000	44
68	Lucbombe	226	22 ch	bro or pek	1980	53
69	Do	228	78 do	pekoe	7020	39
70	Do	230	17 do	pek sou	1530	37
71	Do	232	5 do	pek fan	450	27
72	L	234	2 do			
			1 hf-ch	sou	190	35
73	L	236	4 ch	bro tea	300	32
74	L	238	1 do			
			1 hf-ch	dust	227	26
75	Castle-naugh	240	23 do	bro or pek	1150	67
76	Do	242	23 ch	pekoe	2300	53
77	St. Helen	244	21 do	bro pek	1890	56
78	Do	246	13 do	pekoe	1170	45 bid
79	Do	248	12 do	pek sou	1080	40
80	Do	250	1 do	pek fan	90	26

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
81	H Ouvah-kelle	252	1 hf-ch	dust	80	30
82	Melrose	254	47 do	bro pek	2820	53
83	Do	256	45 do	pekoe	2475	45
84	Do	258	22 ch	pek sou	2860	39
85	Do	260	4 hf-ch	dust	348	25
86	Do	262	2 ch	congou	220	36
87	Do	264	2 hf-ch	pek dust	144	28
88	B & D	266	1 ch	red leaf	108	32
89	Middleton	268	37 hf-ch	bro pek	2072	70
90	Do	270	14 ch	pekoe	1400	51
91	M	272	18 hf-ch	bro pek	1170	68
92	M	274	7 ch	pekoe	700	54
93	A P C	276	42 hf-ch	bro pek	2310	63
94	Do	278	21 do	pek sou	1260	44
95	Do	280	8 do	pek sou	416	49 bid
96	Do	282	5 ch	bro tea	600	39
97	H	284	1 box	or pek	10	44
98	H	286	4 do	unas	40	37
99	Good Hope	288	9 do	dust	225	28
100	Do	290	3 do	bro mix	60	29
101	Do	292	2 do	congou	40	32
102	N	294	12 hf-ch	sou	600	39
103	N	296	4 do	dust	300	27
104	N	298	1 do	bro mix	50	32
105	G T W	300	5 do	dust	381	27
106	Do	302	3 do	pek sou	150	36
107	R L	304	3 do	bro mix	150	25
	(The Yatiyantota Tea Co., Limited.)					
108	Polata-gama	306	33 hf-ch	bro pek	1650	64
109	Do	308	49 do	pekoe	2450	50
110	Do	310	70 do	pek sou	3500	44
111	Farnham	312	22 do	bro or pek	1100	69
112	Do	314	23 do	pekoe	1035	50
113	Do	316	58 do	pek sou	2610	41
114	Do	318	2 do	fans	120	36
115	Do	320	2 do	dust	130	25
116	Do	322	9 do	bro tea	405	34
117	M A	324	14 ch	bro pek	1400	54
118	Court Lodge	326	15 hf-ch	bro pek	870	85
119	Do	328	13 do	pekoe	611	67
120	Do	330	16 do	pek sou	720	55
121	Do	332	1 ch	sou	69	47
122	Do	334	1 do	dust	146	28
123	Horagas-kelle	336	2 hf-ch	bro pek	132	55
124	Do	338	5 do	pekoe	280	44
125	Do	340	10 do	pek sou	560	38
126	Do	342	1 do	congou	56	35
127	Do	344	1 do	bro mix	81	34
128	Mukeloya	346	14 do	bro pek	770	67
129	Do	348	12 do	pekoe	600	50
130	Do	350	24 do	pek sou	1200	39
131	Do	352	1 do	dust	80	28
132	Penshurst, Travancore	354	14 do	bro pek	910	76 bid
133	Do	356	6 do	pekoe	300	53 bid
134	Do	358	17 do	pek sou	765	41 bid
135	K P, Travancore	360	6 do	unas	300	43 bid
136	Madool-kelly	362	2 ch	pek fans	252	24
137	Do	364	1 do	bro tea	120	34
138	Bismark	366	1 do	fans	139	44
139	Do	368	3 do	dust	350	27
140	Avisawella	370	3 do	dust	450	28
141	Do	372	3 do	unas	315	27
142	Clunes	374	21 hf-ch	bro pek	1050	57
143	Do	376	40 do	pekoe	1800	43
144	Do	378	29 do	pek sou	1450	38
145	Singleton	380	15 do	bro pek	870	55
146	Do	382	11 do	pekoe	594	44 bid
147	Do	384	15 do	pek sou	750	41
148	M O	386	3 do	bro pek	180	54
149	Do	388	9 do	pekoe	495	45
150	Do	390	3 do	pek sou	150	37
151	Nugagalla	392	12 do	bro or pek	600	80
152	Do	394	36 do	pekoe	1800	58
153	Do	396	1 do	pek sou	56	41
154	Do	398	2 do	dust	160	28
155	Lankapura M	400	4 do	bro pek	200	68
156	Do	402	9 ch			
			1 hf-ch	pekoe	855	52 bid
157	Do	404	2 ch	pek sou	180	44
158	Do	406	1 do	sou	70	38
159	Do	408	2 hf-ch	fans	140	39
160	Do	410	1 do	dust	75	26
161	M	412	1 do	red leaf	45	27
162	K M	414	1 do	unas	45	40

☞ "Not arrived" parcels are omitted.

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 1st Oct., the undermentioned lots of Tea (36,725 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	C C	14	4 ch 1 hf-ch	pekoe	450	33
2	Do	15	3 ch	bro tea	300	29
3	A A	16	4 do	pekoe	400	34
4	Do	17	4 hf-ch	pek sou	190	31
	(Bulked.)					
5	Depedene	18	5 hf-ch	bro pek	250	73
6	Do	19	8 do	pekoe	400	55
7	Do	20	13 do	pek sou	650	43
	(Bulked.)					
8	H D	21	8 hf-ch	bro tea	400	38
9	Do	22	4 do	bro mix	200	34
10	Hatdowa	23	3 do	bro pek	150	55
11	Do	24	7 do	bro tea	350	37
	(Bulked and Hooped.)					
12	South Wanna-Rajah	25	12 ch	bro pek	1200	84
13	Do	26	28 do	pekoe	2800	56
14	Do	27	7 do	pek sou	700	48
	(Bulked and Hooped.)					
15	Wishford	28	15 hf-ch	bro pek	900	70
16	Do	29	13 ch	pekoe	1300	55
17	Do	30	4 ch	pek sou	392	44
18	Do	31	1 hf-ch	pek dust	80	28
	(Hooped.)					
19	K T G	32	15 ch	pekoe	1200	42 bid
20	Do	33	6 do	sou	480	38 bid
21	Do	34	1 do	dust	125	26
	(Hooped.)					
22	B V A	35	18 hf-ch	bro pek	1080	58 bid
23	Do	36	12 ch	pekoe	1200	44 bid
24	Do	37	12 do	pek sou	1320	39 bid
25	Do	38	1 hf-ch	dust No. 1	75	27
	(Bulked and Hooped.)					
26	Narangoda	39	20 ch	unas	2000	46
27	Do	40	1 hf-ch	dust	70	27
	(Bulked.)					
28	Wewesse	41	13 hf-ch	bro pek	715	66 bid
29	Do	42	14 do	pekoe	770	51
30	Do	43	13 do	pek sou	715	45
31	Do	44	4 do	sou	220	37 bid
32	Do	45	2 do	pek fans	140	37
	(Bulked and Hooped.)					
33	Killin	46	2 ch	bro pek	200	51
34	Do	47	3 do	pekoe	300	43
35	Do	48	2 do	pek sou	200	40
36	Do	49	1 do	bro tea	100	33
	(Hooped.)					
37	Kalugalla	50	14 hf-ch	or pek	732	73
	(Hooped.)					
38	Udugama	51	3 ch	bro pek	300	60
39	Do	52	8 do	pekoe	720	46
40	Do	53	3 do	pek sou	300	39
	(Hooped.)					
41	Wereagalla	54	12 ch	bro pek	1260	67
42	Do	54	12 do	pekoe	1080	50
43	Do	56	16 do	pek sou	1360	45
44	Do	57	1 do	dust	130	29
45	Do	58	2 do	bro tea	220	42
46	Do	59	1 do	congou	85	34
47	Do	60	1 do	red leaf	80	34
	(Hooped.)					
48	Wereagalla	61	14 ch	bro pek	1400	66
49	Do	62	18 do	pekoe	1530	49
50	Do	63	22 do	pek sou	1760	45
51	Do	64	1 do	bro tea	110	41
52	Do	65	1 do	dust	130	26
	(Hooped.)					
53	M A H	66	6 ch	congou	540	35
54	Do	67	2 do	red leaf	180	28
	(Bulked.)					
55	Silverton	68	14 hf-ch	bro pek	770	54 bid
56	Do	69	24 do	pekoe	1200	47 bid
	(Hooped.)					
57	V	70	1 pkg	dust	75	27
56	X	71	3 ch 1 hf-ch	pekoe	320	31
59	T	72	3 do	sou	133	33
60	T	73	2 ch	pek fans	192	30
61	T	74	1 do	red leaf	86	27

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 1st Oct., the undermentioned lots of Tea (47,176 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
	(Hooped.)					
1	F	416	4 ch	red leaf	440	33
2	D D (in estate mark)	418	1 do	bro pek	100	47
3	Do	420	1 do	pekoe	90	47
4	Do	422	1 do	pek sou	80	38
5	Do	424	3 do	bro pek sou	270	37
6	D D (in estate mark)	426	4 do	bro pek	400	57
7	Do	428	2 do	pekoe No. 1	200	49
8	Do	430	4 do	pekoe ,, 2	400	43
9	Do	432	4 do	pek sou	400	42
	(Hooped.)					
10	Gonamotava	434	1 hf-ch	bro pek	55	60
11	Do	436	4 ch	sou	360	42
12	Do	438	1 hf-ch	sou	50	42
13	Do	440	9 ch	fans	990	38
14	Do	442	1 hf-ch	fans	75	39
15	Do	444	3 ch	dust	540	25
16	Do	446	8 do	bro mix	800	44
	(Bulked and Hooped.)					
18	O O O O O	450	14 hf-ch	bro or pek	700	76
19	Do	452	19 ch	pekoe	1710	53
20	Do	454	1 do	red leaf	86	37
	(Hooped.)					
21	Chesterford	456	18 hf-ch	bro pek	1080	68
22	Do	458	29 do	pekoe	1450	47
	(The Ceylon Tea Plantation Co., Limited.)					
	(Bulked and Hooped.)					
23	Mariawatte	460	20 ch	or pek	1800	60
24	Do	462	29 do	pekoe	2610	52
25	Do	464	20 do	pek sou	1800	43
26	Alton	466	22 hf-ch	bro pek hooped	1500	71
27	Do	468	15 ch	pekoe metal	1440	50
28	Do	470	6 hf-ch	pek sou hooped	300	44
29	Do	472	80 box	bro pek	960	75
30	Do	474	34 do	pekoe hooped	612	53
31	Do	476	10 hf-ch	pek sou	500	43
32	Do	478	6 do	pek sou	270	39
33	Do	480	4 do	red leaf	180	33
	(The Yataderia Tea Company, Limited.)					
	(Bulked and Hooped.)					
34	Yataderia	482	19 ch	bro pek	2033	54 bid
35	Do	484	37 do	pekoe	3441	46
36	Do	486	16 do	pek sou	1408	42
	(Bulked.)					
37	Y	488	7 ch	bro tea	658	36
38	Y	490	3 do	pek fans hooped	300	27
39	Y	492	4 do	pek sou	372	36
40	Doonevale	494	12 do	pek sou	1080	43
41	W G	496	1 hf-ch	red leaf	50	33
42	Do	498	2 do	pek dust	170	29
48	K V	510	1 ch	fans	100	34
49	T	512	6 do	pek sou	510	37
50	T	514	1 do	sou	100	33
51	T	516	9 hf-ch	bro mix	540	35
52	T	518	3 do	pek dust	240	27
53	Lillyrie	520	15 ch	pek sou	1425	45
	(Bulked and Hooped.)					
54	Bandarapolla	522	22 hf-ch	or pek	1100	61
55	Do	524	19 do	bro pek	950	52 bid
56	Do	526	43 do	pekoe	2150	48
57	Do	528	26 do	pek sou	1170	42
58	Penrhos	530	4 do	dust	300	28
59	Do	532	4 do	congou	200	39
	(Bulked and Hooped.)					
60	Theberton	534	14 ch	bro pek	1400	47
61	Do	536	5 do	pekoe	500	45
62	Do	538	4 do	pek sou	400	37
63	Do	540	1 do	dust	100	26
	(Hooped.)					
64	W A	542	4 ch	or pek	315	42
65	H	544	3 hf-ch	pek sou	150	39
66	H	546	2 do	sou	120	30
67	H	548	3 ch	unas	280	32
68	H	550	2 hf-c	pek dust	120	27

☞ "Not arrived" lots are omitted.

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today 1st Oct., the undermentioned lots of Tea (17,513 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Bogahagoda-watte	44	3 hf-ch	bro pek	180	52
2	Do	45	5 do	pekoe	250	45
3	Do	47	9 do	bro tea	540	39
4	Do	49	1 do	fans	60	29
5	Do	50	1 do	dust	75	27
11	P O	59	2 hf-ch	bro pek	108	65
12	Do	60	3 do	pekoe	135	47
13	Do	61	8 do	pek sou	407	42
14	Do	63	1 do	unas	42	40 bid
15	Do	64	1 do	dust	60	29
	(Factory Bulked and Hooped.)					
16	F (in estate mark)	65	15 ch	sou	1200	38
	(Factory Bulked and Hooped.)					
17	Nahalma	67	21 hf-ch	bro pek	1155	68
18	Do	69	21 ch	pekoe	2100	46
	(Factory Bulked and Hooped.)					
19	Engurakande	71	7 hf-ch	bro pek	371	61
20	Do	73	7 ch	pekoe	700	44
21	C M	75	4 hf-ch	bro pek	220	56
22	Do	76	8 do	pekoe	400	40
23	Do	78	8 do	pek sou	400	38
24	W D	80	2 ch	bro tea	210	32
25	Do	81	1 do	congou	95	31

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 1st Oct., the undermentioned lots of Tea (44,496 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
	(Hooped.)					
6	Ardlaw	22	8 hf-ch	bro pek	416	69
7	Do	24	7 ch	pekoe	665	49
8	Do	26	2 hf-ch	bro tea	92	40
9	Do	27	1 do	bro or pek	54	70
	(Bulked and Hooped.)					
10	Labugama	28	14 hf-ch	pek sou	560	66
11	Do	30	14 do	pekoe	560	51
12	Do	32	5 do	pek sou	200	44
13	Do	34	2 do	bro or pk	120	62
14	Do	35	7 do	sou	280	44
15	Do	37	4 do	pek fans	180	40
16	Do	38	2 do	unas	80	40
	(Bulked and Hooped.)					
17	Brownlow	39	18 ch	or pek	1890	76
18	Do	41	51 do	pekoe	1350	57
19	Do	43	12 do	pek sou	960	47
20	Do	45	1 do	dust	120	27
21	B T	46	22 do	bro mix	1870	36
	(Hooped.)					
22	Madooltenne	48	12 ch	bro pek	1320	59
23	Do	50	12 do	pekoe	1200	47
24	Do	52	12 do	pek sou	1140	42
	(Bulked and Hooped.)					
25	Anchor (in estate mark)	54	20 hf-ch	bro pek	1100	68
26	Do	56	27 ch	pekoe	2700	54
27	Do	58	18 do	pek sou	1800	45
28	Do	60	13 do	pek sou	1300	50
	(Bulked.)					
29	Dickapittia	62	20 ch	bro pek hooped	2000	60
30	Do	64	18 hf-ch	pekoe	864	50
31	Do	66	18 do	pek sou	900	44
32	Do	68	2 ch	sou hooped	136	39
33	Do	69	1 hf-ch	dust ,,	37	26
	(Bulked and Hooped.)					
34	Goweravilla	70	25 hf-ch	or pek	1250	73
35	Do	72	21 ch	pekoe	2100	53
36	Do	74	5 do	pek sou	500	47
37	Do	75	1 hf-ch	bro mix	75	38
38	Do	76	1 do	dust	55	26
	(Bulked and Hooped.)					
39	Cruden	77	22 hf-ch	flowery or pek	1100	74
40	Do	79	23 ch	flowery pek	2300	55
41	Do	81	6 do	flowery pek sou	600	44
42	Do	83	2 do	sou	200	39
43	Do	84	1 do	bro mix	75	40
44	Do	85	1 hf-ch	dust	55	25
	(Bulked and Hooped.)					
45	Albion	86	27 hf-ch	bro pek	1485	68
46	Do	88	16 ch	pekoe	1280	53
47	Do	90	12 do	pek sou	960	44
48	Do	102	2 do	dust	170	27
49	Logan	103	19 hf-ch	bro pek	950	60
50	Do	105	23 do	pekoe	1035	52
51	Do	107	30 do	pek sou	1350	45
52	Do	109	10 do	sou	450	41
53	Do	111	3 do	red leaf	135	37
54	Do	112	4 do	dust	260	28
55	A N	113	1 ch	bro pek	64	51
56	Do	114	1 do	pekoe	72	43
57	Do	115	1 do	pek sou	83	40
	(Bulked and Hooped.)					
58	P G K	116	4 ch	sou	232	36
59	Do	117	2 do	dust	246	26
	(Bulked and Hooped.)					
60	Abbotsford	119	11 ch	bro pek	1100	61 bid
61	Do	121	10 do	pekoe	800	53
62	Do	123	7 do	pek sou	560	43 piq

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, September 12th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 12th Sept.:—

Ex "Goorkba"—Uva Estate, 1c 106s 6d; 1c 103s; 1b 118s; 1b 96s 6d. Pittarat Malle, 1t 105s; 1b 1c 104s 6d; 1c 102s 6d; 1t 126s; 1b 97s 6d; 1 bag 105s; 1 bag 97s. Ouvah GA, 2c 107s; 3c 1b 104s; 2c 102s 6d; 1b 115s 6d; 1t 1c 104s 6d; 3 bags 105s.

Ex "Parramatta"—Ouvah JB, 1c 107s; 5c 1t 104s; 1t 1c 102s; 1b 115s 6d; 1c 1b 98s 6d; 2 bags 104s 6d.

Ex "Oroya"—Gampaha, 1t 108s; 4c 106s 6d; 3c 1b 104s; 1c 104s 6d; 1c 1b 101s; 1t 125s. Delmar (OBEC), 2c 103s 6d; 3c 1t 102s; 1c 117s; 1t 96s 6d; 1 bag 103s; 5 bags 93s.

Ex "Parramatta"—Gonamotava, 1b 110s; 3c 1b 108s; 6c 104s 6d; 1t 131s; 1c 99s; 3 bags 105s. Hiralouvah, 1t 110s; 3c 108s 6d; 1t 103s 6d; 1b 132s; 1b 99s 6d; 1 bag 103s 6d.

Ex "Goorkha"—YLT, 3 bags 96s 6d.

Ex "Parramatta"—Meddecombra, 1b 107s; 1c 1t 109s 6d; 1c 105s; 1b 100s 6d; 1t 136s; 1b 97s 6d; 1 bag 103s.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)

Mincing Lane, Sept. 12th, 1890.

Mark	Natural Stem	Renewed	Root
Cobo	...	4d to 6½d	...
MHM, in diamond, Calisaya	2d	...	...
Holbrook	2½d	4d	4½d
Pingarawe	3½d	...	...
Newton Dikoya	3d	4½d	4d
Merisketiya, hyd.	...	5½d	...
West Holyrood	2½d	...	...
Sherwood	3d to 3½d	5d to 5½d	...
Tulloes	...	5d to 5½d	...
Iona, J J H	2½d	3¾d	...
Theresia	2½d to 3d	4½d	3d
Claverton	3½d	4½d	...
CPC, G in dia.	2½d to 3½d	3½d to 5½d	...
FRS, K do	3½d	4d to 6d	3d
K, V do	3d to 5½d	4d to 7½d	...
S, K do	2½d to 4d	3d to 6d	2½d to 3d
WSF, D do	2½d to 3d	4d to 4½d	...
Kallebokka	2d to 3d	4½d to 5d	3d
Wattakelly	2d to 3d	5d	4½d
Officinalis.			
MCC Co. in dia	4d to 5d	...	7½d
Beaumont, ledger	5d to 5½d	...	...
Gracelyn	5½d	11d	9½d
Claverton	2¾d to 5d	5d	5d

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, Sept. 12th, 1890.

Ex "Bellerophon"—Maryland, 2 bags 63s 6d.
Ex "Telemachus"—(J), 1 bag 61s.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 22.] COLOMBO, OCTOBER 23, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. BENHAM put up for sale at the Chamber of Commerce Sale-room today, 8th Oct., the as dermentioned lots of Tea (6,850 lb.), which sold un-under :—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Wangieoya	2	19 hf-ch	bro or pek	1140	74 bid
2	Do	4	21 ch	or pek	2310	63 bid
3	Do	6	14 do	pekoe	1400	50
4	Do	8	13 do	pek sou	1300	42
5	R	10	5 ch	dust	700	26

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 8th Oct., the undermentioned lots of Tea (64,899 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	P E E	125	2 ch	fans	180	35
2	Do	126	1 hf-ch	dust	85	30
3	Killaloo	127	36 ch	sou	3240	36
4	Do	129	15 do	unas	1200	28
5	Clontarf	131	4 ch	bro pek	400	65 bid
6	Do	133	10 do	or pek	900	55
7	Do	135	10 do	pekoe	800	47
8	Do	137	1 do	bro mix	100	36
9	M	138	1 ch			
			2 hf-ch	pek sou	190	31
10	F T	139	28 hf-ch	bro pek	1540	55 bid
11	Do	141	15 do	pekoe	750	46 bid
12	Do	143	13 ch	pek sou	1300	40 bid
13	Do	144	2 do	bro mix	160	34 bid
14	Glenorchy	145	1 bf-ch	unas	50	45
15	H J R	146	9 ch	bro pek	855	60
16	Do	148	10 do	pekoe	800	44
17	Do	150	8 do	pek sou	680	38
18	Do	152	1 bf-ch	dust	80	26
19	Alnoor	153	4 hf-ch	bro or pek	200	55
20	Do	154	6 do	bro pek	300	45
21	Do	156	6 do	pekoe	300	41
22	Do	158	2 do	congou	100	34
23	Do	159	2 do	fans	100	31
24	Esperauza	160	2 do	bro or pek	112	44 bid
25	Do	161	9 do	or pek	450	67
26	Do	163	35 do	pekoe	1470	55
27	Do	165	1 do	dust	90	26
28	Anchor (in estate mark)	166	19 hf-ch	bro pek	1045	68
29	Do	168	27 do	pekoe	2700	62 bid
30	Do	170	14 do	pek sou	1400	54
31	Do	172	6 do	bro tea	690	32
32	Dunbar	174	9 ch	bro pek	1008	67
33	Do	176	7 do	pekoe	770	52
34	Mocha	178	43 hf-ch	bro pek	2365	72
35	Do	180	31 ch	pekoe	3100	57
36	Do	182	13 do	pek sou	1235	48 bid
37	Eilandhu	184	4 hf-ch	bro or pek	220	51
38	Do	186	11 ch	bro pek	825	59
39	Do	188	18 do	pekoe	1350	46
40	Do	190	8 do	pek sou	600	39
41	Do	192	1 hf-ch	bro tea	50	32
42	Ellis	193	6 ch	pekoe	431	40
43	Pata Rajah	195	3 do	bro pek	270	43
44	Do	196	5 do	pekoe	400	36
45	Yahala Kela	198	9 hf-ch	or pek	450	64
46	Do	200	16 do	pekoe	768	49
47	Do	202	10 do	pek sou	480	41
48	Do	204	7 do	unas	350	40
49	Gonavy	206	19 ch	bro pek	1900	80
50	Do	208	4 do	pekoe	360	56
51	Do	210	4 do	pek sou	360	47
52	Do	212	1 hf-ch	dust	75	37
70	Great Valley	238	34 ch	bro pek	3400	57
71	Do	240	22 ch	pekoe	1980	46 bid
72	Do	242	34 ch	pek sou	2890	41 bid
73	Kuranda Oya	244	18 hf-ch	bro pek	1080	75
74	Do	246	32 do	pekoe	1740	57
80	Glencorse	253	12 ch	bro pek	1235	63
81	Do	255	30 hf-ch	pekoe	1350	48
82	Do	257	24 do	pek sou	1080	42
83	Do	259	2 ch	dust	300	26
84	Do	260	1 do	bro tea	55	36

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 8th Oct., the undermentioned lots of Tea (48,433 lb.), which sold as under:—

Lot No.	Mark.	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Glanrhos	51	6 ch	bro pek	570	52
2	Do	53	11 do	pekoe	990	44
3	Do	55	8 do	pek sou	720	38
4	Do	57	1 do	fans	100	30
5	Do	58	2 do	congou	160	32
6	Kanangama	59	21 ch	bro pek	2205	43 bid
7	Do	61	12 do	pekoe	1140	41
8	Do	63	16 do	pek sou	1440	35
9	A K A C (in estate mark)	65	12 hf-ch	bro pek	600	66
10	Do	67	39 do	pekoe	1950	48
11	Do	69	7 do	pek sou	350	38
12	Do	71	3 do	fans	161	33
13	Do	72	1 do	dust	72	27
14	Patulpana	73	4 do	bro pek	219	48
15	Do	74	6 do	pek sou	324	37
16	Do	76	1 ch	bro mix	51	30
17	Agar's Land	77	41 hf-ch	bro or pek	2050	66 bid
18	Do	79	45 do	pekoe	2250	53
19	Do	81	32 do	pek sou	1440	40 bid
20	S A (in estate mark)	83	7 do	sou	315	37 bid
21	Do	85	2 do	bro or pek dust	140	30
22	Do	86	1 do	bro mix	40	32
23	Nahalma	87	23 hf-ch	bro pek	1265	58 bid
24	Do	89	23 ch	pekoe hooped	2300	43 bid
25	Do	91	3 hf-ch	congou	180	33 bid
26	Do	92	1 do	dust	75	27
27	Woodend	93	11 ch	bro pek	1155	55 bid
28	Do	95	16 do	pekoe	1600	42 bid
29	Do	97	8 do	pek sou	760	38
30	Hakura-galla	99	8 do	bro pek	800	59
31	Do	1	20 do	pekoe	1800	46
32	Do	3	6 do	pek sou	540	37 bid
33	A G C	5	1 hf-ch	fane	60	29
34	Do	6	11 do	pek dutt	825	26
38	Agra Oya	13	2 ch			
			8 hf-ch	bro pek	600	58 bid
39	Do	15	2 ch	pekoe	200	48
40	Do	16	8 do	do No. 2	800	41 bid
41	Dunottar	18	39 hf-ch	or pek	1950	61 bid
42	Do	20	13 ch	bro pek	1300	49 bid
43	Do	22	5 do			
			1 hf-ch	pekoe	505	43 bid
44	Do	24	1 ch	pek sou	96	52 bid
45	Do	25	1 do	sou	82	29 bid
46	Do	26	1 do	dust	136	26
47	Do	27	1 hf-ch	red leaf	35	28
48	Pambagama	28	23 do	bro pek	1389	60
49	Do	30	44 ch	pekoe	4400	40 bid
50	Do	32	17 do	pek sou	1615	36 bid
51	D	34	36 ch	or pek	3600	39 bid
52	D	36	8 do	bro pek	800	43 bid
53	D	38	15 do	pekoe	1500	38 bid

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 8th Oct., the undermentioned lots of Tea (42,215 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	F H	75	6 hf-ch	bro or pek bulked	240	58
2	Do	76	13 do	bro pek bulked	520	50
3	Do	77	5 do	pekoe bulked	200	45
4	Do.	78	4 do	pek sou bulked and hooped	200	39
5	Do	79	3 do	sou hooped	270	35
6	A D A	80	14 ch	bro pek hooped	1400	53
7	Do	81	15 do	pekoe	1200	40
8	Do	82	13 do	pek sou hooped	975	36
9	Hattanwella	83	12 hf-ch	bro or pek	600	53 bid
10	Do	84	40 do	pekoe	2000	41 bid
11	Do	85	6 do	pek sou	300	36
12	Do	86	2 do	bro mix	80	38
13	Do	87	2 do	dust	110	28
14	Marymount	88	6 hf-ch	unas	300	37
15	W A P (in estate mark)	89	9 ch	pekoe	900	43

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
16	Blairavon	90	18 ch	bro pek	1800	67
17	Do	91	19 do	pekoe	1710	53
18	Do	92	13 do	pek sou	1170	42
19	Do	93	1 do	bro mix	120	33
20	Do	94	1 do	dust	120	27
21	H	95	6 hf-ch	pekoe	270	37 bid
22	H	96	7 do	pek sou	315	35
23	A H (in estate mark	97	3 ch	or pek	330	50 bid
24	Do	98	4 do	pekoe hooped	400	38 bid
25	G W	99	3 do	bro mix	150	30
26	Roseneath	100	23 hf-ch	bro pek	1390	56
27	Do	1	13 ch	pekoe	1300	45
28	Do	2	14 do	pek sou	1400	40
29	Allakolla	3	24 hf-ch	bro pek	1560	58
30	Do	4	29 ch	pekoe hooped	3045	45 bid
31	Do	5	17 do	pek sou hooped	1700	40
32	Do	6	2 hf-ch	bro tea hooped	160	29
33	Do	7	1 do	dust hooped	100	25
34	K	8	5 do	or pek	300	48 bid
35	K	9	2 ch	pekoe bulked and hooped	200	44
36	K	10	4 do	pek sou bulked and hooped	360	37 bid
37	Goonambill	11	11 hf-ch	bro pek	715	58
38	Do	12	12 do	pekoe	720	49
39	Do	13	9 do	pek sou	495	43
40	Do	14	1 do	dust	62	25
41	Do	15	2 do	fans	118	32
48	G A	22	5 hf-ch	finest woolong	250	39
49	T N E	23	6 do	unas	300	withd'n.
50	G	24	5 ch	bro mix	462	29
51	G M B	25	5 hf-ch	bro pek	300	65
52	Do	26	16 do	pekoe	960	54
53	Do	27	3 do	bro mix	180	37
54	Do	28	1 do	red leaf	60	30
55	P	29	14 ch	bro mix	100	38
56	Salawe	30	8 hf-ch	bro pek	416	76
57	Do	31	11 do	pekoe	550	50
58	Do	32	27 do	pek sou	1350	42
59	Do	33	17 do	unas	850	40
60	Do	34	do	mixed	216	33 bid
61	Do	35	2 do	dust	136	27
62	Friedland	36	2 do	pekoe	76	44 bid
63	Do	37	10 do	sou	480	35 bid
64	Do	38	2 do	red leaf	70	30
65	Do	39	2 do	dust	129	27
66	Ravenscraig	40	24 hf-ch	pekoe	1200	46 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 8th Oct., the undermentioned lots of Tea (78,217 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Horaua	552	4 hf-ch	bro pek	178	56
2	Do	554	3 do	pekoe	138	43
3	Do	556	7 do	pek sou	280	39
4	Do	558	2 do	sou	76	36
5	B	560	1 do	bro pek	45	39
6	B	562	4 ch	pekoe	180	38
7	B	564	1 do	pek sou	55	28
8	Galkadua	566	18 hf-ch	bro pek	900	58 bid
9	Do	568	22 do	pekoe	1100	41
10	Do	570	20 do	pekoe	1000	46
11	L	572	10 hf-ch	bro pek	460	57
12	L	574	8 do	pekoe	352	46
13	L	576	16 do	pek sou	704	40
14	L	578	2 do	sou	86	34
15	L	580	2 do	pek dust	108	27
16	L	582	1 do	red leaf	45	31
17	H E P (in estate mark)	584	41 hf-ch	bro pek	2255	76
18	Do	586	20 do	pekoe No. 1	1000	61
19	Do	588	23 do	do „ 2	1150	54
20	Do	590	52 do	pek sou	2600	47
21	Do	592	3 do	dust	240	28
22	Vicarton	594	4 ch	pek sou hooped	340	39
23	Do	596	1 box	unas	19	37
24	Do	598	1 hf-ch	red leaf	35	32
25	Do	600	1 ch	dust hooped	70	26
26	Glendon	2	9 do	pek sou bulked	540	37
27	Do	4	1 do	bro tea	75	73
28	Easdale	6	15 do	bro pek	1500	63
29	Do	8	13 do	pekoe	1040	45
30	Do	10	13 do	pek sou	1040	41
31	Yataderia	12	19 ch	bro pek	2033	54
32	Do	14	16 do	bro pek	1712	54
33	Do	16	33 do	pekoe	3069	41 bid
34	Do	18	13 do	pek sou	1144	38
35	Dehiowita	20	13 ch	bro pek	1365	58
36	Do	22	25 do	pekoe	2375	45
37	Do	24	25 do	pek sou	2250	40

Lot No.	Mark	Box No.	Pkg.	Description	Weight lb.	c.
38	Chalmers	26	10 ch	bro pek	700	68 bid
39	Do	28	38 do	pekoe	2280	50
40	Do	30	10 do	pek sou	600	42
41	Do	32	3 do	pek fan	270	36
42	Do	34	1 do	dust	100	26
43	Do	36	1 do	bro mix	75	32
44	Harangalla	38	43 hf-ch	bro pek	2150	59
45	Do	40	14 ch	pekoe	1330	44
46	N P	42	4 ch	bro mix	320	32
47	Do	44	3 do	do	240	28
48	Portmore	46	35 ch	bro pek	3850	71
49	Do	48	17 do	pekoe	1700	55
50	Do	50	1 do	fans	74	28
51	Monrovia	52	6 hf-ch	bro pek	305	51
52	Do	54	11 do	pekoe	550	40
53	Do	56	3 do	pek sou	300	37
54	Do	58	10 do	pek sou	500	37
55	Do	60	2 do	congou	90	33
56	Do	62	1 do	dust	66	27
57	E K	64	1 do	pekoe	50	38
58	Do	66	2 do	pek sou	100	36
63	D	76	1 ch			
			1 hf-ch	bro pek	131	30
64	D	78	1 do	pekoe	40	34
65	D	80	3 ch			
			1 hf-ch	bro tea	368	25
66	L	82	2 ch	congou	213	26
67	Palmereton	84	6 hf-ch	bro pek	330	71
68	Do	86	8 ch	pekoe	800	55
69	Do	88	7 do	pek sou	700	45
70	Do	90	1 hf-ch	bro mix	44	32
71	H S	92	3 ch	dust	420	26
72	Queensland	94	4 ch	pek fans	300	35
73	Needwood	96	1 ch	pek dust	160	25
74	Amblakande	98	1 do	or pek	110	49 bid
75	Do	100	3 do	pekoe	270	40 bid
76	Do	102	1 do	pek sou	90	35 bid
	(The Yatiyantota Tea Company Limited.)					
77	Polatagama	104	26 hf-ch	bro pek	1300	63
78	Do	106	54 do	pekoe	2700	50
79	Do	108	50 do	pek sou	2500	42
80	Abamalla	110	24 hf-ch	bro mix	1200	35
81	Do	112	4 do	dust	280	25
82	Deaculla	114	10 hf-ch	or pek	600	86
83	Do	116	12 do	pekoe	1200	55
84	Do	118	4 do	pek sou	400	44
85	Do	120	1 hf-ch	dust	70	30
86	B T N	122	1 ch	unas	83	49
87	Do	124	1 do	sou	58	32
88	Do	126	1 do	dust	110	26
89	Broughton	128	1 ch	pek sou	70	47
90	H Agrauvah	130	5 hf-ch	bro pek fans	430	26
91	Do	132	1 do	do do	42	26
92	Do	134	1 box	congou	14	35
93	Berragalla	136	8 ch	dust	1200	26
94	Do	138	3 do	red leaf	345	31
95	R S P	140	6 hf-ch	bro pek	300	60
96	Do	142	13 do	unas	650	41
97	Hunugalla	144	6 ch	sou	480	33 bid
98	G	146	5 do	bro mix	500	36
99	G	148	1 do	red leaf	100	34
100	F (in estate mark	150	12 ch	fan	1140	81 bid
101	Clunes	152	29 hf-ch	pek sou	1450	39
102	Hethersett	154	22 hf-ch	bro or pek	1100	81
103	Do	156	10 ch	pekoe hooped	970	70
104	Do	158	9 do	pek sou hooped	765	58
105	Do	160	1 do	dust hooped	155	29
106	Bandarapolla	162	18 hf-ch	bro or pek	900	57
107	Do	164	40 do	pekoe	2000	46
108	Do	166	20 do	pek sou	900	40
109	B B	168	14 ch	pek sou	1521	35
110	B P T (in estate mark	170	12 ch	pek sou	1057	35

☞ "Not arrived" lots are omitted.

Messrs. E. Benham & Co. put up for sale at the Chamber of Commerce Sale-room today, 15th Oct., the undermentioned lots of Tea (5,305 lb.) which sold as under:—

Lot No	Mark	Box No.	Pkgs.	Description	Weight. lb.	c.
1	Fassefern	12	6 hf-ch	bro pek	360	58 bid
2	Do	14	2 do	pekoe No. 1	100	47 bid
3	Do	16	6 ch	pekoe	600	42 bid
4	Do	18	4 do	pek sou	400	36 bid
5	Do	20	1 hf-ch	dust	80	26
6	Dunside	22	9 ch	bro pek	900	55
7	Do	24	15 do	pekoe	1350	43 bid
8	Do	26	12 do	pek sou	1020	37 bid
9	Do	28	5 do	sou	425	34 bid
10	Do	30	1 hf-ch	dust	70	26

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 15th Oct. the undermentioned lots of Tea (99,282 lb.), which sold as under:—

1	S M	172	1 hf-ch	bro pek	55	56
2	Do	174	2 do	pekoe	100	41
3	Do	176	4 do	pek sou	190	37
4	Do	178	1 do	bro tea	40	26
5	Do	180	2 do	dust	120	34
6	Lethenty	182	4 ch	sou	380	32
7	Do	184	2 do	dust	290	26
8	Kirrimettia L M	186	10 hf-ch	bro pek	500	54
9	Do	188	43 do	pekoe	2350	39
10	Do	190	6 do	pek sou	300	36
11	Do	192	4 do	pek fan	280	27
12	Ismalle	194	3 do	dust	225	26
13	St. Catherine	196	6 ch	bro pek	540	52
14	Do	198	4 do	pekoe	360	42
15	Do	200	4 do	pek sou	360	36
16	Do	202	1 do	pek sou	60	26
17	Becherton	204	6 do	bro pek	600	56
18	Do	206	12 do	pekoe	1140	41
19	Monaco	208	1 do	dust	170	26
20	Dromoland	210	4 hf-ch	red leaf	104	26
21	Do	212	1 do	dust	20	26
22	Do	214	1 do	unas	29	35
23	Hope	216	3 ch	bro mix	378	24
24	Iugiriya	218	7 do	pekoe	700	45
25	S S S	220	1 do	pek sou	110	30
26	Do	222	1 do	red leaf	150	25
27	Clyde	224	8 do	bro pek	800	50 bid
28	Do	226	16 do	pekoe	1600	39 bid
29	Do	228	6 do	pek sou	588	36 bid
33	Freds Ruhe	236	14 do	bro pek	700	55
34	Do	238	17 ch	pekoe	1530	43
35	Do	240	9 do	pek sou	900 }	37
36	Do	242	3 do	pek sou	270 }	
37	W A	244	3 do	bro tea	360	35
38	Do	246	1 hf-ch	dust	100	27
39	C fi (in estate mark	248	11 hf-ch	bro pek	550	78
40	Do	250	21 ch	pekoe	1575	55
41	Do	252	3 do	pek sou	225	43
42	Hayes	254	21 hf-ch	bro or pek	1050	50 bid
43	Do	256	53 do	or pek	2650	43 bid
44	Do	258	46 do	pekoe	2300	39 bid
45	Do	260	60 do	pek sou	3000	41
46	Clunes	262	29 hf-ch	bro pek	1450	53 bid
47	Do	264	58 do	pekoe	2610	40 bid
48	Do	266	20 do	pek sou	1000	38
49	N E	268	18 hf-ch	bro mix	990	31 bid
50	Do	270	5 do	red leaf	275	26 bid
51	Weddegodde	272	2 do	bro pek	90	54
52	Do	274	3 do	pekoe	135	37
53	Do	276	4 do	pek sou	180	35
54	Do	278	1 do	sou	37	30
55	M P	280	1 ch	dust	150	31
56	Do	282	2 do	fans	250	36
57	Do	284	2 do	sou	240	36
58	Mukeloya	286	7 hf-ch	bro pek	385	69
59	Do	288	21 do	pekoe	1050	51
60	Do	290	15 do	pek sou	750	40
61	Do	292	1 do	dust	80	29
62	Middleton	294	32 do	bro pek	2080	65
63	Do	296	14 do	pekoe hooped	1400	52
64	Do	298	1 hf-ch	dust	75	27
65	Bambrakelly	300	1 ch	red leaf	107	55
66	Do	302	1 do	dust	152	26
67	Pausalatenne	304	16 ch	bro pek	1890	55 bid
68	Do	306	16 do	pekoe	1600	45 bid
69	Do	308	16 do	pek sou	1520	42 bid
70	Do	310	3 do	congou	300	33
71	Do	312	5 hf-ch	dust	375	26
72	P D M	314	2 ch 1 hf-ch	sou	225	36
73	Do	316	1 ch	dust	104	26
74	Yataderia	318	14 ch	bro pek	1498	44 bid
75	Do	320	20 do	pekoe	2604	35 bid
76	Do	322	12 do	pek sou	1056	35 bid
77	G L (in estate mark)	324	18 ch	bro pek	2070	57
78	Do	326	10 do	pekoe	1000	42
79	Do	328	7 do	pek sou	665	38
80	Midlothian	330	8 hf-ch	bro pek	400	58
81	Do	332	5 ch	pekoe	550	out
82	Alton	334	14 do	bro pek	1540	66
83	Do	336	14 box	pekoe	280	48
84	Do	338	19 ch	pek sou	1710	48
85	Do	340	10 hf-ch	dust	750	25
86	Columbia	342	19 hf-ch	bro pek	1045	69
87	Do	344	20 do	pekoe	900	57
88	Do	346	3 do	pek sou hooped	135	46
89	Do	348	1 do	dust	75	27
90	N (in estate mark)	350	12 ch	dust	1500	27
91	Radella	352	20 do	bro pek	2000	57 bid
92	Do	354	15 do	pekoe	1200	46
93	Do	356	15 do	pek sou	1200	40
94	Mayfair	358	5 do	bro pek	500	70
95	Do	360	11 do	pekoe	1100	49
96	Do	362	3 do	pek sou	300	38
97	Do	364	1 do	dust	120	27
98	Marlborough	366	6 do	bro pek	600	70
99	Do	368	11 do	pekoe	1100	50
100	Do	370	3 do	pek sou	300	40
101	Do	372	1 do	dust	125	26
102	Do	374	1 do	bro mix	80	30
102½	Fetteressa	376	5 ch	sou	450	36
103	A D	378	14 hf-ch	bro pek sou	726	28
104	Patiagama	380	1 ch	flowery or pek	110	61 bid
105	Do	382	2 do	bro pek No. 1	200	62
106	Do	384	6 do	bro pek	600	62
107	Do	386	34 do	pekoe	3230	44
108	Do	388	1 do	pek sou	95	36
109	P B (in estate mark)	390	22 hf-ch	bro pek	1100	40
110	Do	392	7 do	sou	315	31 bid
111	Do	394	8 ch	dust ooped	560	26
112	K V	396	13 hf-ch	unas	770	35
113	S P S M	398	1 ch	bro pek	106	42
114	Do	400	1 do	pekoe	100	35
115	Do	402	1 do	pek sou	93	33
116	Farnham	404	21 hf-ch	bro pek	1050	59 bid
117	Do	406	12 do	pekoe	945	46
118	Do	408	51 do	pek sou	2295	39
119	Do	410	5 do	bro tea	235	22
120	Debatgama	412	16 do	bro or pek	960	53 bid
121	Do	414	8 ch	pekoe	680	42
122	Do	416	12 do	pek sou	960	37
123	Do	418	1 do	sou	85	35
124	Do	420	1 hf-ch	dust	80	26
125	K	422	15 do	or pek	880	42 bid
126	R	424	4 ch	dust	560	26
127	R	426	1 do	sou	90	31
128	P	428	9 hf-ch	pek	442	37
129	P	430	1 do	fans	35	25
130	K	432	1 do	pekoe	50	33
131	K	434	1 ch	unas ?	103	30
132	K	436	1 do	bro tea	90	26
133	K	438	2 do	red leaf	180	25
134	K	440	1 hf-ch	congou	50	26
135	K	442	3 ch	bro mix	314	24
136	O G A	444	9 do	bro pek	900	62 bid
137	Do	446	9 do	pekoe	855	46 bid
138	Do	448	3 do	pek sou	270	37 bid
139	M	450	12 do	bro tea	1152	27
140	M	452	2 do	sou	172	27
141	S K	454	4 hf-ch	dust	320	26
142	Do	456	1 do	congou	527	36
143	Hunugalla	458	10 ch	sou	1000	35 bid

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 15th Oct., the undermentioned lots of Tea (61,870 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight lb.	c.
1	B (in estate mark)	261	3 hf-ch	congou	180	27
2	Do	262	1 ch	bro mix	84	37
3	Do	263	1 hf-ch	dust	80	37
4	Killaloo	264	3 ch	sou	270	28
5	Do	265	2 do	unas	160	24
6	P T L M	266	2 hf-ch	bro pek	88	51
7	Do	267	3 do	pekoe	120	43
8	Do	268	3 do	pek sou	120	36
9	Do	269	1 do	congou	40	28
10	Do	270	1 do	bro pek fans	50	27
11	H J R	271	5 ch	bro pek	475	44 bid
12	Do	273	8 do	pekoe	640	38 bid
13	Do	275	6 do	pek sou	510	35
14	Do	277	1 do	bro tea	100	24
15	Orange Field P N R	278	13 hf-ch	bro pek	640	49
16	Do	280	50 do	pekoe	2250	33
17	Do	282	5 do	sou	250	31
18	Bittacy	284	12 hf-ch	bro pek	720	71
19	Do	286	23 do	pekoe	1380	53
20	Blackburn	288	7 ch	bro pek	770	47 bid
21	Do	290	4 do	pekoe	380	38 bid
22	Do	11	11 do	pek sou	1100	38
23	Do	13	3 do	sou	300	31
24	Do	14	1 do	dust	145	26
25	Hangranoya	15	12 ch	bro pek	1200	50 bid
26	Do	17	12 do	pekoe	960	43 bid
27	Do	19	15 do	pek sou	1425	38 bid
28	Do	21	1 do	bro tea	100	29
29	Do	22	3 do	dust	450	26

Lot No.	Mark	Box No.	Pkgs.		Description	Weight. lb.	c.
30	Faithlie	23	7	ch	bro pek	700	57 bid
31	Do	25	8	do			
			1	hf-ch	pekoe	790	43 bid
32	Do	27	9	ch	pek sou	810	38
33	Do	29	1	do	dust	140	26
34	Alooor	30	13	hf-ch	bro pek	650	50
35	Do	32	15	do	pekoe	750	39
36	Do	34	3	do	pek sou	150	32
37	Do	35	3	do	fans	160	35
38	Do	37	1	do	unas	60	35
39	Agra Ouvah	38	55	hf-ch	bro pek	2750	53 bid
40	Do	40	35	do	pekoe	1575	43 bid
41	Do	42	10	do	pek sou	450	39
42	Do	44	4	do	bro pek fans	280	26
43	Deeside	45	31	hf-ch	bro pek	1705	65 bid
44	Do	47	29	ch	pekoe	2900	46 bid
45	Do	49	2	do	congou	200	37
46	Do	50	1	hf-ch	dust	80	26
47	Galkande-watte	51	22	ch	bro pek	2200	64 bid
48	Do	53	19	do	pekoe	1710	48
49	E W	55	11	hf-ch	congou	550	36
50	Do	57	8	do	dust	100	25
51	Do	58	2	do	red leaf	560	26
52	Do	59	1	do	fans	55	25
53	Loonagalla	60	8	hf-ch	bro mix	400	36
54	G K W	62	2	ch	bro tea	180	36
55	Do	63	2	do	dust	160	25
56	Maria	64	13	ch	pekoe	1300	47 bid
57	Elston	66	6	hf-ch	dust	420	25
58	Do	67	8	do	congou	400	28
59	Ottery	69	14	ch	bro pek	1400	58 bid
60	Do	71	25	do	pekoe	2250	46
61	Do	73	11	do	pek sou	990	39
62	Do	75	5	do	bro mix	560	27
63	O & S	76	1	ch	bro pek	100	50
64	Do	77	2	do	pekoe	156	39
65	Do	78	1	do	bro mix	136	26
66	L	79	5	do	congou	475	36
67	L	80	5	do	dust	800	24
68	L	81	1	do	red leaf	107	20
69	Marguerita	82	14	hf-ch	bro pek	840	66
70	Do	84	12	do	pekoe	600	63
71	Do	86	18	do	pek sou	990	46
72	Do	88	1	do	sou	45	37
3	Do	89	1	do	dust	75	25
76	Hattangalla	103	12	ch	bro pek	1200	60
77	Do	105	23	do	pekoe	2300	45
78	Do	107	11	do	pek sou	1001	39
79	Do	109	1	hf-ch	pek fan	50	28
83	Albion	115	22	do	bro pek	2090	63 bid
84	Do	117	22	do	pekoe	1870	54
85	Do	119	16	do	pek sou	1360	51
86	Do	121	3	do	sou	255	34
87	Do	122	4	do	dust	336	25

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 19th Sep.:—

Ex "Hector"—Gowerakellie, 1t 109s 3c 107s; 5c 1b 104s 1c 1t 101s 6d 1c 131s; 1c 99s 6d 2o 90s; 2 bags 100s 6d. Niabedda, 2c 110s; 10c 106s 6d; 2c 107s; 7c 1b 104 6d; 1c 1b 133s; 2c 1t 103s; 2 bags 107s; 1 bag 96s.

Ex "Ormuz"—Udapolla, 16 bags 99s 6d; 5 93s, 5 96s 6d; 2 71s; 5 96s; 4 85s 6d; 1 95s; 4 95s.

Ex "Oanfa"—Coneygar, 1b 105s; 1c 1b 103s 6d; 1b 120s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 26th Sept.:—

Ex "Benlawers"—Gonamotava, 1b 109s 6d; 2c 1t 107s 6d; 3c 1b 104s 6d; 1c 128s; 1c 99s 6d; 1o 94s 6d; 1b 99s 6d; 1b 92s; 2 bags 105s 6d.

Ex "Oanfa"—Mahakanda, 1b 1t 104s; 1b 99s 6d; 1 bag 109s; 2 90s 6d. Ragalla, 1c 105s; 5c 104s; 1b 121s; 1 bag 102s; 3 95s. Kahagalla, 1b 107s; 1c 1b 106s 6d; 2c 1t 104s; 1 129; 1 bag 106s. Gracelyn, 1b 103s; 1c 1b 102s; 3 102s; 1t 118s; 1t 95 6d; 1 bag 100s.

Ex "Benlawers"—Dambatenne, 2c 108s; 2c 1b 107s; 6c 1b 105s; 2c 1t 103s 6d; 1c 135s; 1b 98s 6d; 2 bags 116s.

Ex "Oanfa"—Thotulagalla, 1c 113s; 5c 107s; 2c 104s 6d; 1c 139s. Ampittiakande, 1c 1b 105s 6d; 1b 98s; 1b 140s. Ouvah GA, 5c 104s 6d; 2c 1t 102s; 1c 99s; 1b 138s; 1c 130s; 1c 99s; 2 bags 107s.

Ex "Goorkha"—Sirigalla, 14 bags 99s; 5 96s 6d; 4 93s; 1 86s; 2 89s; 4 67s; 3 70s 6d.

Ex "Rohilla"—Venture, 37 bags 95s.

Ex "Ballaarat"—J. J. Vanderspar & Co., Colombo, 30 bags 93s.

Ex "Ormuz"—Lunugalla, 1c 1t 99s. Craig, 1b 107s; 2c 1b 105s 6d; 3c 104s 6d; 1b 110s.

Ex "Hector"—Kelburne, 1t 107s; 5c 106s; 3c 102s 6d; c 99s 6d; 1c 139s.

Ex "Oanfa"—Rappahannock, 1c 105s; 1t 129s; 1b 110s.

Ex "Rewa"—Uvakellie, 1t 108s; 1b 99s; 1b 129s.

Ex "City of Oxford"—Mahauva, 1t 109s; 1c 103s; 1b 101s.

CEYLON CINCHONA SALES IN LONDON

(From Wilson, Smithett & Co.'s Circular.)

MINCING LANE, Sept. 26th, 1890.

Mark	Natural Stem	Renewed	Root
Brechin	2¼d to 2½d	3¾d to 4d	...
E G in diamond	2d to 3½d	4d to 6d	...
Glenugie	3d	...	...
Doomoo	2d	2½d	...
Delrey	2½d to 3d	...	...
Holbrook	2½d	4d	...
Bellongalla	1¾d to 2d	2½d	...
BN in dia. hybrid	2¼d to 3d	...	...
Mattakelle "	2¾d to 3d	4¾d to 5½d	4½d to 6d
Mahakanda	2¾d	4½d	...
Forest Hill	4d	5d	...
Amaoadowa, hybrid	2¼d	...	...
Leangawella	2¾d to 3d	...	...
C H de S	3d	...	4½d
Doonhioda	2d to 3½d	6½d to 7d	...
TNJ, Corfu	2½d	2d	...
OFFICINALIS.			
Holbrook	3½d	5½d	...
Bellongalla, ledger	4½d	3¼d to 3½d	...
B N in diamood	3d to 3½d	3½d to 4d	...
Mattakelle	4d to 4½d	9d	...
" ledger	4d to 10d	6½d	...
Forest Hill "	4½d	6½d	...
G H L H & Co. "	6½d to 8d	...	...
C H de S	5d	7d	...
Rangalla	2d	...	...

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Sept. 26th, 1890.

Ex "Oroya"—Aloowihare, 35 bags 100s; 2 71s; 2 74s 6d.

Ex "Ormuz"—Sirigalla, 32 bags 96s 6d; 3 76s.

Ex "Oanfa"—Kumaradola, 42 bags 92s 6d; 10 66s 6d; 2 56s. Bulatwatte, 17 bags 100s 5 75s 6d; 1 25s.

Ex "Parramatta"—Maousava, 13 bags 100s; 4 90s; 7 51s; 2 65s; 3 91s. Victoria, 9 bags 71s 6d; 1 49s; 1 35s. Glenalpine, 14 bags 96s; 1 74s; 1 66s.

Ex "Oanfa"—Wariapola, 67 bags 100s 6d; 25 80s 6d; 8 57s; 1 47s; 2 71s; 1 55s; 1 45s. Mousrakellie, 20 bags 88s 6d; 1 49s; 1 56s.

Ex "Ormuz"—Anniewatte, 13 bags 96; 11 81s 6d; 1 51s; 1 69s Berelewelle, 19 bags 100s; 2 83s; 2 49s; 1 79s. Udapolla 4 bags 92s; 8 97s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Sept. 19th 1890.

Ex "Hector"—Elkadua, 1 case 1s 7d; 2 1s 8d; 1 1s 2d 1 1s 6d

Ex "Ormuz"—Ellengowan, 3 cases 1s 4d; 2 1s 2d; 3 1s 3d; 1 1s 4d; 1 1s 7d

Ex "Port Caroline"—Malaha Tarifa, 2 cases 2s 1d; 1 case 2s; 2 1s 5d; 1 1s 4d; 1 1s 7d.

TEA, COFFEE, CINCHONA, COCOA, AND CARDAMOM SALES.

No. 23.] Colombo, November 4, 1890. { Price:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today 15th Oct., the undermentioned lots of Tea (49,817 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Harrow	8	6 hf-ch	bro pek	350	49 bid
2	Do	10	7 do	pekoe	370	43
3	Do	12	1 do	bro tea	67	25
4	Torrington	13	5 hf-ch	bro or pek	300	60 bid
5	Do	15	11 ch	bro pek	1210	62
6	Do	17	14 do	pekoe	1400	47
7	Do	19	14 do	pek sou	1260	41
8	Do	21	2 hf-ch	dust	172	26
9	Ettapolla	22	13 hf-ch	bro pek	650	49 bid
10	Do	24	15 do	pekoe	750	40
11	Relugas	26	33 do	bro pek	1815	56 bid
12	Do	28	18 ch	pekoe	1980	46
13	Do	30	11 do	pek sou	1100	38 bid
14	Horagoda	32	7 hf-ch	bro pek	350	48 bid
15	Do	34	16 do	pekoe	720	40 bid
16	Do	36	7 do	pek sou	315	35 bid
17	Nahalma	38	49 do	bro pek	2699	50 bid
18	Do	40	23 ch	pekoe hooped	2300	39 bid
19	A A	42	30 ch	pekoe	3000	44 bid
20	Dumbarton	44	8 ch	bro or pek	800	46 bid
21	Do	46	35 do	bro pek	3500	46 bid
22	Do	48	16 do	pekoe	1600	40 bid
23	Engurrakande	50	12 hf-ch	bro or pk hooped	480	58 bid
24	Do	52	20 ch	bro pek hooped	1800	55 bid
25	Do	54	44 hf-ch	pekoe	2060	41 bid
26	Do	56	30 do	pek sou	1440	37 bid
27	Do	58	3 ch	bro pek sou	270	29 bid
28	Agra Oya	59	2 ch 8 hf-ch	bro pek	600	47 bid
29	Do	61	8 ch	pekoe	800	38 bid
30	Willesden	63	22 ch	bro pek	2200	44
31	Do	65	44 do	pekoe	4400	38 bid
32	M A Y	67	32 hf-ch	pekoe	1440	34 bid
33	Do	69	6 case cont. 1 lb. packed	pekoe	480	out
34	Do	70	2 ch	pekoe	200	40 bid
35	Bogahagoda-watte	71	3 hf-ch	bro pek	187	45 bid
36	Do	72	6 do	pekoe	300	37 bid
37	Do	74	14 do	pek sou	840	35
38	Do	76	2 do	fans	130	27
39	Do	77	2 do	dust	137	26
44	Deckmuk-lana	84	9 do	bro pek	450	out
45	H W D	86	2 do	bro mix	90	29
46	Do	87	1 do	sou	45	29
47	Do	88	1 do	dust	65	26
48	I O	89	18 ch	sou	1620	35 bid

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 15th Oct., the undermentioned lots of Tea (70,723 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Kuruwitte	41	9 hf-ch	bro pek	468	63
2	Do	42	8 do	pekoe	400	45
3	Do	43	12 do	pek sou	552	40
4	Do	44	3 do	sou	135	37
5	Do	45	2 do	bro tea	112	31
6	Do	46	1 do	dust	73	23
7	Do	47	1 do	congou	47	31
8	K D G N A	48	1 hf-ch	bro pek	53	66
9	Do	49	1 do	pekoe	50	46
10	Do	50	1 do	pek sou	50	42
11	Do	51	10 do	unas	500	45
12	Do	52	1 do	unas No. 2	50	40
13	Do	53	1 do	bro tea	50	33
14	Do	54	1 do	bro mix	50	35
15	Do	55	1 do	dust	56	27
16	Ederapolla	56	41 do	bro pek	2255	56 bid
17	Do	57	27 ch	pekoe hooped	2700	42 bid
18	Do	58	10 do	pek sou hooped	1000	38 bid
19	Do	59	1 do	sou hooped	100	31 bid
20	Morningside	60	10 hf-ch	bro pek	500	58
21	Do	61	8 do	pekoe	395	41 bid
22	Morningside	62	15 hf-ch	pekoe	750	41 bid
23	Do	63	7 do	pek sou	350	38
24	Do	64	2 do	red leaf	100	26
25	Do	65	1 do	dust	50	25
26	Killin	66	2 ch	bro pek	200	49 bid
27	Do	67	3 do	pekoe	285	42
28	Do	68	2 do	pek sou	180	39
29	Do	69	1 do	bro tea	95	28
30	K S P C (in estate mark)	70	2 ch	bro pek No. 1	200	55
31	Do	71	7 do	do „ 2	665	43 bid
32	Do	72	2 do	pekoe	160	41 bid
33	Do	73	4 do	pek sou	320	38
34	Do	74	2 do	bro tea	200	28
35	H G A	75	1 do	bro mix	116	27
36	Do	76	2 do	dust	300	25
37	Do	77	1 do	bro tea	116	25
38	Glassel	78	13 do	bro pek	1300	54 bid
39	Do	79	17 do	pekoe	1530	44 bid
40	Do	80	17 do	pek sou	1445	37 bid
41	Do	81	1 hf-ch	congou	50	30
42	Liskilene	82	12 ch	bro pek	1260	55
43	Do	83	16 do	pekoe	1600	43
44	Do	84	12 do	pek sou	1020	37 bid
45	Do	85	1 do	pek dust	80	27
46	Do	86	1 hf-ch	fans	40	29 bid
47	Stockholm	87	12 ch	bro pek	1200	65
48	Do	88	18 do	pek sou	1620	45
49	Do	89	1 do	fans	140	31
50	A S C	90	2 hf-ch	unas	120	34
51	Do	91	4 do	red leaf	190	28
52	Do	92	2 do	fans	108	30
53	Do	93	1 do	dust	55	26
54	Depedene	94	3 hf-ch	bro pek	150	68
55	Do	95	6 do	pekoe	300	50 bid
56	Do	96	9 do	pek sou	450	41
57	H D	97	9 hf-ch	bro tea	450	32
58	Do	98	2 do	bro mix	100	27 bid
59	Do	99	1 do	dust	50	27
60	Lyndhurst	100	7 ch 1 hf-ch	bro pek	755	56
61	Do	1	10 ch	pekoe	912	40
62	Do	2	13 do	pek sou	1175	36 bid
63	Mapitiama	3	2 ch 1 hf-ch	bro pek	263	55
64	Do	4	3 ch	pekoe	285	40
65	Do	5	4 do 1 hf-ch	pek sou	410	36
6	Do	6	1 do	dust	56	25
67	Wereagalla	7	16 ch	bro pek	160	60
68	Do	8	18 do	pekoe	1530	45 bid
69	Do	9	17 do	pek sou	1300	39
70	Do	10	3 hf-ch	bro tea	145	36
71	Do	11	1 do	dust	75	27
72	Do	12	1 do	congou	45	31 bid
73	Burnside	13	15 do	bro pek	900	57
74	Do	14	25 do	pekoe	1250	44
75	Do	15	3 do	pek sou	150	36
76	Do	16	1 do	dust	60	26
77	K	17	5 do 1 box	pekoe	225	41 bid
78	K	18	1 hf-ch 1 box	pek sou	70	35
79	K	19	1 hf-ch	dust	44	25
80	Yarrow	20	8 hf-ch	bro pek	512	60
81	Do	21	14 do	pekoe	810	45 bid
82	St. Andrew's	22	15 hf-ch	or pek	990	68 bid
83	Do	23	13 do	bro pek	845	48 bid
84	Do	24	33 do	pekoe	2112	45 bid
85	B V A	25	18 hf-ch	bro pek	1080	49 bid
86	Do	26	12 hc	pekoe	1200	46 bid
87	Do	27	12 do	pek sou	1320	34 bid
88	Do	28	1 hf-ch	dust	75	26
89	Crurie	29	1 do	bro tea	34	26
90	R X	30	1 ch	bro mix	120	28
91	Do	31	2 do	pek dust	280	27
92	Do	32	1 do	bro tea	120	30
93	Do	33	1 do	dust	140	26
94	Naseby	34	11 hf-ch	bro pek	605	67
95	Do	35	10 do	pekoe	550	53
96	M (in estate mark)	36	5 hf-ch	or pek	275	45 bid
97	Do	37	12 do	pekoe	600	40 bid
98	Do	38	7 do	pek sou	350	37
99	Do	39	3 do	pk dust	240	27
100	Do	140	1 do	congou	50	29

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
101	Aadneveu	141	7 ch	bro pek	700	65
102	Do	142	7 do	pekoe	630	46 bid
103	R	143	2 hf-ch	pek sou	174	24
104	R	144	1 do	sou	110	25
105	R	145	2 do	fans	184	24
106	Hattanwella	146	12 hf-ch	bro or pek	600	51 bid
107	Do	147	40 do	pekoe	2000	40 bid
108	Allakolla	148	29 ch	pekoe	3045	42 bid
116	P M	158	6 ch	red leaf	560	25
117	C C	157	1 do	pekoe	100	30
118	X X	158	5 do 1 hf-ch	bro mix	506	27
119	P	159	6 do	or pek	300	60
120	O O	160	18 ch	sou	1620	35 bid

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 22nd Oct., the undermentioned lots of Tea (49,011 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Kanangama	1	15 ch	bro pek	1575	44
2	Do	3	12 do	pek sou	1080	34
3	Brae	5	14 hf-ch	bro pek	840	53 bid
4	Do	7	33 do	pekoe	1815	44
5	Do	9	4 do	fans	240	37 bid
6	Do	10	3 do	dust	180	24 bid
7	Kotagala	11	8 do	bro or pek	480	60
8	Do	13	20 ch	or pek	1800	50
9	Do	15	8 do	pek sou	720	40
10	Nahalma	17	23 hf-ch	bro pek	1265	53 bid
11	Do	19	22 ch	pekoe	2200	41 bid
12	Do	21	2 hf-ch	congou	126	30 bid
13	Do	22	1 do	dust	75	26
14	A G C	23	2 ch	congou	200	25
15	Do	24	13 hf-ch	dust	925	26
19	Woodend	30	12 ch	bro pek	1260	52
20	Do	32	14 do	pekoe	1400	42
21	Do	34	5 do	pek sou	475	33 bid
22	B U S (in estate mark)	36	11 do	pek sou	1100	36 bid
23	Do	38	4 do	congou	400	31
24	Pambagama	39	26 hf-ch	bro pek	1560	54 bid
25	Do	41	45 ch	pekoe	4500	40 bid
26	Do	43	44 do	do	4400	40 bid
27	Do	45	20 do	pek sou	2000	33 bid
28	Lavant	47	12 do	bro pek	1200	53
29	Do	49	23 do	pekoe	1840	41
30	Do	51	16 do	pek sou	1280	35
31	Do	53	2 do	dust	250	26
32	F (in estate mark)	54	15 do	sou	1200	27 bid
33	Yaha Ella	56	18 hf-ch	bro pek	900	55
34	Do	58	18 do	pekoe	810	40
35	L (in estate mark)	60	1 ch	bro pek sou	80	26
36	Panilla	61	6 do	or pek	600	61 bid
37	H H A	62	37 ch	or pek	3700	45 bid
38	Do	64	10 do	bro pek	1000	40 bid
39	Ettapolla	66	13 hf-ch	bro pek	650	52
40	Horagoda	68	7 do	bro pek	350	45 bid
41	Do	70	16 do	pekoe	720	38 bid
42	Do	72	7 do	pek sou	315	33 bid

Mr. E. John put up for Sale at the Chamber of Commerce Sale-room today, 22nd Oct., the undermentioned lots of Tea (37,803 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Labugama	124	1 hf-ch	congou	40	33
2	Do	125	1 do	red leaf	40	29
3	Do	126	1 do	pek dust	60	27
4	Do	127	2 do	unas	80	35
5	Do	128	4 do	pek fans	180	37
6	Do	129	8 do	sou	320	33
7	D E	131	6 ch	bro mix	492	37
8	Do	132	7 do	dust	581	24
9	Comar	133	1 do	dust	95	25
10	Do	134	3 do	bro mix	285	28
11	Do	135	3 do	pek sou	270	36
12	Do	136	5 do	pekoe	500	41
13	Do	138	4 do	bro pek	400	44 bid
14	Eila	140	8 do	bro pek	800	49 bid
15	Do	142	15 do	pekoe	1200	44
16	Do	144	12 do	pek sou	960	38 bid
17	Do	146	1 do	dust	125	26
18	Abbotsford	147	17 do	bro pek	1700	60 bid
19	Do	149	24 do	pekoe	1920	48 bid
20	Do	151	14 do	pek sou	1120	38 bid
21	F (in estate mark)	153	12 do	fans	1140	25
22	Do	155	11 do	fans	1155	25
23	Ferndale	157	13 do	bro pek	1300	58 bid
24	Do	159	22 do	pekoe	2200	43 bid
25	Madoolteune	161	11 do	bro pek	1210	50 bid
26	Do	163	13 do	pekoe	1300	38 bid
27	Do	165	12 do	pek sou	1140	34 bid
28	Lawrence	167	21 do 1 hf-ch	sou	2035	29 bid
29	Do	169	3 ch	dust	210	25
30	Alliady	170	4 do	bro or pek	520	45 bid
31	Do	172	5 do	pekoe	500	38
32	Do	174	9 do	pek sou	900	35
33	Do	176	2 do	bro mix	260	25
34	Gouravilla	177	35 hf-ch	flowery or pek	1750	65
35	Do	179	21 ch	pekoe	2100	47 bid
36	Do	181	6 do	pek sou	600	40 bid
37	Do	183	2 do	bro mix	140	36
38	Do	184	1 hf-ch	dust	75	27
39	Logan	185	19 do	bro pek	950	51 bid
40	Do	187	18 do	pekoe	810	46 bid
41	Do	189	30 do	pek sou	1350	38 bid
42	Do	191	7 do	sou	315	35
43	Do	193	6 do	dust	360	26
44	Albion	194	25 ch	bro pek	2375	56 bid
45	Do	196	16 do	pekoe	1280	42 bid
46	Cruden	198	6 do	sou	570	33
47	Do	200	1 hf-ch	dust	80	26

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 22nd Oct., the undermentioned lots of Tea (34,617 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Madde	61	3 ch	dust	270	24
2	Do	62	1 hf-ch	red leaf	59	25
3	Do	63	1 do	unas	31	34
4	F F O (in estate mark)	64	14 ch	pekoe	1540	40
5	Do	65	6 hf-ch	pek sou	319	34
6	Do	66	1 ch	unas	100	32
7	N B	67	24 hf-ch	bro mix	1320	32
8	Do	68	21 do	imperial green	1155	27
9	C	69	20 do	bro mix	1100	32
10	Malgolla	70	30 hf-ch	bro pek	1500	55
11	Do	71	16 do	pekoe	800	45
12	Do	72	110 do	pek sou	4950	38 bid
13	Do	73	15 do	bro tea	825	34 bid
14	Do	74	4 do	sou	180	32
15	Do	75	4 do	dust	240	26
16	Do	76	6 do	red leaf	510	26
17	G M B	77	8 do	bro pek	480	63
18	Do	78	22 do	pekoe	1320	56
19	Do	79	2 do	bro mix	130	42
20	Do	80	1 do	red leaf	60	28
21	Do	81	1 do	dust	100	25
22	Allakolla	82	14 do	bro pek	610	52 bid
23	Do	83	19 ch	pekoe	1995	41 bid
24	Do	84	14 do	pek sou	1400	37
25	Chiswick	85	18 do	bro pek	2070	56 bid
26	S W R	86	9 do	bro tea	1022	25
27	N (in estate mark	87	3 do	bro pek	312	48
28	Do	88	7 do	pekoe	656	33
29	Do	89	3 do	pek sou	294	36
30	P (in estate mark	90	1 do	pekoe	114	32
31	Harmony	91	16 hf-ch	bro pek	800	61
32	Do	92	23 ch	pekoe	2310	42
33	Do	93	6 do	pek sou	510	7
34	Do	94	2 hf-ch	pek fans	150	25
35	Do	95	3 do	bro mix	135	32
36	Chertsey	96	2 do	bro pek	100	51 bid
37	Do	97	6 do	pekoe	270	41
38	Do	98	5 do	pek sou	200	38
39	Do	99	2 do	sou	80	34
40	Do	100	4 do	pek fans	180	33

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 22nd Oct., the undermentioned lots of Tea (85,228 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Goomera	460	4 ch	red leaf	400	28
2	Beausijour	462	3 do	bro pek	300	47
3	Do	464	5 do	pekoe	425	38
4	Do	466	4 do	pek son	400	34
5	Do	468	1 hf-ch	dust	70	25
6	F F B	470	3 ch	bro pek	300	43
7	Do	472	1 do 1 hf-ch	pekoe	140	37
8	Do	474	6 do	pek sou	540	35
9	A B C	476	1 do	bro pek	60	41
10	Do	478	1 do 1 ch	pekoe	150	34
11	Do	480	3 do	pek sou	300	32
12	A K	482	4 do	bro tea	400	29
13	Do	484	1 do	congou	100	27
14	Do	486	5 do	red leaf	530	25
15	Do	488	1 do 1 hf-ch	dust	195	25
16	D C	490	7 do	bro pek	350	44 bid
17	Do	492	9 do	pekoe	450	35
18	Do	494	19 do	pek sou	950	35
19	Do	496	4 do	sou	200	32
20	Do	498	3 do	bro tea	150	25
21	Cross (in estate mark)	500	22 ch	bro mix	2200	25
22	Walabandua	502	18 hf-ch	bro pek	1080	49
23	Do	504	28 do	pekoe	1540	39
24	Do	506	15 do	pek sou	750	35
25	S P A	508	24 do	sou	1320	34
26	Do	510	3 do	bro tea	165	25
27	Do	512	1 do	bro mix	50	25
28	Do	514	1 do	pk dust	85	27
29	Do	516	1 do	fans	60	30
30	Do	518	1 do	unas	65	37
37	Shrubs's Hill	532	20 hf-ch	bro pek	1100	55 bid
38	Do	534	14 ch	pekoe	1190	40 bid
39	Do	536	16 do	pek sou	1360	38 bid
40	Do	538	1 do	sou	85	34
41	Do	540	1 do	dust	150	26
42	L R	542	1 do	sou	85	27
43	Do	544	1 do	red leaf	80	25
44	Do	546	1 do	dust	130	25
45	N P	548	2 ch	sou	170	37
46	Do	550	15 do	red leaf	1200	25
47	Do	552	5 do	dust	650	25
48	I G	554	3 do	sou	270	33
49	Do	556	1 do	bro tea	120	28
50	Dromoland	558	1 box	red leaf	16	20
51	Hope	560	1 ch	bro mix	126	22
52	Kirrimettia	562	3 do	red leaf	312	33
53	,,	564	3 do	bro tea	312	37
54	,,	566	2 do	bro mix	208	32
55	Koladenia	568	1 do	bro tea	126	24
57	Monaco	572	1 ch	dust	170	25
58	V O	574	4 do	dust	448	24
59	,,	576	2 do	red leaf	220	25
60	Maskeloya S S	578	12 do	pek sou	1200	37
61	Thornfield	580	17 hf-ch	bro pek	1020	58 bid
62	,,	582	14 ch	pekoe	1400	51
63	,,	584	4 do	pek sou	392	39
64	,,	586	1 hf-ch	pek dust	80	27
65	,,	588	1 do	bro mix	54	30
66	Hatton	590	2 ch	sou	170	30
67	,,	592	1 do	sou	80	30
68	,,	594	1 do	red leaf	80	20
69	,,	596	5 do	dust	650	24
70	Mariawatte	598	27 do	or pek	2565	55
71	,,	600	29 do	pekoe	2610	42 bid
72	,,	2	28 do	pek sou	2520	37
73	L G E	4	3 hf-ch	or pek	180	46
74	,,	6	2 do	pekoe No. 1	110	38
75	,,	8	1 do	dust	90	18
76	Amblakande	10	2 ch	or pek	220	46 bid
77	,,	12	4 do	pekoe	360	35 bid
78	,,	14	1 do	bro mix	120	24
79	,,	16	1 do	pek sou	90	38
80	P B (in estate mark)	18	15 hf-ch	or pek	744	47 bid
81	Craighead	20	38 do	bro or pek	1900	55 bid
82	,,	22	25 ch	pekoe	2250	40 bid
83	,,	24	29 do	pek sou	2465	36
84	,,	26	7 do	sou	595	33
85	Theberton	28	12 ch	bro pek	1200	44
86	,,	30	6 do	pekoe	600	35
87	,,	32	4 do	pek sou	400	34
88	,,	34	1 do	pek dust	100	25
89	Palmerston	36	5 hf-ch	bro pek	275	63
90	,,	38	8 ch	pekoe	800	53
91	,,	40	5 do	pek sou	500	38
92	Hunugalla	42	16 do	sou	1480	withd'n
93	Chesterford	44	18 hf-ch	bro pek	1080	52 bid
94	,,	46	28 do	pekoe	1400	38 bid
	(The Yataderia Tea Company, Limited.)					
95	Polatagama	48	23 hf-ch	bro pek	1150	54 bid
96	,,	50	40 do	pekoe	2000	40 bid
97	,,	52	52 do	pek sou	2340	37
98	W	54	3 do	pek sou	285	26
99	W	56	2 do	sou	142	26
100	W	58	2 do	bro tea	200	20
101	W	60	3 do	pek dust	393	25
102	Galkadua	62	18 do	bro pek	900	48 bid
103	,,	64	24 do	pekoe	1200	36 bid
104	,,	66	18 do	pek sou	900	35
105	C B	68	5 ch	bro mix	500	37
106	,,	70	2 hf-ch	dust	160	25
107	Caledonia	72	4 ch	or pek	400	51
108	,,	74	4 do	pek sou	400	37
109	Bandarapolla	76	22 hf-ch	or pek	1100	56
110	,,	78	64 do	pekoe	3200	41 bid
111	,,	80	47 do	pek sau	2115	37
112	,,	82	1 do	dust	70	25
113	Midlothian	84	8 do	bro pek	400	58
114	,,	86	5 ch	pekoe	550	42 bid
115	L B K	88	7 do	red leaf	700	25
116	Troy	90	3 do	bro tea	300	31
117	,,	92	3 do	pek dust	450	25
118	,,	94	2 do	congou	180	27
119	,,	96	2 do	red leaf	200	23
120	Luccombe	98	36 do	bro or pek	3240	45 bid
121	,,	100	41 do	pekoe	3690	40 bid
122	,,	102	38 do	pek sou	3420	33 bid
123	,,	104	6 do	pek fans	540	bid
124	B L (in estate mark) F	106	1 ch	pekoe	90	35

☞ "Not arrived" lots are omitted.

Mr. E. BENHAM put up for sale at the Chamber of Commerce Sale-room today, 29th Oct. the undermentioned lots of Tea (2,025 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	St. Leys	12	10 ch	bro pek	1050	49 bid
2	Do	14	6 do	pekoe	600	46
3	Do	16	2 do	pek sou	200	39 bid
4	Do	18	1 do	bro mix	120	26 bid
5	A	20	1 hf-ch	red leaf	55	25
6	Vicarton		1 ch	pek sou	85	34
7	Do		1 do	pekoe	80	out
8	Baragalla		2 do	dust	30	25 bid
9	Wangieoya		1 do	pekoe	100	42 bid

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 29th Oct., the undermentioned lots of Tea (29,670 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkg.	Description	Weight lb.	c.
1	D E C (in estate mark)	1	8 hf-ch	red leaf	400	32
2	Do	3	2 do	fans	100	32
3	Do	4	1 do	dust	50	25
4	Glanrhos	5	7 do	bro pek	385	52
5	Do	7	15 do	pekoe	675	42
6	Do	9	6 ch	pek sou	540	36
7	Do	11	1 do	congou	80	33
8	K	12	28 do	bro pek	1540	57
9	K	14	25 do	No. 1 pekoe	1250	45
10	K	16	46 do	pekoe	2070	38 bid
11	K	18	35 do	pek sou	1575	36
12	Brae	20	13 hf-ch	bro pek	780	50 bid
13	Do	22	14 ch	pekoe	1400	40
14	Do	24	4 hf-ch	fans	240	38 bid
15	Do	25	3 do	dust	180	26
16	Relugas	26	20 do	bro pek	1100	60
17	Do	28	10 ch	pekoe	1100	42 bid
18	Do	30	11 do	pek sou	1100	37
19	Y D (in estate mark)	32	12 do	or pek	1080	65 bid
20	Do	34	28 do	pekoe	2380	45 bid
21	Do	36	4 do	bro mix	360	32
22	Do	37	5 do	dust	725	25

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 29th Oct., tbe nnder-mentioned lots of Tea (52,421 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	P	212	2	ch	dust No. 2	380	25
2	Devonford	213	3	hf-ch	pek sou	150	42
3	Do	214	2	ch	bro mix	270	28 bid
4	Do	215	1	hf-ch	pek fans	60	34
5	Ottery	216	13	ch	bro pek	1300	58 bid
6	Do	218	26	do	pekoe	2340	withd'n
7	Do	220	11	do	pek sou	990	withd'n
8	Do	222	2	do	bro mix	260	withd'n
19	Mocha	223	55	hf-ch	bro pek	3025	62 bid
10	Do	225	37	ch	pekoe	3700	56
11	Do	227	21	do	pek sou	1995	46
12	Deeside	229	16	do	bro pek	1600	55 bid
13	Do	231	31	hf-ch	bro pek	1705	62
14	Do	233	24	ch	pekoe	2160	40 bid
15	Do	235	29	do	pekoe	2900	46 bid
16	Do	237	1	do	congou	100	34
17	G O	238	10	hf-ch	dust	700	withd'n
18	Ythanside	239	2	ch	red leaf	160	25
29	Killaloo	240	36	do	unas	2380	22
22	M R	246	2	do	pek fans	200	32
23	Do	247	1	do	dust	85	25
24	Alliaddy	248	4	do	bro or pek	520	45 bid
25	Killaloo	250	62	do	sou	5580	31 bid
26	Labugama	252	5	hf-ch	bro or pek	270	53
27	Do	253	16	do	bro pek	640	61
28	Do	255	21	do	pekoe	840	45
39	Do	257	6	do	pek sou	240	38
30	Do	259	3	do	pek fans	135	37
31	Do	260	1	do	unas	40	39
32	Do	261	1	do	pek dust	50	27
33	Do	262	4	do	sou	160	35
34	Kadienlena	263	41	ch	bro pek	3690	55 bid
35	Do	265	44	do	pekoe	3520	43 bid
37	Albion	269	20	do	bro pek	2100	58 bid
38	Do	271	14	do	pekoe	1316	41 bid
39	Do	273	13	do	pek sou	1170	37 bid
40	Do	275	4	do	dust	340	27

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 3rd Oct. :—

Ex "Orotava"—Elemane, 1b 3c 1t 105s; 4c 102s, 3c 1b 100s; 1t 115s; 1 bag 101s.

Ex "Oanfa"—Thotulagalla, 1c 103s; 3 bags 102s; 1 bag 85s.

Ex "Rewa"—Ragalla, 1c 104s 6d; 3c 103s 6d; 1b 130s; 2 bags 96s. Roebampton, 1c 108s; 6c 1b 106s; 2c 1b 103s; 1c 126s; 1t 98s 6d: 1b 101s; 1b 97s; 1c 97s 6d; 1c 96s; 1c 92s 6d; 2 bags 103s.

Ex "Benlawers"—Gonamotava, 1 bag 96s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 10th Oct. :—

Ex "Orotava"—Gonamotava, 1c 105s; 4c 104s; 1c 99s 6d; 1 bag 104s.

Ex "Cyclops"—Hillside, 1c 103s; 5c 102s 6d; 1b 84s; 2 bags 102s.

Ex "Rewa"—Mahapahagalla, 1c 107s; 4c 1t 105s 6d; 2c 101s 6d; 1b 119s; 3 bags 95s 6ds; 1 bag 101s. Need-wood, 1b 109s; 1c 1b 107s; 1c 104s; 1b 127s.

Ex "Oanfa"—CGR T, 1 bag 92s.

Ex "Cyclops"—Ury, 1c 1b 108s 6d; 3c 105s; 1c 101s; 1b 123s; 1b 95s; 1 bag 105s.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)

MINCING LANE, Oct. 10th, 1890.

Mark	Natural Stem	Renewed	Root
ST & LC in dia.	3d	4½d	...
Gigranelle	...	...	3½d to 4d
Langdale	2½d to 3d	5d	...
St. Clair	3d	...	...
Badullawatte	3d to 3½d	5½d	...
Chetnole	1¾d to 2d	...	2d
Yapame	...	5½d to 6d	...
E, L in diamond	2½d	3½d	...
RDE, S do	3½d	5½d	4½d
RCW, B do	2½d	4½d to 6d	5d
Verelapatna	2½d to 3d	6½d	...
Agrakande	2d to 2½d	3½d	...
Tulloes	2½d	...	2½d to 3d
Mahapahagalla	2½d to 4½d	3½d to 6d	...
Keeakelle	2½d	3½d to 4d	4d
W S F, D in diamond	...	4½d	...
S in diamond	2½d	3d	3d
Fernlands	1¾d to 2d	3d	2½d
Dunsinane, hyd.	3½d to 4d	5½d to 6d	5d
Tillicoultry	3¾d	4½d	...
Ladbroke	2½d	3½d to 4d	...
Queensberry	3d to 3½d	...	...
Cashieban	3d	5d	...
Mortlske	3½d	4d to 6½d	...
Maha Uva	3d	4½d	...
C H L, A in dia.	3d	4d	3½d
FRS, OO ,,	2d to 3d	3½d to 4½d	...
CPC, G ,,	2½d to 4d	4d to 5d	...
TJEJ, D ,,	3½d	7d	...
W W W in triangle	...	3½d to 4d	2½d
Broughton, hyd.	2d to 2½d	...	...
GS, R in diamond	3½d to 4d	...	...
Scarborough	2½d to 3d	6½d	...
Ragalla	3d	...	6d to 6½d
Forest Hill	4d	5d	...
OFFICINALIS.			
Doomba	2½d	3½d	3½d
Langdale	3½d	...	..
St. Clair	2½d to 3d	3d	...
Badullawatte, hybrid	2½d to 3d	...	...
Tulloes	3d	7½d	5d to 5½d
Keeakelle	3d to 3½d	8½d to 9d	...
Tillicoultry	3d	6d	...
Mortlake, ledger	3½d to 5d	...	...
CHL, A in dia.	3d to 4d	5d	6d
Diyagama	3d to 3½d	5d	...
Gracelyn	4d	8½d to 1s	9d
MCC, E in diamond	3¾d	...	...
BOL	2¾d	...	...
Ragalla	2½d	5½d to 6d	...

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Oct. 3rd, 1890.

Ex "Oroya"—North Matale, 98 bags 98s; 8 63s.

Ex "Oanfa"—Manatelle, 9 bags 95s; 1 56s; 20 105s; 2 57s 6d; 1 54s; 4 32s; 20 102s 6d; 3 75s.

Ex "Parramatta"—Mahaberia (OBEC), 20 bags 109s; 20 96s 6d; 6 61s.

Ex "Port Caroline"—Kondesalle (OBEC), 3 bags 94s; 1 77s; 1 45s; 7 94s; 2 77s; 4 53s; 1 94s; 1 77s; 2 94s; 1 53s.

Ex "Strathdee"—Mahaberia (OBEC), 19 bags 110s 19 96s 6d; 6 60s.

MINCING LANE, Oct. 10th.

Ex "Oanfa"—Elmshurst, 9 bags 105s 6d; 1 70s; 1 44s; 11 79s; 1 44s.

Ex "Orotava"—Glenalpbin, 14 bags 97s 6d; 2 91s.

Ex "Oanfa"—KK, 1 bag 37s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Oct. 3rd, 1890.

Ex "Benlawers"—Delpotonoya, 3 cases 2s 7d; 2 1s 9d; 4 1s 10s; 2 1s 4d.

Ex "Ningchow"—Loonagalla, 4 cases 1s 2d.

Ex "Orient"—Knuckles MAL, 1 case 1s 8d.

Ex "Port Caroline"—Warragalla, 2 cases 2s 2d; 1 1s 10d, 4 1s 8d; 2 1s 1d.

Ex "Verax"—Lebanon Group, 2 cases 1s 5d; 2 1s 3d; 1 10½d; 2 9½d.

Ex "Oanfa"—(Great Valley), 4 cases 1s 6d; 4 1s 7d; 1 6d.

Ex "Arabia"—Wewelmadde, 2 cases 1s 11d; 1 10½d.

Ex "Kaiser-i-Hind"—Vicarton, 10 cases 1s 8d.

Ex "Tiverton"—(M&C N), 2 cases 1s 5d; 5 1s 4d.

No. 24.] COLOMBO, NOVEMBER 25, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 29th Oct., the undermentioned lots of Tea (17,414 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Yabalatenne	1	10 hf-ch	bro pek	600	55
2	Do	2	4 ch	pekoe	360	39
3	Do	3	11 do	pek sou	990	36
4	B F	4	2 do	pek fans	220	34
5	Do	5	1 hf-ch	dust	75	25
6	R X	6	1 ch	bro mix	120	34
7	Do	7	2 do	bro tea	240	34
8	Do	8	2 do	pek dust	280	27
9	Do	9	1 do	dust	140	30
10	E C	10	2 hf-ch	dust	140	25
11	D G A	11	2 do	fans	120	34
12	Do	12	3 do	bro mix	165	34
13	Do	13	3 do	dust	225	25
19	Dalguise	19	12 ch	bro pek	1200	59
20	Do	20	24 do	pekoe	2400	42
21	Do	21	6 do	pek sou	600	40
22	Do	22	1 do	bro mix	70	34
23	Do	23	1 do	dust	150	28
24	C A (in estate mark)	24	2 hf-ch	unas	104	43
25	Do	25	2 do	bro mix	120	37
26	Do	26	1 do	dust	69	27
27	Denmark Hill	27	5 ch	bro or pek	550	79
28	Do	28	5 do	pekoe	485	73
29	Do	29	4 do	pek sou	340	61
30	W M S	30	2 do	bro or pek	200	44
31	Do	31	7 do	bro pek	665	50
32	Do	32	2 do	pekoe	160	42
33	X	33	5 pkg	pekoe	200	40
34	J O H	34	3 ch	bro tea	330	25
35	Do	35	1 do	congou	75	33
36	A K	36	19 do	pekoe	1995	40 bid

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 29th Oct., the undermentioned lots of Tea (60,002 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	L P G	108	4 ch	red leaf	400	28
2	Do	110	2 do	congou	200	28
3	Bramley	112	6 bf-ch	pekoe	390	38
4	Do	114	1 do	red leaf	53	31
5	Do	116	2 ch	dust	200	26
6	Riseland	118	2 do	bro pek	200	46
7	Do	120	9 do	pekoe	810	36
8	Do	122	1 do	bro pek sou	90	30
9	Do	124	10 box	pekoe	100	39
10	D C	126	4 hf-ch	bro pek	200	46
11	Do	128	4 do	pekoe	200	38
12	Do	130	8 do	pek sou	400	33
13	Do	132	2 do	bro tea	110	26
14	D D (in estate mark)	134	4 cb	bro pek	400	54
15	Do	136	3 do	pekoe	300	43
16	Do	138	8 do	pek sou	800	37
17	Daphne	140	4 do	bro pek	400	54
18	Do	142	4 do	pekoe	400	42
19	Do	144	10 do	pek sou	1000	37
20	Kottiagalla	146	3 do	bro pek	300	43
21	Do	148	10 do	pekoe	1000	36
22	Do	150	4 do	pek sou	400	30
23	Do	152	1 do	congou	100	29
24	Do	154	1 do	dust	120	25
25	Do	156	2 do	red leaf	133	26
26	Tonacombe Uva	158	5 do	bro pek	550	53
27	Do	160	11 do	pekoe	1045	47
28	Do	162	12 do	pek sou	1080	39
29	Do	164	2 do	sou	180	36
30	Do	166	5 do	dust	400	25
31	Peurhos	168	4 box	bro or pek	80	out
32	Do	170	11 hf-ch	bro pek	715	74
33	Do	172	24 do	pekoe	1440	51
34	Do	174	24 do	pek sou	1320	41
35	Do	176	3 ch	dust	225	29
36	Penrhos	178	1 bf-ch	congou	50	36
37	Do	180	3 do	pek fan	195	38
38	Court Lodge	182	12 do	bro pek	684	78
39	Do	184	13 do	pekoe	611	70
40	Do	186	15 do	pek sou	690	59
41	Do	188	1 do	sou	141	45
42	Do	190	1 ch	dust	126	28
43	Mausakellie	192	33 hf-ch	bro pek	1980	66
44	Do	194	29 ch	pekoe	2900	44 bid
45	Do	196	1 hf-ch	dust	80	24
46	Do	198	1 do	congou	60	30
47	Mahatenne Uva	200	4 do	or pek	240	52 bid
48	Do	202	9 do	pekoe	540	41 bid
49	Halpatenne	204	3 ch	bro pek	330	45 bid
50	Do	206	4 do	pekoe	400	40
51	Do	208	4 do	pek sou	400	36
52	Do	210	4 do	sou	400	36
53	Do	212	3 do	unas	290	37
54	Do	214	1 do	dust	130	20
55	Alton	216	1 bf-ch	pekoe in 1 lb packets	40	45
56	Do	218	3 do	pek sou in 1 lb packets	120	42
57	Penshurst, Travancore	220	14 do	bro pek	910	60 bid
58	Do	222	15 do	pekoe	750	49 bid
59	Do	224	31 do	pek sou	2790	40 bid
	(The Talgaswela Tea Co., Limited.)					
60	Talgaswela	226	20 ch	bro pek	2000	49
61	Do	228	14 do	pekoe	925	37
62	Do	230	8 do	pek sou	720	36
63	Do	232	2 do	congou	180	33
64	L (in estate mark)	234	1 hf-ch	or pek	30	40
65	Do	236	1 do	pek sou	33	37
66	Do	238	1 do	dust	43	25
67	Middleton	240	21 do	bro pek	1365	57
68	Do	242	10 ch	pekoe	1[illegible]00	46
69	Rambodde	244	19 hf-ch	bro pek	1045	58
70	Do	246	11 do	pekoe	550	46
71	Do	248	7 do	pek sou	350	39
72	Do	250	2 do	congou	100	35
73	Do	252	1 do	dust	65	26
74	P D M (in estate marks)	254	2 ch	unas	180	41
75	Do	256	1 do	congou	80	34
76	Do	258	1 hf-ch	dust	75	24
77	Dessford	260	9 do	bro or pek	540	37
78	Do	262	16 ch	bro pek	1792	44 bid
79	Do	264	24 do	pekoe	2400	36 bid
80	Do	266	13 do	pek sou	1430	37 bid
81	Do	268	5 bf-ch	dust	400	25
82	D (R in estate mark) L	270	4 do	unas	200	32
	(The Yatadoria Tea Co., Limited.)					
83	Yataderia	272	14 ch	bro pek	1498	45
84	Do	274	28 do	pekoe	2604	37 bid
85	Do	276	12 do	pek sou	1056	36
86	Do	278	11 do	bro pek	1177	45 bid
87	Do	280	22 do	pekoe	2046	33 bid
88	Do	282	11 do	pek sou	968	35 bid
89	Do	284	5 do	bro tea	470	30
90	K	286	1 do	pek sou	100	36
91	H	288	1 bf-ch	bro pek	40	40
92	H	290	2 ch	bro pek	189	35
93	H	292	1 do 1 hf-ch	pek fans	158	32
94	H	294	3 do	dust	210	24
95	H	296	1 do	bro tea	54	24
96	H	298	1 ch	unas	70	28
97	T C O	300	2 do	pek sou	204	34
98	Warwick	302	1 hf-ch	congou	50	40
99	Ingiriya	304	5 ch	pekoe	500	46
100	Do	306	1 hf-ch	pek dust	62	27
101	Do	308	1 do	pek sou	44	37
102	D C	310	7 do	bro pek	350	41 bid
103	Do	312	9 do	pekoe	450	40
104	C T O	314	1 do	unas	81	30
105	Do	316	4 do	sou	344	30
106	R S P	318	1 do	unas	50	3
107	Horagaskelle	320	3 do	bro pek	195	55
108	Do	322	6 do	pekoe	336	44
109	Do	324	12 do	pek sou	696	39
110	Do	326	1 do	congou	51	32
111	Do	328	2 do	bro mix	152	30

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room, today, 5th Nov., the undermentioned lots of Tea (32,125 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	Star (in estate mark)	39	16	ch	bro pek	2080	36 bid
2	Do	41	13	do	or pek	1430	34 bid
3	Do	43	39	do	pek sou	3900	34
4	Do	47	21	do	bro mix	3150	29
5	Agra Oya	49	12	do	bro pek	1200	52 bid
6	Do	51	5	do	pekoe	500	42 bid
7	Do	53	15	do	pekoe No. 2	1500	38
8	Do	55	1	do	bro mix	100	26
9	Do	56	1	do	dust	100	27
10	M A Y (in estate mark)	57	36	do	or pek	3600	42 bid
11	Do	59	8	do	bro pek	800	36 bid
12	Woodend	61	16	do	bro pek	1680	47 bid
13	Do	63	16	do	pekoe	1600	39 bid
14	Do	65	9	do	pek sou	855	35
15	Do	66	1	do	congou	80	30
16	Do	67	1	do	dust	135	26
17	W Z (in estate mark)	68	5	hf-ch	bro pek	300	52 bid
18	Do	70	12	do	pekoe	644	41 bid
19	Do	72	9	do	pek sou	442	37 bid
20	Nahalma	74	49	do	bro pek	2695	56
21	Do	76	44	ch	pekoe	4400	41 bid
22	Do	78	1	hf-ch	congou	88	32
23	Do	79	1	do	dust	75	26
24	P O	80	4	do	bro pek	230	51 bid
25	Do	81	2	do	pekoe	94	41 bid
26	Do	82	13	do	pek sou	716	37
27	Do	84	2	do	unas	92	40
28	Do	85	1	do	red leaf	45	29
29	Do	86	1	do	dust	69	26

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 5th Nov., the undermentioned lots of Tea (42,628 lb.), which sold as under :—

Lot No.	Mark	Box No	Pkgs.		Description.	Weight lb.	c.
1	W P (in estate mark)	37	1	ch			
			1	hf-ch	pekoe	160	34
2	Do	38	2	ch			
			1	hf-ch	pek sou	250	29
3	Do	39	5	ch			
			2	hf-ch	dust	971	23
4	C W M	40	5	do	bro or pek	300	56
5	Do	41	13	ch	or pek	1170	51
6	Do	42	7	do	pek sou	630	41
7	Wewessa	43	25	hf-ch	bro pek	1375	56
8	Do	44	21	do	pekoe	1155	48
9	Do	45	20	do	pek sou	1100	41
10	Do	46	4	do	sou	220	35
11	Do	47	2	do	dust	180	26
12	M C (in estate Lark)	48	6	ch			
			1	hf-ch	sou	652	34
13	Do	49	3	ch			
			1	hf-ch	pek fans	485	27
14	Do	50	1	ch	dust	158	19
15	P M	51	1	do			
			1	hf-ch	red leaf	119	27
16	Do	52	1	ch	dust	125	27
17	G W S	53	3	do	pek sou	285	33
18	Do	54	3	do	pek dust	393	26
19	Depedene	55	7	hf-ch	bro pek	350	58
20	Do	56	9	do	pekoe	450	44
21	Do	57	17	do	pek sou	850	38
22	H D	58	15	do	bro tea	750	33
23	Do	59	2	do	bro mix	100	27
24	Do	60	1	do	dust	80	26
25	J J S (in estate mark)	61	4	ch	bro pek	400	50 bid
26	Do	62	4	do	pekoe	382	43 bid
27	Narangoda	63	19	do	unas	1900	41
28	Do	64	1	do	congou	85	33
29	Do	65	1	hf-ch	dust	65	26
30	South Wana Rajah	66	12	ch	bro pek	1200	66 bid
	Do	67	28	do	pekoo	2800	46 bid
31	Do	68	8	do	pek sou	800	40 bid
32	G W	69	9	do	sou	906	31
33	Do	70	1	do	dust	150	24

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 5th Nov., the undermentioned lots of Tea (69,292 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Aldie	330	2	ch	dust	200	25
2	Do	332	1	do	congou	100	29
3	Fetteresso	334	3	do	dust	345	25
4	B T N	336	1	do	sou	96	29
5	S P R	338	3	hf-ch	bro pek	150	48
6	Do	340	7	do	unas	350	38
7	Nugagalla	342	13	do	bro or pek	650	70
8	Do	344	36	do	pekoe	1800	51
9	Do	346	1	do	pek sou	56	41
10	Thornfield	348	25	do	bro pek	1500	67
11	Do	350	20	ch	pekoe	2000	45
12	Iddagodda	352	18	hf-ch	bro pek	972	49
13	Do	354	15	do	pekoe	705	40
14	Do	356	11	do	pek sou	462	37
15	Do	358	1	ch	sou	78	33
16	Do	360	1	hf-ch	dust	53	26
17	Debatgama	362	16	do	bro or pek	960	49 bid
18	D (in estate mark)	364	2	do	bro pek	200	46
19	Do	366	3	do	pekoe No. 1	300	40
20	Do	368	1	do	do No. 2	100	37
21	K	370	15	hf-ch	or pek	880	41 bid
22	Chesterford	372	18	do	bro pek	1080	55
23	Do	374	28	do	pekoe	1400	40
24	Good Hope	376	2	box	congou	40	29
25	Do	378	3	do	bro mix	60	27
26	Do	380	6	do	dust	150	26
27	Beverley	382	14	hf-ch	bro pek	840	48 bid
28	Do	384	31	do	pekoe	1705	43
29	Do	386	11	do	pek sou	550	37
30	Do	388	6	do	sou	342	33
31	Do	390	4	ch	pk dust	300	23
32	Do	392	5	do	dust	375	26
33	N	394	12	hf-ch	sou	600	37
34	N	396	1	do	bro mix	50	28
35	N	398	1	do	dust	75	26
36	Melrose	400	54	do	bro pek	3240	52 bid
37	Do	402	50	do	pekoe	2750	out
38	Do	404	17	do	pek sou	2210	25
39	Atherfield	406	2	do	dust	160	34
40	Do	408	5	do	bro tea	250	28
41	Do	410	1	do	bro mix	50	28
45	Portmore	418	29	ch	bro pek	3190	56 bid
46	Do	420	12	do	pekoe	1200	47 bid
47	L H	422	4	do	bro pek sou	448	27
48	K H	424	1	hf-ch	bro pek	60	out
49	Do	426	1	do	pekoe	50	30
50	Do	428	3	do	pek sou	150	28
51	Do	430	2	do	sou	100	25
52	Do	432	7	do	unas	350	30
53	Do	434	1	do	congou	40	25
57	Luccombe	442	32	ch	bro or pek	2880	42 bid
58	Do	444	32	do	pekoe	2880	37 bid
59	Do	446	33	do	pek sou	2970	34
60	Do	448	3	do	pek fan	270	25
61	St. Hellier's	450	5	do	bro tea	500	27
62	Do	452	6	hf-ch	dust	450	26
63	Patiagama	454	1	ch	flwery or pek	110	57 bid
64	Do	456	8	do	bro pek	800	54 bid
65	Do	458	33	do	pekoe	3135	43
66	Do	460	2	do	dust	300	26
67	Avisawella	462	2	ch	unas	210	39
68	Do	464	2	do	sou	450	36
69	Do	466	3	do	dust	450	26
70	C & D	468	25	hf-ch	bro pek	1500	70
71	Do	470	17	do	pekoe	952	53
72	Do	472	20	do	pek sou	1120	45
73	Farnham	474	23	do	bro or pek	1150	60
74	Do	476	22	do	pekoe	990	47
75	Do	478	52	do	pek sou	2340	39
76	Do	480	9	do	bro tea	405	32
77	Do	482	1	do	fan	60	29
78	Do	484	1	do	dust	65	26
79	W G	486	1	ch	red leaf	64	27
80	Do	488	1	do	dnst	96	25
	(The Yatiyantota Tea Company Limited.)						
81	Polatagama	490	26	hf-ch	bro pek	1300	58
82	Do	492	33	do	pekoe	1650	43
83	Do	494	50	do	pek sou	2500	38
84	Abamalla	496	14	do	bro mix	840	33
85	Do	498	6	do	dust	450	26
86	N M	500	1	do	red leaf	75	29
87	Moralioya	502	7	do	bro or pek	385	51
88	Do	504	12	do	pekoe	600	40
89	Do	506	7	do	pek sou	350	38
90	Do	508	1	do	bro tea	45	34
1	Do	510	1	do	pek dust	70	26

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 5th Nov., the under-mentioned lots of Tea (59,711 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	G O	276	7 hf-ch	dust	539	27
2	B T	277	23 ch	bro mix	2300	33
3	Maria	279	13 do	bro pek	1430	53 bid
4	Do	281	13 do	sou	1300	38 bid
5	Ardlaw	283	10 hf-ch	bro pek	520	60
6	Do	285	9 ch	pekoe	855	44
7	Do	287	1 hf-ch	bro tea	45	35
8	Do	288	1 ch	dust	65	27
9	Kadienlena	289	34 do	pek sou	2720	37 bid
10	Do	10	1 do	dust	130	27
11	Brownlow	11	18 hf-ch	bro or pek	900	78
12	Do	13	19 ch	bro pek	2090	62
13	Do	15	22 do	pekoe	2090	55
14	Do	17	10 do	pek sou	900	42
15	Do	19	1 do	dust	100	26
16	Dunbar	20	16 do	bro pek	1600	58 bid
17	Do	22	14 do	pekoe	1400	40 bid
18	Do	24	4 do	pek sou	400	36
19	Do	26	1 do	bro tea	140	23
20	Madooltenne	27	8 do	bro pek	880	51
21	Do	29	25 do	pekoe	2500	37
22	Eilandhu	31	14 do	bro pek	1050	52
23	Do	33	17 do	pekoe	1275	41
24	Do	35	11 do	pek sou	825	37
25	Do	37	1 hf-ch	dust	78	25
26	Abbotsford	38	18 do	bro or pek	1080	61 bid
27	Do	40	27 ch	bro pek	2700	49 bid
28	Do	42	27 do	pekoe	2700	43 bid
29	Do	44	13 do	pek sou	1300	37 bid
30	Great Valloy	46	46 do	bro pek	4600	45 bid
31	Do	48	33 do	pekoe	2970	38 bid
32	Do	50	30 do	pek sou	2550	37 bid
33	Manikwatte	52	19 hf-ch	bro pek	1140	53
34	Do	54	12 ch	pekoe	1140	40
35	Handro-kande	56	1 hf-ch	or pek	50	46
36	Do	57	2 do	bro pek	100	42
37	Do	58	11 do	pekoe	550	37
38	Do	60	1 do	red leaf	50	23
39	Do	61	1 do	congou	33	29
40	Warriapolla	62	23 do	sou	1150	29
41	Do	64	4 do	red leaf	180	20
42	Elston	65	2 do	dust	140	23
43	Do	66	6 do	congou	300	32
44	Ayr	67	16 do	bro pek	720	58
45	Do	69	19 do	pekoe	760	42
46	Do	71	18 do	pek sou	720	38
47	Do	73	2 do	congou	86	33
48	Do	74	1 do	fans	50	29
49	Do	75	1 do	pek dust	70	27
50	Blackburn	76	4 ch 1 hf-ch	bro pek	495	51
51	Do	78	8 ch	pekoe	800	40
52	Do	80	1 do	sou	108	34
53	Do	81	1 do	dust	100	25

Messrs A. H. THOMPSON & Co. put up for sale at the Chamber of Commorce Sale-room today, 12th Nov., the undermentioned lots of Tea (59,562 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Harrow	1	7 hf-ch	bro pek	416	54 bid
2	Do	3	7 do	pekoe	385	47
3	Do	5	2 do	pek sou	102	39
4	K	6	27 do	bro pek	1485	57 bid
5	K	8	39 box	pekoe No. 1	780	47 bid
6	K	10	35 hf-ch	pekoe ,, 2	1575	38
7	K	12	48 do	pek sou	2160	36
8	K	14	12 do	pek dust	840	27
9	Kanangama	16	16 ch	bro pek	1680	42 bid
10	Do	18	17 do	pekoe	1615	39 bid
11	Do	20	15 do	pek sou	1350	35
16	G C	28	2 hf-ch	pekoe	94	42
17	Do	29	4 do	bro pek	230	51
18	Torrington	30	19 ch	bro or pek	2090	56 bid
19	Do	32	25 do	bro pek	2750	50 bid
20	Do	34	40 do	pekoe	4000	43 bid
21	Do	36	34 do	pek sou	3060	35 bid
22	Do	38	12 hf-ch	dust	960	28
23	A A	40	40 ch	pekoe	4000	40 bid

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
24	Agra Oya	42	12 do	bro pek	1200	53 bid
25	Do	44	5 do	pekoe	500	41 bid
26	Brac	45	23 do	bro pek	2300	46 bid
28	Nahalma	49	28 hf-ch	bro pek	1540	54 bid
29	Do	51	68 ch	pekoe	6800	37 bid
30	Do	53	1 do	congou	60	31
31	Comillah	54	5 hf-ch	bro pek	275	41 bid
32	Do	56	6 do	pekoe	300	37 bid
33	Do	58	11 do	pek sou	550	34 bid
34	Do	60	1 do	dust	70	25
35	Agar's Land	61	48 do	bro or pek	2400	withd'n
36	Do	63	45 do	pekoe	2250	withd'n
37	Do	65	30 do	pek sou	1350	withd'n
38	S A	67	9 do	sou	405	withd'n
39	Do	69	38 do	sou No. 2	1520	withd'n
40	Do	71	4 do	or pek dust	260	withd'n
41	Do	72	2 do	dust	150	withd'n
42	D E C (in estate mark)	73	5 do	red leaf	250	28
43	Horagoda	74	15 do 7 do	bro pek	1100	52 bid
44	Do	76	28 do 16 do	pekoe	2120	38 bid
45	Do	78	11 do 7 do	pek sou	865	36
46	Do	80	1 do	dust	82	26
47	F E S (in estate mark)	81	2 ch	bro pek	158	57
48	Do	82	3 do	pekoe	285	44
49	Do	83	1 do	pek sou	100	39

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 12th Nov., the undermentioned lots of Tea (72,140 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Blairavon	71	13 ch	bro pek	1300	50 bid
2	Do	72	14 do	pekoe	1260	42 bid
3	Do	73	15 do	pek sou	1350	37 bid
4	Do	74	1 do	bro tea	120	28
5	Do	75	1 do	dust	120	26
6	Benveula	76	21 hf-ch	bro pek	1260	50 bid
7	Do	77	14 ch	pekoe	1400	39 bid
8	Do	78	6 do	pek sou	660	36 bid
19	Do	79	2 do	red leaf	200	31
10	Do	80	2 do	dust No. 1	140	29
11	Do	81	1 do	dust No.	70	25
12	Hattanwella	82	34 hf-ch	pekoe	1700	38 bid
13	B S	83	6 ch 2 box	red leaf	609	28
14	Do	84	3 ch	pek sou	300	35
15	Burnside	85	17 hf-ch	bro pek	1020	56 bid
16	Do	86	25 do	pekoe	1250	40 bid
17	Do	87	2 do	pek sou	100	37
18	Do	88	1 do	dust	60	38
19	K P (in estate mark)	89	2 ch 1 hf-ch	pek sou	250	31
20	Do	90	1 ch	dust	158	20
21	Wereagalla	91	17 do	bro pek	1700	52 bid
22	Do	92	20 do	pekoe	1700	43
23	Do	93	21 do	pek sou	1680	37
24	Do	94	3 hf-ch	bro tea	150	35
25	Do	95	1 do	red leaf	70	28
26	Do	96	2 hf-ch	dust	150	27
27	A	97	2 ch	sou	210	36
28	K P W	98	13 do	bro pek	1300	61
29	Do	99	21 do	pekoe	1890	48
30	Do	100	17 do	pek sou	1445	43
31	Hetherton	1	4 hf-ch	bro tea	178	30
32	Do	2	1 do	dust	84	26
33	Forest Hill	3	21 ch	bro pek	2100	53 bid
34	Do	4	23 do	pekoe	2070	41 bid
35	Do	5	12 do	pek sou	1080	37
36	Do	6	1 do	dust	110	28
37	S B R	7	7 do	or pek	630	45
38	Do	8	8 do	pekoe	640	37
39	Do	9	14 do	pek sou	1400	35
44	Wishford	14	18 do	bro pek	1080	58 bid
45	Do	15	14 ch	pekoe	1400	48
46	Do	16	6 do	pek sou	588	41
47	Do	17	1 hf-ch	dust	80	28
53	X Y Z	23	3 do	bro pek	150	46
54	Do	24	2 ch	pekoe	200	36
55	Do	25	2 do 1 hf-ch	pek sou	250	36

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
56	X Y Z	26	2 ch	unas	170	35
57	Do	27	3 do	bro tea	300	28
58	T	28	5 hf-ch	pek fans	370	29
59	T	29	4 do	dust	300	27
60	S P R S	30	2 ch	pek sou	167	35
61	Do	31	4 do	bro tea	360	28
62	Do	32	3 do	pk dust	390	27
63	Alokolla	33	15 hf-ch	bro pek	975	54
64	Do	34	20 ch	pekoe	2100	41 bid
65	Do	35	26 hf-ch	pek sou	1300	37
66	Do	36	2 do	dust	170	26
67	Roseneath	37	25 do	bro pek	1500	54
68	Do	38	14 ch	pekoe	1400	41
69	Do	39	15 do	pek sou	1500	37
70	Hallowella	40	12 ch	or pek	960	66 bid
71	Do	41	16 do	pekoe	1280	50 bid
72	Do	42	12 do	pek sou	960	41 bid
73	E	43	2 do	pek sou	170	36
74	T N E	44	6 hf-ch	unas	300	39 bid
75	Hattanwella	45	14 do	bro pek	700	52 bid
76	Do	46	1 do	sou	50	33
77	Do	47	2 do	pek dust	100	26
78	A S C	48	10 do	bro pek sou	500	35
79	Do	49	1 do	red leaf	50	30
80	Panmure	50	12 ch	bro pek	1320	57
81	Do	51	16 do	pekoe	1680	45 bid
82	Do	52	12 do	pek sou	1200	39
83	Do	53	1 do	dust No 1	100	28
84	Do	54	1 do	dust ,, 2	105	25
85	Do	55	1 do	bro mix	120	28
86	I N G (in estate mark)	56	5 do	bro pek	500	57
87	Do	57	16 do	pekoe	1440	44
88	C T M	58	5 do	bro mix	450	29
89	Do	59	2 hf-ch	dust	140	27
95	Y	65	4 ch	bro sou	320	29 bid
96	Y	66	1 do 4 hf-ch	bro mix	294	28

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, October 17th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 17th Oct. :—

Ex "Ajax"—Maousakelle, 3 bags 96s.

Ex 'Duke of Devonshire"—Maousava, 7 bags 93s; 1 87s 6d; 1 79s.

Ex "Ormuz"—Gampaha, 1b 114s; 2c 113s; 2c 105s 6d; 1c 1b 102s 6d; 1c 140s; 1t 98s 6d; 1t 96s 6d; 1b 103s; 1t 86s 6d. Kirklees, 1c 1b 110s; 1c 104s; 1t 101s; 1b 131s; 1b 97s 6d; 2 bags 91s 6d. Battawatte, 1b 114s; 2c 112s; 1c 104s; 1t 102s; 1b 137s; 1t 97s 6d. Balmoral, 1t 100s. (B)T, 1b 93s.

Ex "Arcadia"—Ouvah JB, 1b 107s; 1c 1b 105s; 1t 102s; 1b 121s; 1b 98s 6d; 1 bag 101s 6d. Ouvah GA, 1t 108s; 2c 1b 105s 6d; 2c 103s; 1t 102s; 1t 123s; 1t 99s; 2 bags 104s 6d.

Ex "Cyclops"—Mausagalla, 1c 109s; 3c 106s 6d; 2c 103s 6d; 1c 136s; 1t 98s; 1 bag 106s 6d.

Ex "Massilia"—Brookside, 1c 1b 106s 6d; 5c 105s 6d; 1c 1b 105s; 1t 127s; 1c 100s; 1 bag 106s.

MINCING LANE, October 24th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 24th Oct. :—

Ex "Pack Ling"—Rillamulle, 1b 106s; 2c 1t 104s 6d; 1c 1b 103s 6d; 1b 121s; 1b 98s; 1 bag 103s.

Ex "Austral"—Macoolussa, 2t 104s; 1c 101s 6d; 1b 96s 6d; 1b 108s.

Ex "Ajax"—Dambatenne, 1c 108s; 2c 105s; 5c 1t 104s 6d; 1c 137s; 1b 108s; 1c 1b 94s; 3 bags 102s 6d.

Ex "Pack Ling"—Indulgashena, 1b 107s 6d; 3c 106s 6d; 2c 1b 104s; 1b 138s; 1t 108s; 1b 101s; 1b 140s; 2 bags 98s.

Ex "Benlawers"—Dambatenne, 1 bag 93s 6d. Gonamotava, 1 bag 93s 6d.

Ex "Pack Ling"—Blackwood, 1t 110s; 2c 106s 6d; 1c 103s 6d; 1b 138s. Deagalla, 1c 109s; 2c 1b 105s 6d; 1b 101s 6d; 1b 131s; 3 bags 97s 6d: 1 97s; 2 96s 6d.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)

MINCING LANE, Oct. 24th, 1890.

Mark	Natural Stem	Renewed	Root
Doomba	1¾d	2¾d to 3d	...
Portree	2¾d to 4½d	3d to 3½d	...
Lanka Plantation Co., Ld.	2½d	...	3½d
Maria	2¼d	3d	...
St. Clair, hybrid	2½d to 3d	3½d	...
Amblamana	2¾d	...	...
LL in diamond	2¾d	3d	2½d
Tillicoultry	...	4d to 4½d	...
Harangolla	2d to 4d	3d	...
Manickwatte	3d	...	4d
Uvakellie	...	3½d to 5d	...
Wariagalla, hybrid (quill 7d to 8½d)	3d	3d to 3½d	...
Gowerakellie	3d	4½d to 5d	...
,, hybrid	3½d	4½d to 5d	...
Niabedda	4½d	7d to 7½d	..
Wiharagalla	2d to 4½d	5d	...
Wattegodde, hyd.	3d	...	...
Bearwell	...	4½d	3d
Warwick	3½d	...	...
Beaumodt	2¾d to 3d	2½d	...
Deagalle	3d	...	...
ECB, T in dia.	4d to 4½d	5d	...
JW, G ,,	3d	3½d	...
Lynford	3½d, mixed	4½d to 5d	...
Thornfield	...	4d to 4½d	...
Midlands	2½d	...	...
Vedehette	2½d	...	...
Waitalawa	2½d	3¾d	...
PDM	...	3¼d to 3½d	...
Geddes	2¼d	...	...

OFFICINALIS.

Mark	Natural Stem	Renewed	Root
Doomba	2½d	3½d	3¼d to 3 d
Cobo, ledger	2d	5¼d	...
Eskdale	4d	8½d to 9d	7d
Lanka Plantations Co. Ltd.	4d	8½d	...
Maria	3½d to 4d	6d to 6½d	5d
Dukinfield	5d	8½d	...
Ardlaw, ledger	6½d to 9½d	9d	...
Midlands	4½d	...	...

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Oct. 17th, 1890.

Ex "Oanfa"—Suduganga, 55 bags 110s 6d; 14 75s; 4 71s; 19 45s 6d; 4 53s 6d.

MINCING LANE, Oct. 24th, 1890.

Ex "Hector"—Delgolla, 8 bags 98s; 3 62s; 2 80s; 1 56s.

Ex "Asia"—Crystal Hill, 12 bags 100s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Oct. 17th, 1890.

Ex "Ningchow"—Le Vallon, 3 cases 1s 9d.

Ex "Liguria"—Kobanella, 3 cases 9½d.

Ex "Hispania"—Galleutenne, 2 cases 1s 11d; 2 1s 10d.

Ex "Arabic"—MKD, 4 cases 1s 1d; 2 1s 2d.

Ex "Glenearn"—Kobanella, 6 cases 2s 2d; 3 1s 4d; 3 1s 8d.

Ex "Glenlyon"—(RG), 3 cases 2s 4d; 2 2s 6d; 2 1s 9d; 2 1s 2d; 2 1s 3d; 2 1s. (EG), 3 cases 2s 7d; 3 1s 9d; 3 1s 2d.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 25.] COLOMBO, DECEMBER 3, 1890. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room today, 12th Nov., the undermentioned lots of Tea (55,669 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Bow Hill	82	2 ch	dust	280	26
2	Agra Ouvah	83	8 hf-ch	bro pek fans	400	35
3	Do	84	17 do	pek sou	765	41
4	Do	86	55 do	pekoe	2475	44 bid
5	Do	88	1 do	bro pk (H. M. 2)	50	48
6	Do	89	65 do	bro pek	3250	52 bid
7	H J R	101	16 ch	bro pek	1440	56
8	Do	103	19 do	pekoe	1520	42 bid
9	Do	105	13 do	pek sou	1105	37 bid
10	Do	107	1 hf-ch	dust	80	27
11	Anchor (in estate mark)	108	18 do	bro pek	990	61 bid
12	Do	110	24 ch	pekoe	2400	50
13	Do	112	12 do	pek sou	1200	43
14	Do	114	19 hf-ch	bro mix	1102	33
15	Do	116	8 do	dust	600	27
16	Tientsin	117	15 do	bro pek	900	58 bid
17	Do	119	20 ch	pek sou	1700	42
18	Mocha	121	36 hf-ch	bro pek	1980	62 bid
19	Do	123	26 ch	pekoe	2600	58
20	Do	125	12 do	pek sou	1140	49
21	J B	127	42 hf-ch	bro pek	2100	53
22	Do	129	17 do	pekoe	850	47
23	Do	131	13 ch	pek sou	1170	39
24	L	133	3 do	dust	480	27
25	L	134	3 do	congou	285	35
26	L	135	1 do	flower dust	180	23
30	Esperanza	141	2 hf-ch	bro or pek	112	48
31	Do	142	10 do	or pek	500	63
33	Bittacy	146	16 hf-ch	bro pek	960	60 bid
34	Do	148	26 do	pekoe	1560	46 bid
35	Blackburn	150	3 ch 1 hf-ch	bro pek	385	49 bid
36	Do	151	7 ch	pekoe	700	38 bid
37	Do	153	2 do	pek sou	200	37
38	Do	154	1 do	dust	95	28
39	Albion	155	14 do	bro pek	1470	58
40	Do	157	12 do	pekoe	1080	46
41	Do	159	12 do	pek sou	960	42
42	Do	161	2 hf-ch	dust	170	28
43	B (in estate mark)	162	3 do	congou	180	34
44	Do	163	1 do	dust	60	27
45	Ayr	164	19 do	bro pek	855	59 bid
49	Glencorse	172	12 do	bro pek	1260	61 bid
50	Do	174	27 hf-ch	pekoe	1215	46
51	Do	176	22 do	pek sou	990	40 bid
52	Do	178	1 ch	dust	150	27
55	Wewelmadde	183	20 hf-ch	bro pek	1200	49 bid
56	Do	185	20 ch	pekoe	2100	38 bid
60	Gonavy	191	16 do	bro pek	1600	72
61	Do	193	11 do	pekoe	990	62
62	Do	195	6 do	pek sou	540	48
63	Do	197	1 hf-ch	dust	75	29

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 12th Nov., the undermentioned lots of Tea (87,933 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	R	512	4 ch	bro mix	360	27
2	R	514	3 do	dust	420	27
3	California	516	1 hf-ch	bro pek	46	61
4	Do	518	2 do	pekoe	85	41
5	Do	520	4 do	pek sou	224	37
6	H	522	6 do	bro pek	270	42
7	H	524	8 do	pek sou	384	38
8	H	526	1 do	red leaf	44	25
9	Galkadua	528	6 do	bro pek	300	47
10	Do	530	12 do	pekoe	600	38
11	Do	532	35 do	pek sou	1750	37
12	W T	534	8 hf-ch	bro pek	400	5
13	Do	536	14 do	pekoe	700	42 bid
16	Bowlana	542	14 do	bro pek	1400	51 bid
17	Do	544	7 do	pekoe	630	40 bid
18	Do	546	20 do	pek sou	1700	37 bid
	(The Yataderia Tea Company, Limited.)					
19	Yataderia	548	11 ch	bro pek	1177	45
20	Do	550	25 do	pekoe	2325	38
21	Do	552	8 do	pek sou	704	36
22	Do	554	17 do	bro pek	1890	47
23	Do	556	19 do	pekoe	1767	39
24	Do	558	8 do	pek sou	704	37
25	Do	560	3 do	pek fan	300	29
26	Do	562	18 do	bro pek	1926	48
27	Do	564	24 do	pekoe	2232	40
28	Do	566	14 do	pek sou	1232	36
29	Blairgowrie	568	30 hf-ch	bro pek	1500	56 bid
30	Do	570	14 do	pekoe	1400	42 bid
31	Do	572	8 ch	pek sou	760	38
32	Do	574	2 hf-ch	bro mix	82	28
33	Dehiowitta	576	20 ch	bro pek	2100	51
34	Do	578	35 do	pekoe	3500	40
35	Do	580	22 do	pek sou	2090	36
36	Doonevale	582	11 do	bro pek	1100	47
37	Do	584	19 do	pek sou	1710	36 bid
38	Do	586	1 do	bro tea	120	30
39	V	588	3 do	pekoe	240	37
40	V	590	3 do	pek sou	300	35
41	V	592	1 do	sou	90	30
42	V	594	5 do	bro tea	450	27
43	C D	596	28 do	pekoe	1400	39 bid
44	D	598	2 hf-ch	pek sou	92	38
45	F H	600	28 do	pek sou	1260	37 bid
46	D E	2	17 do	pek sou	850	38 bid
47	Theberton	4	16 ch	bro pek	1600	43 bid
48	Do	6	9 do	pekoe	900	39
49	Do	8	6 do	pek sou	600	36
50	Do	10	2 do	pek dust	200	26
51	C R D	12	2 hf-ch	dust	120	28
52	Do	14	7 do	red leaf	385	28
53	Mukeloya	16	15 do	bro pek	975	55
54	Do	18	20 do	pekoe	1100	49
55	Do	20	13 do	pek sou	650	39
56	Do	22	1 ch	dust	80	27
57	S	24	7 hf-ch	pek sou	350	37 bid
58	I	26	11 do	pek sou	462	38
59	D	28	1 ch	pek sou	100	36 bid
60	P	30	13 hf-ch	pek sou	716	37
61	W	32	9 ch	pek sou	855	36
62	G	34	3 do	bro mix	285	34
63	H	36	3 do	bro tea	330	28
64	H	38	4 hf-ch	red leaf	180	23
65	Nahaveena	40	31 do	bro pek	1395	54
66	Do	42	12 do	pekoe	480	43
67	Do	44	28 do	pek sou	1120	38
68	N A	46	20 do	pek sou	900	43
69	Do	48	2 do	dust	140	27
70	Do	50	1 do	congou	36	32
71	Harangalla	52	19 ch	bro pek	1900	55
72	Do	54	24 do	pekoe	2280	44
73	Do	56	7 do	pek sou	630	38
74	St. Catherine	58	8 do	bro pek	720	51
75	Do	60	5 do	pekoe	450	39
76	Do	62	4 do	pek sou	340	36
77	Radella	64	20 do	bro pek	2000	53
78	Do	66	20 do	pekoe	1600	42
79	Do	68	18 do	pek sou	1440	37
83	B	76	23 do	pek sou	2300	34
84	N	78	1 hf-ch	bro mix	50	39
85	H	80	5 ch	bro mix	500	29
86	F	82	1 hf-ch	pek fans	60	29
87	A	84	1 ch	congou	100	37
88	F M	86	24 hf-ch	pek sou	1080	38
94	Monrovia	98	5 do	bro pek	250	47
95	Do	100	8 do	pekoe	400	45
96	Do	102	6 ch	pek sou	600	36
97	Do	104	2 do	unas	200	35
98	Do	106	1 do	congou	73	32
99	Do	108	1 hf-ch	dust	73	26
100	E K	110	2 do	pekoe	110	36
101	Do	112	1 do	sou	50	31
102	Palmerston	114	6 do	bro pek	360	62
103	Do	116	10 ch	pekoe	1000	46
104	Do	118	9 do	pek sou	900	40
105	Do	120	6 hf-ch	dust	420	28
106	Vril	122	2 ch	pekoe	200	39

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
107	H S (in estate mark)	124	3	ch	dust	420	28
108	C	126	3	do	bro mix	300	28
109	H	128	2	hf-ch	broken	120	28
110	A	130	1	do	unas	60	30
111	C F (in estate mark)	132	16	do	bro pek	800	81 bid
112	Do	134	28	ch	pekoe	2100	63
113	Do	136	5	do	pek sou	375	47
114	Do	138	1	do	sou	60	39
115	Do	140	2	hf-ch	dust	120	29
116	Bandarapolla	142	30	do	or pek	1500	58

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today 19th Nov., the undermentioned lots of Tea (75,968 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Glanrhos	1	5	ch	bro pek	475	45 bid
2	Do	2	7	do	pekoe	595	40
3	Do	4	10	do	pek sou	800	37
4	Do	6	2	do	congou	160	33
5	A K A, C (in diamond	7	16	hf-ch	bro pek	800	56 bid
6	Do	9	45	do	pekoe	2250	42
7	Do	11	6	do	sou	300	36
8	Do	13	1	do	dust	71	27
9	Do	14	2	do	fans	121	28
10	Bogahagodawatte	15	3	do	bro pek	195	48 bid
11	Do	16	5	do	pekoe	250	33
12	Do	18	8	do	pek sou	495	34 bid
13	Do	20	2	do	fans	120	28
14	Do	21	1	do	dust	70	27
15	K K	22	2	do	bro pek	100	35
16	Agars's Land	23	48	do	bro or pek	2400	58 bid
17	Do	25	45	do	pekoe	2250	48 bid
18	Do	27	30	do	pek sou	1350	40 bid
19	Do	29	9	do	sou	405	37 bid
20	Do	31	38	do	sou No. 2	1520	35 bid
21	Do	33	4	do	or pek dust	260	32
22	Do	34	2	do	dust	150	29
23	Brae	35	23	ch	bro pek	2300	46 bid
24	Do	37	13	do	pekoe	1300	35 bid
25	Engurrakande	39	36	do	bro pek	3600	42 bid
26	Do	41	70	do	pekoe	7000	36 bid
27	Hakurugalla	43	12	do	bro pek	1200	52 bid
28	Do	45	18	do	pekoe	1620	40 bid
29	Do	47	6	do	pek sou	540	35 bid
30	Do	48	2	do	dust	300	27
31	Do	49	2	do	bro tea	200	31 bid
37	Kottagalla	58	7	hf-ch	bro or pek	420	60 bid
38	Do	60	15	ch	or pek	1350	45 bid
39	Do	62	10	do	pek sou	900	41
40	Do	64	3	do	dust	255	27
41	K	65	27	hf-ch	bro pek	1485	56 bid
42	D F	66	16	ch	bro pek	1680	42 bid
43	Do	67	17	do	pekoe	1615	39
44	Horagoda	68	22	hf-ch	bro pek	1100	50 bid
45	Do	70	44	do	pekoe	2120	39 bid
46	Nahalma	72	27	do	bro pek	1485	55
47	Do	74	28	ch	pekoe	2800	37 bid
48	Do	76	1	do	congou	60	30
49	Do	77	1	hf-ch	dust	75	27
50	B O H	78	1	ch	or pek	100	41
51	Do	79	16	do	bro pek	2080	35 bid
52	Do	81	11	do	pekoe	935	32 bid
53	Woodend	83	32	do	bro pek	3360	49 bid
54	Do	85	30	do	pekoe	3000	38 bid
55	Do	87	3	do	pek sou	285	33 bid
56	Y—D (in diamond	88	12	ch	bro or pek	1200	66 bid
57	Do	90	37	do	pekoe	3145	45 bid
58	F (in estate mark	92	21	do	sou	1680	31 bid
59	Lavant	94	12	do	bro pek	1200	48 bid
60	Do	96	23	do	pekoe	1840	39 bid
61	Do	98	17	do	pek sou	1360	35 bid
62	Do	99	2	do	dust	250	27
63	A G C	100	10	hf-ch	dust	750	27
64	G	101	1	do	unas	41	30
65	M	102	5	box	Ceylon tea	50	30
	H W D		2	hf-ch	pekoe	80	25 bid
	Do		2	do	dust	120	24
	Dicmukalana		2	do	sou	80	28 bid

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 19th Nov., the undermentioned lots of Tea (67,962 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Ismalle	144	4	hf-ch	dust	300	27
2	,,	146	1	ch	bro mix	80	27
3	,,	148	7	hf-ch	do	53	27
4	L B K	150	4	ch	red leaf	400	29
5	Galdola	152	5	hf-ch	unas	250	35
6	S P A	154	12	do	sou No. 1	600	36
7	,,	156	2	do	sou No. 2	100	33
8	S P B	158	2	do	unas	100	37
9	S P I	160	7	do	unas	385	35
10	S P V	162	3	do	bro pek	180	49
11	,,	164	5	do	pekoe	250	38
12	,,	166	3	do	pek sou	150	36
13	B & D	168	2	ch	dust	304	27
14	,,	170	3	do	red leaf	300	27
15	Berragalla	172	20	do	bro pek	2220	47 bid
16	,,	174	32	do	pekoe	3520	39 bid
17	,,	176	21	do	pek sou	2100	36 bid
18	,,	178	3	do	dust	450	29
19	,,	180	1	do	red leaf	194	26
20	,,	182	2	do	bro tea	115	33
21	Chalmers	184	10	ch	bro pek	700	67
22	,,	186	40	hf-ch	pekoe	2400	48
23	,,	188	10	do	pek sou	600	43
24	,,	190	4	ch	fans	360	35
25	,,	192	2	do	bro mix	150	31
26	Leangapella	194	28	do	or pek	2800	52 bid
27	,,	196	18	do	pekoe No. 1	1800	41 bid
28	L G E	198	11	hf-ch	or pek	635	39 bid
29	,,	200	9	do	pekoe No. 1	465	35
30	,,	202	1	ch	dust	90	16
31	Kirimettia L M	204	9	hf-ch	bro pek	450	53
32	,,	206	31	do	pekoe	1550	39
33	,,	208	6	do	pek sou	300	35
34	,,	210	2	do	pek fans	150	34
35	G	212	3	ch	bro mix	300	36
36	G	214	1	do	red leaf	100	35
37	G	216	2	do	dust	160	27
38	G T W	218	2	hf-ch	bro mix	100	31
39	,,	220	4	do	pek sou	200	36
40	,,	222	2	do	dust	162	25
41	G	224	1	do	bro pek	50	38
42	G	226	1	do	pekoe	50	28
43	G	228	2	do	pek sou	100	26
44	G	230	3	do	congou	150	28
45	G	232	5	do	red leaf	250	25
46	Midlothian	234	10	do	bro pek	500	61
47	,,	236	8	ch	pekoe	880	48
48	,,	238	2	hf-ch	congou	100	35
9	Tonacombe Uva	240	6	ch	bro pek	660	59
50	,,	242	14	do	pekoe	1330	45
51	,,	244	15	do	pek sou	1350	40
52	,,	246	4	do	sou	360	38
53	,,	248	3	do	dust	240	29
54	D E	250	1	box	bro bek	35	47
55	,,	252	10	hf-ch	pekoe	509	39
56	,,	254	3	do	pek sou	150	36
57	,,	256	1	do	pek fans	50	30
58	,,	258	1	box	congou	21	29
59	,,	260	1	do	dust	21	29
60	I G	262	3	ch	sou	270	33
61	,,	264	1	do	bro tea	120	27
62	Kirimettia	266	2	do	bro tea	208	36
63	,,	268	2	do	bro mix	208	36
64	Koladeniya	270	1	do	bro tea	126	27
65	,,	272	1	do	red leaf	210	27
66	S S S	274	1	do	pek sou	100	33
67	,,	276	1	do	red leaf	135	21
68	L (in estate-mark)	278	10	do	bro tea	1260	28
69	Vellaioya	280	3	do	or pek	294	51 bid
70	,,	282	3	do	bro or pek	300	53 bid
17	,,	284	1	do	pek fans	110	33
72	V O	286	2	do	dust	224	27
73	,,	288	1	do	bro tea	110	26
74	B E R	290	12	do	bro pek	1080	42 bid
75	,,	292	22	do	pek sou	2100	34
76	,,	294	4	do	dust	560	26
77	M W	296	1	hf-ch	pekoe	60	34
78	,,	298	1	ch	unas	100	33
79	,,	300	2	do	pekoe	160	38
80	,,	302	2	hf-ch	pek dust	150	26
81	,,	304	1	do	dust	90	28
82	,,	306	1	do	sou	40	30

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
83	H (in esate mark)	308	2 hf-ch	pekoe	108	34
84	D D (in estate mark)	310	1 do	bro pek	62	41
85	,,	312	4 do	bro pex sou	216	34
86	,,	314	1 do	pek sou	45	32
87	Glenorchy	316	18 do	bro or pek	900	82
88	,,	318	23 do	bro pek	1035	73
89	,,	320	41 do	pekoe	1845	56
90	Chesterford	322	21 do	bro pek	1260	56
91	,,	324	35 do	pekoe	1750	43
92	N M	326	3 do	unas	120	39
95	Clunes	332	38 hf-ch	bro pek	1900	55
96	,,	334	74 do	pekoe	3330	38 bid
97	,,	336	24 do	pek sou	1200	37
98	W G	338	2 box	bro pek	40	54
99	,,	340	2 do	pekoe	36	37
100	,,	342	1 do	pek sou	18	34
	The Yatiyantota Tea Company, Limited					
101	Polatagama	344	20 hf-ch	bro pek	1200	58
102	,,	316	33 do	pekoe	1650	45
103	,,	348	35 do	pek sou	1750	38
104	Kenmare	350	5 do	bro or pek	325	44
105	,,	352	20 do	or pek	1000	66 bid
106	,,	354	19 do	bro pek	1045	69 bid
107	,,	356	21 do	pek sou	945	52 bid
108	,,	358	2 do	sou	80	42
109	,,	360	4 do	dust	300	28
110	Traquair	362	7 do	bro pek	380	40
111	,,	364	2 do	pekoe	102	42
112	,,	366	7 do	pek sou	359	36
113	C H	368	12 ch	dust	1011	28
114	,,	370	13 do	red leaf	1313	27
115	L	372	1 hf-ch	bro pek	69	37
116	L	374	1 do	pek sou	38	36
117	L	376	1 box	do	19	34
118	B	378	1 ch	red leaf	65	24

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 19th Nov., the undermentioned lots of Tea (50,811 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
1	M A H	67	3 ch	red leaf	270	25
2	Do	68	4 do	congou	360	30
3	Wewesse	69	41 hf-ch	bro pek	2255	52 bid
4	Do	70	41 do	pekoe	2255	39 bid
5	Do	71	30 do	pek sou	1630	27 bid
6	Do	72	5 do	sou	275	36
7	Do	73	7 do	dust	525	27
8	Kitulgala	74	14 ch	pekoe	1120	41
9	Do	75	13 do	pek sou	1040	43
10	Do	76	6 do	bro pek fans	600	36
11	Do	77	1 do	dust	125	29
12	Harmony	78	17 hf-ch	bro pek	850	59
13	Do	79	24 ch	pekoe	2160	40
14	Do	80	6 do	pek sou	540	36
15	Do	81	4 hf-ch	pek fans	300	30
16	Do	82	4 do	bro mix	180	35
17	Lyndhurst	83	7 ch	bro pek	700	52
18	Do	84	11 do	pekoe	990	38
19	Do	85	14 do	pek sou	1260	36
20	Mapitigama	86	5 do	bro pek	525	52
21	Do	87	7 do	pekoe	630	38
22	Do	88	8 do	pek sou	720	35 bid
23	St. Andrew's	89	15 hf-ch	or pek	990	65
24	Do	90	45 box	or pek	900	57
25	Do	91	18 hf-ch	bro pek	1170	47
26	Do	92	15 do	pekoo	975	44
27	Ellekanda	93	4 do	bro pek	224	62
28	Do	94	6 do	pekoe	290	44 bid
29	Do	95	8 do	pek sou	400	38
30	Do	96	6 do	bro mix	300	36
31	Do	97	1 do	dust	75	27
32	Aadnevon	98	15 ch	bro pek	1500	57 bid
33	Do	99	16 do	pekoe	1410	45
34	Silvorton	100	11 hf-ch	or psk	605	49 bid
35	Do	1	16 do	pekoe	800	40 bid
36	Do	2	3 do	pek sou	150	36
37	S	3	1 do	bro tea	53	30
38	S	4	2 do	pek dust	151	28
39	Hattanwella	5	3 do	bro pek	150	53
40	Do	6	16 do	pekoe	800	41
41	Do	7	2 do	pek sou	100	34
42	Do	8	1 do	bro mix	40	27
43	Denmark Hill	9	2 ch	bro pek	220	64 bid
44	Do	10	1 do	pekoe	97	54 bid
45	Do	11	1 do	pek sou	85	45 bid

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
46	Killin	12	3 ch	bro pek	300	45 bid
47	Do	13	3 do	pekoe	285	35 bid
48	Do	14	5 do	pek sou	450	38
49	Do	15	1 do	bro tea	100	28 bid
50	W O	16	4 do	bro pek	400	45
51	Do	17	3 do			
			3 hf-ch	sou	450	27
52	W R	18	1 ch			
			1 hf-ch	pek fans	202	52
53	Crurie	19	12 ch	bro pek	1320	53 bid
54	Do	20	15 do	pekoe	1425	41
55	Do	21	23 do	pek sou	2070	37
56	Do	22	6 do	sou	510	35
57	Yelebende	23	8 do	bro pek	720	54
58	Do	24	15 do	pekoe	1275	41 bid
59	Do	25	9 do	pek sou	765	37
60	C C	26	1 do	pekoe	100	35
61	C (in estate mark	27	8 hf-ch	pekoe	442	38
62	A A	28	3 ch			
			2 hf-ch	bro tea	415	30
63	S W G	29	4 do	pek sou	182	32
64	Do	30	5 do			
			2 ch	bro mix	454	25
65	Do	31	4 hf-ch	red leaf	104	26
66	M K A	32	13 ch	bro pek	1300	50 bid
67	Do	33	14 do	pekoe	1260	40 bid
68	W P F	34	18 hf-ch	bro pek	1080	58 bid
69	R (in estete mark)	35	5 ch	pekoe	500	29
70	Do	36	7 do	dust	1120	28
71	Allakolla	37	20 do	pekoe	2100	40 bid
72	D K A	38	6 do	pek sou	660	39

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 19th Nov., the under mentioned lots of Tea (73,450 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	L	198	5 bf-ch	pek fans	225	28
2	L	199	6 do	sou	240	34
3	L	200	1 do	congou	40	30
4	L	201	1 do	red leaf	50	28
5	D E	202	4 ch	dust	364	27
6	Killaloo	203	46 do	sou	4140	33
7	Do	205	21 do	unas	1680	21
8	Galgawatte	207	36 hf-ch	bro pek	1800	51 bid
9	Do	209	15 ch	pekoe	1500	39 bid
10	Do	211	12 do	pek sou	1200	37 bid
11	P N R	213	7 hf-ch	bro pek	350	51
12	Do	215	34 do	pekoe	1350	39
13	Do	217	4 do	pek sou	200	36
14	Faithlie	218	16 do	bro pek	880	58 bid
15	Do	220	20 ch	pekoe	1800	42 bid
17	Do	223	4 hf-ch	dust	300	30
18	Alnoor	224	2 do	bro or pek	100	46
19	Do	225	10 do	bro pek	500	52
20	Do	227	10 do	pek	500	41
21	Do	229	1 do	sou	50	36
22	Do	230	1 do	unas	50	41
23	Do	231	3 do	fans	150	34
24	Abbotsford	232	29 ch	bro pek	2900	59 bid
25	Do	234	33 do	pekoe	3300	46 bid
26	Do	236	22 do	pek sou	2200	38 bid
27	Galkande-watte	238	26 do	bro pek	2600	60
28	Do	240	31 do	pekoe	2790	45
29	Eila	242	13 do	bro pek	1300	44 bid
30	Do	244	9 do	pekoe	720	39 bid
31	Do	246	8 do	pek sou	640	39
32	Do	248	1 do	pek dust	125	27
33	G K W	249	2 do	bro toa	180	36
34	Do	250	3 bf-ch	dust	240	26
41	Wewelmadde	260	22 hf-ch	bro pek	1320	53
42	Do	262	18 do	pek sou	936	38
43	Hattangalla	264	18 ch	bro pek	1903	51 bid
44	Do	266	32 do	pekoe	3200	38 bid
45	Do	268	13 do	pek sou	1274	30
46	B T	270	17 do	bro mix	1445	33
47	Lawrence	272	27 ch			
			1 hf-ch	sou	2745	34
48	Kurundu Oya	274	12 do	bro pek	760	66
49	Do	276	23 do	pekoe	1270	57
50	Do	278	1 ch	dust	90	33

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight. lb.	c.
51	Marguerita	280	10	hf-ch	bro pek	600	65
52	Do	282	9	do	pekoe	450	51
53	Do	284	17	do	pek sou	935	40
54	Comar	286	4	ch	bro pek	400	48
55	Do	288	3	do	bro mix	300	28
56	Deeside	289	14	do	bro pek	1400	58 bid
57	Do	10	26	do	pekoe	2340	46 bid
58	Do	12	2	do	congou	195	36
59	Do	13	2	hf-ch	dust	140	27
60	Madooltenne	14	16	ch	bro pek	1760	47 bid
61	Do	16	16	do	pekoe	1600	37
62	Logan	18	21	hf-ch	bro pek	1050	68
63	Do	20	18	do	pekoe	810	56
64	Do	22	40	do	pek sou	1800	42
65	Do	24	8	do	sou	360	36
66	Do	26	8	do	dust	520	29
67	Gouravilla	27	2	do	pekoe	98	49
68	Kadienlena	28	1	ch	pek sou	80	40
69	Dickoya	29	45	do	pekoe	4140	44 bid
70	Cruden	31	11	do	sou	1045	35
71	Do	33	1	do	dust	100	26

Messrs A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 26th Nov., the undermentioned lots of Tea (46,484 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Kanangama	1	12	ch	bro pek	1260	47
2	Do	3	12	do	pekoe	1140	38
3	Do	5	14	do	pek sou	1260	34
4	D G A O (in estate mark)	7	21	do	bro pek	2100	62 bid
5	Do	9	13	do	pekoe	1300	48 bid
6	Do	11	25	do	pek sou	2500	39 bid
7	Do	13	2	do	congou	200	30
8	Do	14	2	do	dust	280	27 bid
9	Relugas	15	25	hf-ch	bro pek	1375	55 bid
10	Do	17	15	ch	pekoe	1650	42
11	Do	19	14	do	pek sou	1400	36
12	Agraoya	21	8	do	bro pek	800	52 bid
13	Do	23	8	do	pekoe	800	41 bid
14	Do	25	12	do	do No 2	1200	36 bid
15	Nahalma	27	23	hf-ch	bro pek	1265	51 bid
16	Do	29	23	ch	pekoe	2300	39 bid
17	Do	31	1	do	congou	100	30
18	G C	32	5	do	bro pek	475	49 bid
19	Do	34	7	do	pekoe	595	37 bid
20	J A (in estate mark)	36	16	hf-ch	bro pek	800	61 bid
21	Do	38	45	do	pekoe	2250	41 bid
22	A S	40	3	do	bro pek	195	45
23	P P	41	1	ch	bro pek	100	44
24	Do	42	11	do	pekoe	935	35 bid
25	B ae	44	23	do	bro pek	2300	45 bid
26	Do	46	13	do	pekoe	1300	33 bid
27	Kottagalla	48	7	hf-ch	bro or pek	420	55 bid
28	Do	50	15	ch	or pek	1350	48 bid
29	Star (in estate mark	52	16	do	bro pek	2080	34 bid
30	Do	54	18	do	pekoe	1620	36 bid
31	Do	56	6	do	pek sou	540	32 bid
32	F (in estate mark)	57	21	do	sou	1680	32 bid
33	St. M (in estate mark)	59	10	do	bro pek	500	60 bid
34	Do	61	9	hf-ch	pekoe	414	43 bid
35	Densworth	63	20	ch	bro pek	2000	53
36	Do	65	20	do	or pek	2000	43 bid
37	Do	67	36	do	or pek	3600	39 bid
38	Do	69	17	do	pekoe	1700	36 bid
39	Do	71	5	do	pek sou	500	34 bid
40	Do	72	2	do	bro tea	200	30

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Mincing Lane, October 31st, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 31st Oct.:—

Ex "Britannia"—Kumaradola, 16 bags 93s d; 1 88s; 12 88s 6d; 2 76s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 7th Nov.:—

Ex "Ping Suey"—Leangawelle, 1b 106s; 2c 105s; 1c 1b 108s 6d; 5c 1b 106s; 1c 1b 103s 6d; 1t 135s; 2 bags 1t 102s; 1b 127s; 1 bag 103s; 2 bags 97s. Sherwood, 1c 104s; 2 98s.

Ex "Navigator"—Beauvais, 1t 104s; 1t 102s; 1c 100s; 1b 103s; 1b 93s; 1b 95s; 1 bay 100s. Niabedda, 2c 107s; 1t 138s: 1c 100s; 1b 95s; 1c 91s; 2 bags 103s.

Ex "Traveller"—Niabedda, 2c 1t 107s.

Ex "Gulf of Lyons"—St. Leonards, 1t 93s; 3c 1b 90s 6d; 1b 92s; 1b 85s.

CEYLON CINCHONA SALES IN LONDON.

(*From Wilson, Smithett, & Co.'s Circular.*)

Mincing Lane, Nov. 7th, 1890.

Mark	Natural Stem	Renewed	Root
Holbrook	3d	4½d to 5d	...
Delrey	3d	...	...
Wewesse	2d	3½d to 4d	...
Yapame	...	5d	...
O B E C, St. Coombs	3½d	6½d	5½d
Stockholm	...	2½d to 3d	...
Sutton	2¾d	...	...
Wattagalla	1¾d	2½d	...
Morankande	1¼d to 1½d	3d	...
Dunsinane	...	5d to 5½d	...
Tillicoultry	3d	5d to 5½d	...
Huldemulle	2½d	4½d	2½d
Hanipha	3d to 3½d	5½d to 8½d	...
Wavekelle	1¾d	...	...
Uva Estate	1¼d	2¾d to 3d	...
M C C Co.	...	4¼d to 4½d	...
Laymastotte	3½d	6d	...
Middleton	2d to 3d	...	...
Rangbodde	2¼d to 2½d	4d	...
O G	2½d to 3½d	...	...
Officinalis.			
Eskdale	3d	7½d	7d
O B E C, St. Combes	4d	8½d	8d to 10d
Tulboddy	4d	...	...
Niabedda	...	8d	...
Uva Estate	3d	4d	...
Lauriston	3d	7d	6½d to 7d

CEYLON CACAO SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Mincing Lane, Oct. 31st, 1890.

Ex "Arabia"—(GC), 10 bags 60s; 3 55s.

Ex "Oanfa"—Goonambil, 6 bags 92s 6d; 2 60s; 1 71s.

Ex "Britannia"—Maragalla, 13 bags 91s 6d; 5 64s; 3 50s; 16 86s 6d; 6 66s; 4 111s 6d.

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Mincing Lane, Oct. 31st, 1890.

Ex "Pak Ling"—Vicarton, 2 cases 2s 10d; 1 1s 8d; 1 9d; 2 bags 1s 4d.

Ex "Bellerophon"—Delpotonoya, 1 case 1s 8d.

Ex "Hispania"—Deakensland, 3 cases 1s 3d.

Ex "Benvenue"—(MG), 3 cases 1s 2d.

Ex "Peninsular"—(13), 10 cases 1s 2d; 4 1s 1d.

Ex "Duke of Devonshire"—Galaha, 1 case 2s 1d; 1 1s 9d; 2 1s 4d; 1 1s; 2 1s 7d. Katooloya, 1 case 2s 1d; 1 1s 7d; 3 1s 4d; 2 11½d. Katoolmoola, 2 cases 2s 4d; 1 1s 4d; 2 1s 6d; 3 11d. Midlands, 1 case 2s; 1 1s 7d; 1 1s 6d; 1 11d.

Ex "Pak Ling"—Kitoolmoola, 1 case 2s 9d; 1 2s 4d; 1 2s; 1 1s 9d: 1 1s.

Ex "Traveller"—Old Medegama, 4 cases 1s 8d; 1 1s 4d; 1 1s 7d. Malabar, 2 cases 1s 10d; 1 1s 7d.

Ex "Austral"—Deanstone, 1 case 2s 3d: 1 2s 1d; 1 1s 3d; 1 1s 2d; 1 1s 0½d. Kirklees, 1 case 2s; 1 1s 4d; 1 1s 3d; 1 1s 1d: 1 9d; 1 1s 6d; 1 1s 5d. Gampaha, 1 case 1s 9d; 1 1s 3d; 1 1s 6d; 1 1s; 1 8d.

Ex "Britannia"—New Peacock, 1 case 1s 9d; 1 1s 6d; 1 1s 3d.

Ex "Pak Ling"—(A&Co., 1 case 1s 3d; 1 1s 5d; 1 1s 6d.

Ex "Clan Macdonald"—(SM), 1 case 1s 8d.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 26.] COLOMBO, DECEMBER 17, 1890. {PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 26th Nov., the undermentioned lots of Tea (32,627 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Hangran Oya	34	1 ch	bro tea	100	29
2	Do	35	2 do	dust	300	28
3	Do	36	2 do	congou	180	31
4	Do	37	19 do	pek sou	1805	36 bid
5	Do	39	8 do	pekoe	760	43
6	Do	41	8 do	bro pek	880	50
7	F (in estate mark	43	12 do	fans	1260	31
8	Ivies	45	22 hf-ch	bro pek	1100	57
9	Do	47	32 do	pekoe	1440	44
10	Do	49	18 ch	pek sou	1620	35 bid
11	Do	51	2 hf-ch	dust	140	27
12	P	52	3 hf-ch	unas	150	29
13	Pate Rajah	53	3 ch	bro pek	300	36
14	Do	54	1 hf-ch	pekoe	50	37
15	Do	55	1 ch	pek sou	90	34
16	G	56	10 hf-ch	bro mix	450	31
17	Great Valley	58	43 ch	bro pek	4300	52
18	Do	60	24 do	pekoe	2160	41
19	Do	62	32 do	pek sou	2720	38
20	Dickapittia	64	23 do	bro pek Nos. 1-23	2300	47
21	Do	66	18 hf-ch	bro pek „ 24-41	912	40 bid
22	Do	68	22 ch	pekoe Nos. 42-63	1870	38 bid
23	Do	70	26 do	pek sou „ 64-89	2210	33 bid
24	Do	72	2 do	dust „ 90-1	266	27
25	Maddegedera	73	34 hf-ch	bro pek	1700	47 bid
26	Do	75	30 do	pekoe	1500	40
27	Do	77	1 do	dust	80	28
28	Kataboola	78	3 ch	sou	300	33
29	Do	79	4 do	bro mix	380	29
30	Yarrow	80	7 hf-ch	bro pek	448	60
31	Do	82	15 do	pekoe	900	45
32	Do	84	6 do	pek sou	336	38

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 26th Nov., the undermentioned lots of Tea (88,780 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Downside	380	6 hf-ch	red leaf	300	28
2	Do	382	6 do	congou	300	30
3	Do	384	18 do	pek sou	900	34
4	Do	386	11 do	pekoe	550	38
5	Do	388	10 do	bro pek	500	45
6	Court Lodge	390	22 do	bro pek	1254	72 bid
7	Do	392	18 do	pekoe	846	66
8	Do	394	21 do	pek sou	945	52
9	Do	396	1 do	sou	47	38
10	Do	398	1 ch	dust	140	28
11	Citrus	400	7 hf-ch	bro pek	420	50
12	Do	402	16 do	pekoe	800	39
13	Do	404	11 do	pek sou	495	35
14	Do	406	3 ch	fans	244	27
15	Do	408	1 hf-ch	congou	50	30
16	Do	410	1 do	bro mix	43	25
17	Duckwari	412	5 ch	pekoe No. 2	500	33
18	Do	414	2 do	dust	280	29
19	Do	416	3 do	fans	384	29
20	Do	418	1 do	congou	85	29
	The Yataderia Tea Co., Limited.					
21	Yataderia	420	9 ch	bro pek	963	48
22	„	422	23 do	pekoe	2139	37
	The Ceylon Tea Plantations Co., Limited.					
23	Mariawatte	424	43 ch	or pek	4065	49 bid
24	Do	426	48 do	pekoe	4320	39 bid
25	Do	428	20 do	pek sou	1600	37 bid
26	Hayes	430	30 hf-ch	bro or pek	1500	45 bid
27	Do	432	70 do	or pek	3500	40 bid
28	Do	434	88 do	pek sou	4400	37
29	Do	436	42 do	pekoe	2100	38
	The Ceylon Tea Plantation Co., Limited.					
30	Alton	438	13 do	or pek	585	65 bid
31	Do	440	8 ch	bro pek	880	65 bid
32	Do	442	15 do	pekoe	1350	48 bid
33	Do	444	13 do	pek sou No 1	1170	42
34	Alton	446	22 hf-ch	pek sou No 2	1100	38
35	Do	448	10 do	fans	1000	39
36	Do	450	8 hf-ch	dust	600	27
37	Do	452	8 do	bro tea	400	37
38	A	454	6 do	bro tea	270	29
39	D	456	4 do	pekoe	200	36
40	D	458	2 do	pek dust	106	29
41	Ukuwella	460	14 ch	bro pek	1470	51 bid
42	Do	462	13 do	pekoe	1300	42 bid
43	Do	464	13 do	pek sou	1235	40
44	Do	466	2 do	congou	200	32
45	Do	468	2 hf-ch	dust	150	28
46	K (in estate mark)	470	1 ch 1 hf-ch	red leaf	96	26
47	Do	472	1 ch	congou	84	33
48	Middleton	474	33 hf-ch	bro pek	2145	56
49	Do	476	14 ch	pekoe	1400	43
	The Yataderia Tea Co., Limited.					
50		478	11 ch	bro pek	1177	46 bid
51		480	18 do	pekoe	1674	36 bid
52		482	12 do	pek sou	1056	34 bid
53		484	6 do	bro tea	558	33
54	Andaugodde	486	2 hf-ch	bro pek	120	44
55	Do	488	2 do	pekoe	78	37
56	Do	490	3 do	pek sou	141	35
57	K V	492	3 ch	congou	270	34
58	Do	494	3 do	fans	300	39
62	Galkadua	502	12 hf-ch	bro pek	600	44
63	Do	504	15 do	pekoe	750	36
64	Do	506	15 do	pek sou	750	35
65	Marlborough	508	9 ch	bro pek	900	57
66	Do	510	20 do	pekoe	2000	43
67	Do	512	6 do	pek sou	600	38
68	Do	514	1 do	dust	145	28
77	Avisawella	532	3 ch	unas	315	35
78	Do	534	2 do	sou	210	29
79	Queensland	536	5 do	pek fans	375	28
80	Madulkelly	538	2 do	sou	192	33
81	Do	540	1 do	pek fans	120	29
82	Do	542	1 do	fans	100	25
83	Bismark	544	2 do	dust	280	29
84	C & D	546	11 hf-ch	bro pek	660	71
85	Do	548	7 do	pekoe	392	49
86	Do	550	4 do	pek sou	224	41
87	H (in estate mark)	552	2 do	bro pek	82	47 bid
88	Do	554	2 do	pekoe	80	38 bid
89	Do	556	4 do	pek sou	200	36 bid
90	Bandara-polla	558	25 do	or pek	1250	58
91	Do	560	40 do	pekoe	2000	43
92	Do	562	32 do	pek sou	1440	37
93	G A	564	1 ch	sou	87	29
94	Do	566	6 box 2 hf-ch	dust	308	25
95	Donside	568	5 ch	sou	425	31
96	Do	570	1 hf-ch	dust	70	27
97	D E	572	9 ch	pekoe	900	35
101	M	580	5 do	bro or pek	280	50
102	M	582	12 do	pekoe	595	36
103	M	584	2 do	pek sou	100	34
104	S S	586	6 ch	pekoe	600	34
105	H & H	588	4 do	bro mix	600	28

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 26th Nov., the undermentioned lots of Tea (25,640 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	S P R S	39	4 ch 11 hf-ch	pekoe	916	37 bid
2	Do	40	2 do	red leaf	88	23
3	B (in estate mark)	41	8 ch	bro pek	800	40 bid
4	Do	42	10 do	pekoe	1000	40 bid
5	Do	43	3 do 3 hf-ch	sou	450	26
6	Do	44	5 ch	bro mix	500	30
7	Do	45	1 do 2 hf-ch	dust	261	27

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
8	A W G	46	4 hf-ch	pek sou	182	33
9	Do	47	4 do	red leaf	104	26
10	Do	48	5 do			
			2 ch	bro mix	454	27
11	Kuruwitty	49	4 hf-ch	bro pek	216	60 bid
12	Do	50	7 do	pekoe	336	48
13	Do	51	10 do	pek sou	480	39
14	Do	52	4 do	sou	180	33
15	Do	53	4 do	bro tea	216	30
16	Do	54	1 do	dust	70	28
17	Do	55	1 do	congou	48	30
18	P M	56	1 ch			
			2 hf-ch	pekoe	228	26
19	Do	57	1 ch			
			1 hf-ch	sou	146	28
20	X	58	3 do	pek sou	150	27
21	Mousa	59	3 ch	pek sou	288	31
22	Do	60	1 do			
			1 hf-ch	dust	185	27
23	Stinsford	61	4 ch	pek dust	470	27
24	H F	62	7 hf-ch	bro mix	413	28
25	K	63	1 do			
			1 box	pekoe	70	39
26	Silverton	64	9 hf-ch	or pek	495	49
27	Do	65	16 do	pekoe	800	42
28	Do	66	2 do	pek sou	100	35 bid
29	S	67	1 do	congou	50	28
30	S	68	1 do	pek dust	80	27 bid
31	Ovoca	69	20 do	bro pek	1100	71
32	Do	70	28 ch	pekoe	2800	57
33	Do	71	15 do	pek sou	1500	43
34	Y Z	72	13 hf-ch	pekoe	767	35
35	Do	73	15 do	pek sou	735	38
36	Do	74	8 ch	pek fans	1064	31
37	Do	75	2 do	dust	245	28
38	Do	76	2 do	congou	168	28
39	G M O	77	4 hf-ch	bro pek	240	46
40	Do	78	10 do	bro mix	600	28
41	D	79	1 do	pek sou	85	53 bid
42	D	80	1 do	bro tea	100	31
43	Wewesse	81	41 hf-ch	bro pek	2255	52 bid
44	Do	82	30 do	pek sou	1630	37 bid
45	Depedene	83	6 do	bro pek	300	54 bid
46	Do	84	12 do	pekoe	600	40 bid
47	Do	85	15 do	pek sou	750	37
48	H D	86	17 do	bro tea	850	33
49	Do	87	1 do	dust	80	27

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room, today, 3rd Dec., the undermentioned lots of Tea (39,662 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	K	1	11 hf-ch	bro pek	605	54
2	K	3	12 do	pekoe No. 1	600	41
3	K	5	30 do	pekoe	1350	39
4	K	7	31 do	pek sou	1395	35
5	K	9	2 do	pek dust	150	28
6	Woodeod	10	14 ch	bro pek	1470	50 bid
7	Do	12	14 do	pekoe	1400	38
8	Do	14	5 do	pek sou	475	34 bid
9	Do	16	1 do	dust	135	27
10	Nahalma	17	30 bf-ch	bro pek	1650	48
11	Do	19	28 ch	pekoe	2800	37 bid
12	Do	21	1 hf-ch	congou	60	30
13	Do	22	1 do	dust	75	28
14	W	23	1 do	bro pek	54	withd'n
15	W	24	1 do	pekoe	54	withd'n
16	Yaba Ella	25	18 do	bro pek	900	52
17	Do	27	19 do	pekoe	855	37
18	Do	29	1 do	dust	72	26
19	Do	30	1 do	coogou	54	27
24	C M	38	5 hf-ch	bro pek	275	45 bid
25	Do	40	18 do	pekoe	1620	38 bid
26	Do	42	6 do	pek sou	540	31 bid
27	Nahalma	44	59 ch	pekoe	5900	38
28	Relugas	46	25 hf-ch	bro pek	1375	46 bid
29	Do	48	12 ch	pekoe	1320	38 bid
30	Do	50	13 do	pek sou	1300	32 bid
31	Do	52	3 hf-ch	dust	213	27
32	Lavant	53	12 ch	bro pek	1200	43 bid
33	Do	55	26 do	pekoe	2080	34 bid
34	Do	57	2 do	dust	260	28
35	F, in estate mark	58	31 do	sou	2480	32
36	L	60	1 do	bro mix	80	25
37	A G C		2 hf-ch	dust	1500	27

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 3rd Dec., the undermentioned lots of Tea (72,968 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight lb.	c.
1	Calverton	86	2 ch	dust	240	27
	Do	87	1 do	fans	100	31
3	D K	88	7 hf-ch	sou	350	36
4	Do	90	6 do	fans	300	88
5	Do	102	8 do	bro tea	400	30
6	Do	104	1 do	dust	70	27
7	E W	105	5 do	dust	350	28
8	Do	106	8 do	congou	400	31
9	Mocha	108	42 hf-ch	bro pek	2310	60 bid
10	Do	110	33 ch	pekoe	3300	56
11	Do	112	12 do	pek sou	1140	44
12	Abbotsford	114	33 do	bro pek	3300	52 bid
13	Do	116	22 do	pekoe	2200	43 bid
14	Do	118	15 do	pek sou	1500	36 bid
15	Dunbar	120	17 do	bro pek	1700	50 bid
16	Do	122	17 do	pekoe	1615	38 bid
17	F T	124	45 hf-ch	bro pek	2250	withd'n
18	Do	126	13 do	pekoe	650	withd'n
19	Do	128	15 ch	pek sou	1350	withd'n
20	Do	130	1 do			
			2 hf-ch	bro mix	160	withd'n
21	D H	131	18 do	bro pek	912	37 bid
22	Kadienlane	133	38 ch	bro pek	3420	50 bid
23	Do	135	43 do	pekoe	3440	39 bid
24	Do	137	32 do	pek sou	2560	36 bid
25	Do	139	1 do	dust	130	28
26	Labugama	140	20 hf-ch	bro pek	800	58
27	Do	142	28 do	pekoe	1120	39
28	Do	144	2 do	pek dust	150	29
32	Ainoor	151	2 hf-ch	bro or pek	100	44
33	Do	152	18 do	bro pek	900	45
34	Do	154	18 do	pekoe	900	37
35	Do	156	2 do	sou	100	30
36	Do	157	2 do	fans	120	29
37	H J R	158	13 ch	bro pek	1235	48 bid
38	Do	160	19 do	pekoe	1520	39
39	Do	162	13 do	pek sou	1105	35 bid
40	F F	170	2 do	bro mix	194	26
41	Do	171	2 do	dust	250	27
42	Albion	172	34 do	bro pek	3570	51 bid
43	Do	174	31 do	pekoe	2914	39 bid
44	Do	176	17 do	pek sou	1530	41
45	Do	178	3 do	dust	255	28
46	Agra Ouvah	179	33 hf-ch	bro pek	1650	53 bid
47	Do	181	32 do	pekoe	1440	39 bid
48	Do	183	9 do	bro pek fans	693	30
49	Poogoda	185	8 do	bro pek	400	33
50	Do	187	15 do	pekoe	675	31
51	Do	189	12 do	pek sou	540	28
52	Madooltenne	191	13 ch	bro pek	1430	45 bid
53	Do	193	17 do	pekoe	1700	33 bid
54	Browolow	195	1 do	dust	140	28
55	B T	196	36 do	bro tea	3240	33
56	Penrhos	198	13 hf-ch	bro pek	780	65 bid
57	Do	200	24 do	pekoe	1410	50
58	Do	202	2 do	pek sou	1400	42

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 3rd Dec., the undermentioned lots of Tea (18,132 lb.), which sold at under :—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Kattukitula	88	1 hf-ch	bro pek	58	43 bid
2	Do	89	2 do	pekoe	94	37
3	Do	90	3 do	pek sou	120	32 bid
4	J J S, in estate mark	91	3 ch	bro pek	300	36 bid
5	Do	92	2 hf-ch	pekoe	100	30 bid
6	Do	93	1 ch	pek sou	90	34
7	W V, in estate mark	94	4 do	unas	400	8 bid
8	Do	95	1 hf-ch	fans	50	29
9	S S	96	3 ch			
			3 hf-ch	sou	450	24 bid
10	Do	97	5 ch	bro mix	500	27 bid
11	Do	98	1 do			
			2 hf-ch	dust	261	26 bid
12	Do	99	1 ch			
			2 hf-ch	pekoe	228	out
13	Do	100	1 ch			
			1 hf-ch	sou	146	out
14	Narangoda	1	30 ch	unas	3000	37 bid
15	Do	2	2 hf-ch	dust	120	27
16	R S	3	4 ch			
			6 hf-ch	pekoe	651	36 bid
17	A A	4	9 ch	pekoe	900	28 bid

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
18	P O	5	3	hf-ch	bro pek	168	44 bid
19	Do	6	7	do	unas	348	33 bid
20	Do	7	1	do	dust	57	27
21	M	8	1	do	unas	35	35
22	C	9	31	do	bro mix	1705	29 bid
23	Kuruwitty	10	5	do	bro pek	270	55
24	Do	11	2	do	pekoe	102	42
25	Do	12	11	do	pek sou	550	36 bid
26	Do	13	7	do	unas	371	36
27	Do	14	1	do	congou	40	32
28	Do	15	1	do	dust	76	29
29	Do	16	2	do	red leaf	100	28
30	T, in estate mark	17	2	do	sou	100	33
31	Do	18	15	do	unas	750	35 bid
32	Do	19	1	do	mixed	52	32
33	Do	20	2	do	dust	160	27
34	Lyndhurst	21	11	ch	bro pek	1100	48 bid
35	Do	22	15	do	pekoe	1350	37 bid
36	Do	23	17	do	pek sou	1530	31 bid
37	Do	24	1	do	dust	120	27
38	Mapitigama	25	4	do	bro pek	400	48 bid
39	Do	26	6	do	pekoe	540	37 bid
40	Do	27	8	do	pek sou	720	32 bid
41	Do	28	1	do	dust	120	27

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 3rd Dec., the undermentioned lots of Tea (87,886 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Aldie	590	2	ch	dust	200	28
2	Do	592	1	do	congou	100	33
3	Do	594	1	do	congou	77	33
4	L	596	7	hf-ch	unas	490	38
10	P	8	4	hf-ch	bro pek	175	55 bid
11	Do	10	10	do	pekoe	500	38
12	Do	12	1	do	dust	60	28
13	Mausakellie	14	33	do	bro pek	3980	50 bid
14	Do	16	33	ch	pekoe	130	10 bid
15	Do	18	1	do	dust	093	24
16	Gona Adika	20	19	hf-ch	bro pek	1045	55 bid
17	Do	22	68	do	pekoe	3400	39 bid
18	Do	24	12	do	pek sou	540	35 bid
19	Meddetenne	26	4	do	bro pek	200	54
20	Do	28	3	ch	pekoe	300	41
21	Do	30	5	do	pek sou	500	36
22	Do	32	2	hf-ch	dust	120	28
23	Do	34	1	do	congou	50	33
24	Clunes	36	28	do	bro pek	1400	48
25	Do	38	50	do	pekoe	2250	36 bid
26	Do	40	21	do	pek sou	1050	34
27	Dehiowitta	42	18	ch	bro pek	1890	48
28	Do	44	31	do	pekoe	3100	36 bid
29	Do	46	17	do	pek sou	1615	35
30	Sogama	48	3	do	or pek	240	57 bid
31	Do	50	2	do	bro or pek	180	57 bid
32	Do	52	3	do	bro pek	270	62 bid
33	M C	54	10	do	unas	1000	26
34	Norwood	56	2	do	unas	200	35 bid
35	Monaco	58	1	do	dust	170	26
	The Yataderia Tea Company, Limited.						
36	Yataderia	60	14	ch	bro pek	1498	48
37	Do	62	17	do	pekoe	1700	38
38	Do	64	16	do	pek sou	1408	35
39	Do	66	5	do	bro tea	465	29
40	H E P, (in estate mark	68	17	hf-ch	bro pek	1020	61 bid
41	Do	70	39	do	pekoe	2145	50
42	Do	72	21	do	pek sou	1050	41
43	Do	74	2	do	dust	160	30
44	Columbia	76	20	do	bro pek	1200	69 bid
45	Do	78	18	do	pekoe	900	54
46	Do	80	3	do	pek sou	150	39
47	Do	82	2	do	dust	160	30
48	Rickarton	84	15	do	dust	1125	29
49	Do	86	2	do	bro tea	112	21
50	L, in estate mark	88	1	box	or pek	32	28
51	Do	90	1	do	pek sou	34	28
52	G L, in estate mark	92	22	ch	bro pek	2200	52
53	Do	94	16	do	pekoe	1440	41
54	Do	96	9	do	pek sou	720	36
55	Attabage	98	4	hf-ch	pek fan	300	29
56	Do	100	5	do	bro mix	225	30
57	Thornfield	102	27	do	bro pek	1620	61
58	Do	104	25	ch	pekoe	2500	42 bid
59	Do	106	12	do	pek sou	1176	38
60	Do	108	3	hf-ch	pk dust	240	29
61	Goomera	110	4	ch	red leaf	400	28
62	Do	112	5	do	dust	700	28

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
69	Patiagama	126	10	ch	bro pek	1000	55
70	Do	128	24	do	pekoe	2280	40
71	Do	130	1	do	pek sou	95	35
72	Do	132	4	do	bro pek No 2	400	52
73	Do	134	4	do	dust	570	28
74	Do	136	1	do	red leaf	70	26
75	Avisawella	138	2	do	unas	210	31
76	Do	140	5	do	dust	750	27
77	H, in estate mark	142	2	hf-ch	bro pek	82	44
78	Do	144	2	do	pekoe	80	38
79	Heliers	146	6	ch	bro tea	600	28
80	Do	148	12	hf-ch	bro pek fans	960	28
81	Amblakande	150	9	ch	bro or pek	900	46
82	Do	152	11	do	pekoe	990	38
83	Do	154	3	do	pek sou	270	33
84	Do	156	4	do	sou	360	30
85	Do	158	1	do	bro mix	100	25
86	Becherton	160	4	do	bro pek	400	47
87	Do	162	12	do	pekoe	1140	38
90	K C, in estate mark	168	8	hf-ch	pek fans	400	40
91	Do	170	6	do	bro pek sou	300	32
92	Horagaskelle	172	5	do	bro pek	280	48
93	Do	174	6	do	pekoe	312	37
94	Do	176	11	do	pek sou	638	32
95	Do	178	1	do	congou	56	26
96	Do	180	2	do	bro mix	148	29
97	Farnham	182	23	do	bro or pek	1150	61
98	Do	184	25	do	pekoe	1125	46
99	Do	186	51	do	pek sou	2295	37
100	Do	188	5	do	fans	300	29
101	Do	190	1	do	dust	65	26
102	Do	192	17	do	bro tea	765	30
	The Yatiyantota Tea Company Limited.						
103	Polatagama	194	23	hf-ch	bro pek	1380	59
104	Do	196	49	do	pekoe	2450	46
105	Do	198	58	do	pek sou	2900	38
106	Abamalla	200	15	do	bro mix	900	33
107	Do	202	7	do	dust	490	28
108	Rambodde	204	12	do	bro pek	660	56
109	Do	206	12	do	pekoe	600	50
110	Do	208	14	do	pek sou	700	42
111	Do	210	1	do	congou	50	32
112	Do	212	1	do	bro tea	70	27
113	Palmerston	214	3	do	bro pek	195	59
114	Do	216	10	ch	pekoe	1000	45
115	Do	218	8	do	pek sou	800	42
116	Macaldenia	220	1 do 2 box		bro mix	121	32

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 10th Dec., the undermentioned lots of Tea (46,712 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	N	204	4	ch	bro mix	400	24
2	Killaloo	206	46	do	sou	4140	30
3	Do	208	25	do	unas	2000	22
4	Anchor, in estate mark	210	37	hf-ch	bro pek	2035	60
5	Do	212	27	ch	pekoe	2700	44 bid
6	Do	214	15	do	pek sou	1500	38 bid
7	Mocha	216	20	do	pekoe	2000	52 bid
8	Agra Oya	218	29	hf-ch	bro pek	1305	56 bid
9	Do	220	23	do	pekoe	1020	42 bid
10	Do	222	23	do	pek sou	1035	38 bid
11	Do	224	5	do	bro pek fans	350	31
12	Ossington	225	11	do	bro pek	550	44
13	Do	227	8	do	pekoe	400	39
14	Do	229	3	do	pek sou	150	35
15	Poogoda	230	43	do	bro pek	2150	28
16	Do	232	30	do	pekoe	1350	29
17	Do	234	12	do	pek sou	540	28
18	Kurundu Oya	236	3	hf-ch	bro pek	195	56
19	Do	237	7	do	pekoe	420	41
21	Logan	241	21	do	bro pek	1050	55 bid
22	Do	243	18	do	pekoe	810	43 bid
23	Do	245	30	do	pek sou	1350	38 bid
24	Do	247	9	do	sou	405	35
25	Do	249	5	do	dust	325	30
33	L	263	7	ch	fans	1050	29
34	L	264	6	do	congou	570	41
35	L	266	2	do	dust	335	26

Messrs A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 10th Dec., the undermentioned lots of Tea (44,803 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Mohedin	1	3 hf-ch	bro pek	150	56
2	Do	2	4 do	pekoe	160	39
3	Do	3	5 do	pek sou	200	34
4	Do	5	1 do	congou	45	31
5	Do	6	2 do	red leaf	74	28
6	Do	7	1 do	fans	50	28
7	Kanangama	8	14 ch	bro pek	1470	48 bid
8	Do	10	12 do	pekoe	1140	40
9	Do	12	24 do	pek sou	2160	34
10	Torrington	14	17 do	bro or pek	1870	60
11	Do	16	30 ch	bro pek	3300	46 bid
12	Do	18	37 do	pekoe	3700	41
13	Do	20	36 do	pek sou	3240	38
14	Do	22	10 hf-ch	dust	800	31
15	Nabalma	24	29 do	bro pek	1595	54
16	Do	26	30 ch	pekoe	3000	39
17	Do	28	3 hf-ch	congou	165	30
18	Do	29	1 do	dust	75	28
22	Agraoya	36	14 ch	bro pek	1400	50
23	Do	38	13 do	pekoe No 1	1300	40
24	Do	40	25 do	do No 2	2500	35
25	Do	42	1 do	dust	100	28
26	W	43	1 hf-ch	bro pek	54	43
27	W	44	1 do	pekoe	54	37
28	Ettapolla	45	16 do	bro pek	880	51
29	Do	47	18 do	pekoe	990	40
37	Dunnotar	61	20 ch	broken	2000	40 bid
38	Do	63	44 hf-ch	or pek	2200	54 bid
39	Do	65	7 ch	pekoe	630	39
40	Do	67	2 do	sou	200	33
41	Do	68	1 do	dust	110	26
42	G H K, in estate mark Ceylon	69	5 hf-ch	pek sou	225	32
43	Do	70	5 do	sou	225	26
44	Do	71	2 do	pek fans	120	28

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 10th Dec, the undermentioned lots of Tea (47,306 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	W V A	29	6 ch	bro tea	600	27
9	St. Andrew's	37	20 do	or pek	1320	66
10	Do	38	22 do	bro pek	1430	47
11	Do	39	38 do	pekoe	1431	44
12	Ella K, in estate mark	40	10 ch	pekoe	1000	42
13	Do	41	6 do	bro tea	600	30
15	Malgolla	43	49 do	bro pek	2695	57
16	Do	44	56 do	pekoe	2800	43 bid
17	Do	45	79 do	pek sou	3555	36 bid
18	Do	46	29 do	bro tea	1595	35
19	Do	47	3 do	sou	135	32
20	Do	48	9 do	dust	585	30
21	Allakolla	49	26 do	bro pek	1690	57
22	Do	50	30 ch	pekoe	3150	39 bid
23	Do	51	20 do	pek sou	2000	36
24	Roseneath	52	27 hf-ch	bro pek	1710	51 bid
25	Do	53	15 ch	pekoe	1575	39 bid
26	Do	54	15 do	pek sou	1500	36
27	Wereagalla	55	12 do	bro pek	1200	58
28	Do	56	14 do	pekoe	1190	42
29	Do	57	16 do	pek sou	1280	36
30	Do	58	2 hf-ch	bro tea	100	32
31	Do	59	1 do	dust	75	28
32	A H A	60	4 ch	unas	400	38
33	K V	61	2 do	bro pek	200	41 bid
34	Do	62	2 do	pekoe	210	33
35	Do	63	3 do	pek sou	270	29 bid
36	Do	64	4 do	bro mix	424	28
37	D B	65	5 hf-ch	pek dust	380	29
38	Do	66	8 do	pek fans	520	31
39	Do	67	3 do	pekoe	126	33
40	J J H S	68	6 do	bro pek	328	38 bid
41	Do	69	2 ch	pekoe No. 1	205	34 bid
42	Do	70	4 do	pekoe	363	33 bid
43	P	71	4 hf-ch	or pek	175	56 bid
44	B F	72	1 ch 1 hf-ch	dust	210	29
45	C T M	73	4 ch	bro mix	360	28
46	Do	74	3 hf-ch	dust	210	28
47	Panmure	75	10 ch	bro pek	1100	56
48	Do	76	15 do	pekoe	1575	44
49	Do	77	10 do	pek sou	1000	37
50	Panmure	78	1 ch	dust	140	28
51	Do	79	1 do	bro mix	120	27
52	D G	80	8 hf-ch	bro mix	400	29 bid
53	Do	81	4 do	dust	210	29
54	Do	82	5 do	fans	275	31
55	Do	83	3 do	bro pek fans	165	34
56	B B	84	8 ch	bro pek	800	37 bid
58	F	86	2 do 1 hf-ch	bro tea	277	26
59	F	87	6 box 2 hf-ch	pek fans	308	27

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, November 14th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 14th Nov. :—

Ex "City of Canterbury"—Concordia, 1b 104s; 5c 103s; 1t 122s; 1b 94s; 1 bag 103s.

Ex "Clan Fraser"—North Matale. 1c 103s; 3c 102s; 1c 1t 100s; 1c 98s; 1 bag 99s; 2c 1b 107s 6d; 4c 103s 6d; 1t 100s 6d; 1t 130s; 2 bags 102s; 7 89s: 2 80s; 1 80s 6d; 1 84s 6d; 1 71s 6d; 18 92s 6d; 4 80s; 2 80s 6d; 2 84s 6d; 1 71s 6d.

Ex "Orizaba"—Dynevor T, 3 60s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 21st Nov. :—

Ex "Clan Fraser"—Gonakelle, 1b 105s 6d; 1c 101s; 1t 98s; 1b 109s; 1b 91s; 1b 89s.

Ex "Iberia"—Delmar (OBEC), 1b 108s.

Ex 'Sarpedon"—Brooksido, 1c 1t 108s 6d; 3c 1b 105s 6d; 1c 1b 135s; 1c 99s 6d; 1 bag 103s. (ST&LC B), 1b 97s 6d; 1b 94s 6d; 1b 99s 6d; 6 bags 91s; 2 bags 94s 6d.

Ex "Navigator"—WP, 1c 104s; 3c 102s; 2c 100s; 1t 117s; 1c 98s; 1 bag 98s.

Ex "Astronomer"—Large Kelburne, 6c 1t 110s; 4c 1b 106s; 1b 98s; 1c 1b 98s 6d; 2b 125s 6d; 1 bag 104s.

Ex "Clan Fraser"—Keenagahaella, 1b 106s; 3c 105s 6d; 2c 102s 6d; 1b 97s; 1b 120s; 1b 97s; 1 bag 101s.

Ex "Ganges"—Craig, 2c 99s 6d; 5c 99s; 1b 98s 6d; 1c 93s (JMK), 1c 2t 84s 6d; 2t 1b 81s.

Ex "Sarpedon"—Hillside, 2c 106s 6d; 7c 1b 102s; 1b 136s; 1b 97s; 2 bags 103s.

Ex "Sultana"—PEA GHI B, 3 bags 109s.

Ex "Sarpedon"—Ouvah GA, 2b 103s 6d; 3c 1t 98s; 1t 1b 93s; 2 bags 98s. Ouvah AG, 3b 1c 1t 96s 6d; 1b 1 bag 82s; 1 bag 93s. Ouvah NG, 1c 104s; 1c 102s; 1b 98s; 2b 94s. Ouvah BJ, 1b 100s; 1c 1t 1b 95s; 1b 79s.

Ex "Cuzco"—Sirigalla, 31 bags 93s 6d; 4 82s 6d; 2 98s 6d; 10 78s 6d.

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, Nov 21st, 1890.

Ex "Cuzco"—Sirigalla, 8 bags 104s 6d; 1 68s.

Ex "City of Canterbury"—Maria, 12 bags 100s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, Nov. 14th, 1890.

Ex "Austral"—Koba Nellay, 2 cases 1s 4d.

Ex "Port Augusta"—(OBEC), 4 boxes 1s 4d; 1 1s 2d; 1 9d; 3 1s 9d; 1 1s 4d; 3 1s 2d: 1 1s 6d; 1 1s 5d.

Ex "Austral"—(OBEC), 3 boxes 1s 8d; 1 1s 7d; 2 1s 3d.

Ex "Port Caroline"—Malabar, 1 case 1s 2d.

Ex "Carriage"—(C), 1 packet 1s.

Ex "Ping Suey"—Sherwood, 4 cases 2s; 2 2s 4d; 3 1s 6d; 2 1s 7d; 2 11d; 5 2s 8d; 3 2s 1d; 2 1s 6d; 2 1s 7d; 2 1s 8d; 3 1s 2d; 2 1s 6d.

No. 1.] COLOMBO, JANUARY 6, 1891. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 10th Dec., the undermentioned lots of Tea (130,256 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Ismalle	222	1 ch	bro mix	56	30
2	Do	224	2 do	dust	210	27
3	Glengariffe	226	3 do	bro tea	300	37
4	Do	228	2 do	dust	174	29
5	Fettercsso	230	2 ch	sou	190	24
6	Do	232	1 do	dust	145	26
7	Sembawatte	234	26 hf-ch	pek fans	1430	30
8	Clonlara	236	1 box	pekoe	25	44
9	Do	238	1 hf-ch			
			1 box	fans	80	28
10	Do	240	2 hf-ch	dust	130	26
11	Do	242	3 do	bro tea	135	31
12	Essdale	244	21 ch	bro pek	2100	56
13	Do	246	18 do	pekoe	1440	42
14	Do	248	17 do	pek sou	1360	38
15	Halpantenne	250	2 do	bro pek	180	46
16	Do	252	2 do	pekoe	200	35
17	Do	254	9 do	pekoe No 2	900	33
18	Do	256	2 do	sou	185	31
19	Do	258	2 do	pek fans	200	27
20	Mukeloya	260	10 hf-ch	bro pek	600	55
21	Do	262	9 do	pekoe	495	40
22	Do	264	13 do	pek sou	650	37
23	Tonacombe	266	11 ch	bro pek	1210	57
24	Do	268	19 do	pekoe	1805	49
25	Do	270	11 do	pek sou	990	39
26	Do	272	4 do	sou	360	35
27	Do	274	1 do	bro tea	100	33
28	Do	276	3 do	dust	240	28
29	D D, r in estate mark	278	2 do	bro pek	200	47 bid
30	Do	280	1 do	pekoe	100	39
31	Do	282	7 do	pek sou	700	34
32	Do	284	1 do	dust	122	26
33	Do	286	1 do	bro tea	60	28
34	Luccombe	288	61 do	bro or pek	5490	43 bid
35	Do	290	70 do	pekoe	6300	36 bid
36	Do	292	46 do	pek sou	4140	31 bid
37	Do	294	5 do	pek fan	450	28
	(The Yataderia Tea Company, Limited.)					
38	Yataderia	296	11 do	bro pek	1177	51
39	Do	298	18 do	pekoe	1674	39
40	Do	300	12 do	bro pek	1308	51
41	Do	302	36 do	pekoe	3600	40
42	Do	304	12 do	pek sou	1080	35
43	Ingiriya	306	9 do	pekoe	900	41
44	Do	308	1 hf-ch	pek sou	50	40
45	Do	310	1 do	dust	50	29
46	V O	312	3 ch	dust	336	27
47	Do	314	3 do	bro tea	330	25
48	I G	316	5 do	sou	450	34
49	Do	318	1 do	bro tea	120	28
50	Kerrimettia	320	2 do	bro tea	208	36
51	Do	322	3 do	bro mix	312	36
52	Do	324	1 do	dust	144	29
53	H	326	10 hf-ch	unas	500	31
54	N, in estate mark	328	19 do	dust	1425	28
57	Muligusseny	334	2 do	bro tea	222	28
58	Do	336	3 do	dust	429	28
59	H S	338	9 do	pekoe	900	28
60	Do	340	2 hf-ch	sou	100	32
61	Do	342	1 do	dust	65	27
62	P A W T	344	1 do	bro mix	57	31
63	Do	346	2 ch	dust	200	28
64	Do	348	1 hf-ch	red leaf	61	29
65	Attsbage	350	4 do	pek fans	300	30
66	Do	352	4 do	bro mix	180	29
67	B & D	354	1 ch	green tea	133	25
68	Palamcotta	356	3 do	red leaf	300	27
69	Do	358	3 hf-ch	dust	240	29
70	P A W	360	6 do	dust	492	28
71	Do	362	3 do	pek dust	248	28
72	Do	364	2 do	dust	144	27
73	Do	366	4 ch	red leaf	400	28
74	Dehiowita	368	13 do	bro pek	1365	51
75	Dehiowita	370	21 ch	pekoe	2100	39
76	Do	372	13 do	pek sou	1235	36
77	Winsley	374	7 hf-ch	bro or pek	350	53
78	Do	376	9 do	pekoe	450	43
79	Bagatelle	378	6 do	bro or pek	330	50
80	Do	380	9 do	pekoe	450	43
81	Do	382	1 do	dust	52	28
82	Berragalla	384	2 ch	bro tea	166	39
83	Aldie	386	9 do	pek sou	810	42
84	Do	388	3 do	dust	300	29
85	Mousakande	390	10 do	bro pek	1000	52
86	Do	392	12 do	pekoe	1080	39
87	Do	394	5 do	pek sou	450	36
88	Radella	396	35 ch	bro pek	3500	52
89	Do	398	30 do	pekoe	2400	40
90	Do	400	27 do	pek sou	2160	37
91	A A, in estate mark	402	1 do			
			2 hf-ch	pekoe	228	26
92	Do	404	4 ch			
			4 bf-ch	red leaf	594	21
93	H	406	3 do			
			1 box	bro pek	137	30
95	H	410	3 ch			
			1 bf-ch	pek No 1	306	28
96	H	412	3 ch	sou	242	27
97	H	414	1 do	fans	81	2 8
98	H	416	1 bf-ch	red leaf	50	28_5
99	Harangalla	418	36 ch	bro pek	3600	5_2
100	Do	420	39 do	pekoe	3705	4_7
101	Do	422	29 do	pek sou	2610	3
105	Chestrford	430	19 do	bro pek	1140	4^5 bid
106	Do	432	28 do	pekoe	1400	3^9 bid
111	Deemally	442	10 do	bro or pek	500	5^4 bid
112	Do	444	24 ch	unas	2400	3^8 bid
113	Do	446	1 do	sou	88	3^2
114	Elfindale	448	88 hf-ch	bro pek	4400	4^9
115	Do	450	87 do	pekoe	3480	3^9
116	Do	452	35 do	pek sou	1400	3^6
117	Portmore	454	66 ch	bro pek	7260	5^7 bid
118	Do	456	27 do	pekoe	2700	4^4 bid
119	P	458	2 do	fans	184	3^0
121	Avisawella	462	25 box	bro or pek	500	63 bid
122	Do	464	15 ch	bro pek	1500	50 bid
123	Do	466	14 do	pekoe	1260	41
124	Do	468	38 do	pek sou	3420	38
125	Do	470	4 do	sou	420	31
126	Do	472	3 do	bulk	315	32
127	Bandarapolla	474	40 hf-ch	bro pek	2000	58
128	Do	476	32 do	pekoe	1600	38
129	Galawatte	478	4 do	red leaf	204	25
130	Do	480	3 do	pek dust	180	27
131	Laxapanagalle	482	2 do	red leaf	102	23
132	C F, in estate mark	484	24 do	bro pek	1200	72 bid
133	Do	486	41 ch	pekoe	3075	52 bid
134	Do	488	8 do	pek sou	600	41 bid
135	Do	490	1 hf-ch	sou	49	36
136	Do	492	1 ch	dust	120	32
137	R	494	3 do	dust	400	29
138	R	496	2 do	bro mix	180	23

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room today, 17th Dec., the undermentioned lots of Tea (83,625 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Yshala Kela	267	9 hf-ch	red leaf	450	28
2	L V	269	1 ch			
			1 hf-ch	dust	225	29
3	Do	270	8 ch	pek sou	720	34
4	Do	272	4 do	pekoe	360	35 bid
5	Do	274	35 do	bro pek	3500	45 bid
6	Whyddon	276	11 hf-ch	bro pek	605	54 bid
7	Do	278	4 ch	pekoe	440	42
8	Do	280	5 do	pek sou	500	37
9	Eilandhu	282	5 hf-ch	bro or pek	275	42
10	Do	284	21 ch	bro pek	1575	47
11	Do	286	18 do	pekoe	1350	37
12	Do	288	12 do	pek sou	900	34
13	Do	290	1 hf-ch	bro tea	50	25

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
14	Great Valley	10	40 ch	bro pek	4000	51
15	Do	12	24 do	pekoe	2280	40
16	Do	14	43 do	pek sou	3870	36 bid
17	Mocha	16	49 hf-ch	bro pek	2695	60
18	Do	18	18 do	dust	1620	28
19	H J R	20	13 ch	bro pek	1235	47 bid
20	Gonavy	22	29 do	bro pek	2900	63
21	Do	24	6 do	pekoe	540	46
22	Do	26	7 do	pek sou	630	43
23	Do	28	1 hf-ch	dust	75	29
24	Kadlenlena	29	28 ch	bro pek	2520	49 bid
25	Do	31	28 do	pekoe	2240	39 bid
26	Do	33	21 do	pek sou	1680	36
27	Do	35	1 do	dust	130	28
28	Do	36	10 do	unas	900	36 bid
29	B T	38	46 do	bro mix	4140	31
30	Albion	40	30 do	bro pek	3150	52 bid
31	Do	42	24 do	pekoe	2280	40
32	Do	44	16 do	pek sou	1472	35 bid
33	Do	46	3 hf-ch	dust	258	28
34	Orange Field P N R	47	6 do	bro pek	300	48
35	Do	49	27 do	pekoe	1215	37
36	Do	51	8 do	sou	400	27
37	Alnoor	53	1 do	bro or pek	50	44
38	Do	54	9 do	bro pek	450	46
39	Do	56	10 do	pekoe	500	36
40	Do	58	2 do	sou	100	30
41	Do	59	2 do	unas	80	31
42	Do	60	1 do	fans	60	30
43	Do	61	1 do	dust	65	23
44	Galkandewatte	62	28 ch	bro pek	2800	58
45	Do	64	34 do	pekoe	3060	49 bid
46	G K W	66	1 do	bro tea	90	28
47	Do	67	3 do	dust	240	27
48	Do	68	1 do	red leaf	100	7 bid
49	Manikwatte	69	19 do	bro pek	950	49
50	Do	71	14 do	pekoe	1330	39
51	Bittacy	73	20 hf-ch	bro pek	1200	53
52	Do	75	32 do	pekoe	1920	40
53	Hattangalla	77	17 ch	bro pek	1802	48 bid
54	Do	79	33 do	pekoe	3300	37
55	Do	81	14 do	pek sou	1372	34 bid
56	B, in estate mark	83	3 hf-ch	congou	180	32 bid
57	Do	84	1 do	dust	90	27
58	Elston	85	4 do	congou	200	24
59	Do	86	3 do	dust	210	26
64	Ayr	104	18 hf-ch	bro pek	810	55
65	Do	106	22 do	pekoe	880	39
66	Do	108	25 do	pek sou	1000	35
67	Do	110	3 do	congou	129	25
68	Do	111	2 do	pek fans	100	29
69	Do	112	2 do	pek dust	142	28
71	Lawrence	114	69 hf-ch	sou	3105	30 bid
72	Killaloo	116	36 ch	unas	3240	27 bid

Messrs. E. Benham & Co. put up for sale at the Chamber of Commerce Sale-room today, 17th Dec., the undermentioned lots of Tea (925 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Norton	33	4 hf-ch	pekoe	200	34 bid
2	Do	35	1 do	congou	45	28
3	W O	37	4 ch	fans	480	29 bid
4	Do	39	2 do	bro tea	200	26

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today 17th Dec., the undermentioned lots of Tea (57,097 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Glanrbos	1	4 ch	bro pek	380	45 bid
2	Do	2	15 do	pekoe	1275	38 bid
3	Do	4	9 do	pek sou	720	32
4	Do	6	2 do	congou	160	31
5	K	7	47 hf-cb	pek sou	2115	33
6	K	9	4 do	dust	260	27
7	D E C, in estate mark	10	5 do	red leaf	250	25
8	Do	11	1 do	fans	45	28
9	Carney	12	5 do	bro pek	375	50
10	Do	13	7 do	pekoe	350	36
11	Do	15	15 do	pek sou	750	33
12	A S C, in estate mark	17	4 hf-ch	fans	200	30
13	Do	18	1 do	unas	55	35
14	Do	19	1 do	dust	70	28
15	Do	20	2 do	red leaf	100	25
18	Nahalma	21	35 do	bro or pek	1925	51 bid
19	Do	23	3 ch	bro pek	270	40
20	Do	24	32 do	pekoe	3200	36
21	Do	26	2 hf-ch	congou	120	28
22	Do	27	1 do	dust	75	23
23	Comillah	28	12 hf-ch	bro pek	660	40 bid
24	Do	30	6 do	pekoe	300	36 bid
25	Do	32	9 do	pek sou	450	34
26	Do	34	1 do	dust	65	27
27	Brae	35	17 ch	bro pek	1700	42 bid
28	Do	37	20 do	pekoe	2000	33 bid
29	Do	39	5 hf-ch	dust	300	23
30	Agraoya	40	12 ch	bro pek	1200	48 bid
31	Do	42	1 do 1 hf-ch	pekoe	150	36 bid
32	Do	43	16 ch	pekoe No. 2	1600	32 bid
40	Bogahagodawatte	63	4 do	bro pek	260	41 bid
41	Do	65	6 do	pekoe	300	33
42	Do	67	9 do	pek sou	585	23
43	Do	69	1 do	bro mix	68	24
44	Do	70	1 do	fans	65	23
45	Do	71	2 do	dust	144	27
46	K Y	72	9 do	bro pek	495	37 bid
47	M	74	8 do	or pek	355	54 bid
48	Nugagalla	76	11 do	bro or pek	550	58 bid
49	Do	78	28 do	pekoe	1400	45 bid
50	Do	80	4 do	dust	320	28
51	Horagoda	81	11 do	bro pek	605	47 bid
52	Do	83	30 do	pekoe	1500	39 bid
53	Do	85	10 do	pek sou	500	33
54	Do	87	1 do	dust	80	27
55	Do	88	1 do	red leaf	50	24
56	Harrow	89	20 ch	bro pek	2200	54 bid
57	Do	91	30 do	pekoe	3000	37 bid
58	Do	93	7 do	pek sou	700	34 bid
59	Do	95	5 do	bro tea	350	28
60	A G C	97	4 do	sou	354	25
61	Do	99	13 do	congou	1155	32 bid
62	Do	100	5 do	fans	452	23 bid
63	P P Y	45	1 hf-ch	bro pek	45	37 bid
64	Do	46	3 ch 1 hf-ch	pekoe	284	33 bid
65	Do	47	1 box	pek sou	24	30
66	Do	48	1 hf-ch	unas	61	28
69	Lavant	51	14 ch	bro pek	1400	43 bid
70	Do	53	32 do	pekoe	2560	35 bid
71	Do	55	1 do	dust	125	27
72	F, in estate mark	57	12 do	sou	960	31
73	H G A	59	6 do	pek sou	540	31
74	B A	61	7 do	bro mix	630	25
75	Do	63	1 do 1 hf-ch	red leaf	91	21
76	Relugas	73	23 do	bro pek	1265	55
77	Do	75	13 ch	pekoe	1430	39 bid
78	Do	77	17 do	pek sou	1700	33 bid
79	Do	79	1 do	dust	134	23

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 17th Dec., the undermentioned lots of Tea (63,269 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
1	I N G	88	6 ch	bro pek	600	54 bid
2	Do	89	5 do	bro mix	500	30 bid
3	Do	90	3 do	dust	347	29
4	R X	91	2 do	pek dust	280	28
5	Do	92	1 do	dust	129	27
6	Do	93	1 do	bro tea	120	28
7	Do	94	1 do	bro mix	120	27
8	K W P	95	13 do	bro pek	1300	51
9	Do	96	17 do	pekoe	1530	40 bid
10	Do	97	14 do	pek sou	1190	36 bid
11	Harmony	98	22 hf-ch	bro pek	1100	55
12	Do	99	27 ch	pekoe	2430	39
13	Do	100	6 do	pek sou	540	34
14	Do	1	3 hf-cb	pek fans	210	28
15	Do	2	3 do	bro mix	135	26
16	N B	3	30 do	bro mix	1650	30
17	Obertscy	4	5 do	bro pek	250	51
18	Do	5	6 do	pekoe	270	37

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
19	Chertsey	6	7 do	pek sou	280	36
20	Do	7	3 do	congou	120	31
21	Do	8	4 do	bro mix	180	28
22	Do	9	4 do	pek fans	200	31
23	Do	10	2 do	sou	80	31
24	S P R	11	1 ch	dust	140	28
25	Depedene	12	5 hf-ch	bro pek	250	53
26	Do	13	9 do	pekoe	450	38 bid
27	Do	14	10 do	pek sou	500	33
28	H D	15	16 do	bro tea	800	31
29	Do	16	1 do	bro mix	50	25
30	Do	17	1 ch	dust	100	28
31	Hatdowa	18	9 hf-ch	bro pek	450	40
32	Do	19	24 do	bro tea	1200	29
33	Do	20	2 do	congou	90	25
34	Aadneven	21	13 ch	bro pek	1300	58 bid
35	,,	22	17 do	pekoe	1530	40 bid
36	K M O K	23	2 do	dust	160	27
37	W	24	66 hf-ch	unas	3300	31
38	W	25	5 do	sou	250	28
39	Blairavon	26	15 ch	bro pek	1500	52
40	,,	27	17 hf-ch	pekoe	1530	38
41	,,	28	19 ch	pek sou	1710	34 bid
42	,,	29	1 do	bro mix	120	24
43	,,	30	2 do	dust	240	28
44	T N C	31	1 hf-ch	pek sou	53	30
45	,,	32	5 do	dust	450	28
46	Udaveria	33	3 ch	bro pek	300	48
47	,,	34	3 do			
			2 hf-ch	pekoe No. 1	400	32
48	,,	35	2 ch			
			3 hf-ch	do ,, 2	336	34 bid
49	,,	36	1 do	dust	50	27
50	Heatherton	37	3 do	bro tea	126	26 bid
51	,,	38	1 do	dust	79	25
52	Wishford	39	18 do	bro pek	1080	56
53	,,	40	17 ch	pekoe	1700	38 bid
54	,,	41	5 do	pek sou	490	34 bid
55	,,	42	1 do	dust	80	28
64	S	51	2 do	bro tea	200	24
65	Ovoca A T	52	18 hf-ch	bro pek	990	66 bid
66	,,	53	29 ch	pekoe	2900	47 bid
67	,,	54	14 do	pek sou	1400	39 bid
68	,,	55	11 do	bro tea	1210	26
69	E	56	2 do	dust	240	27
70	E	57	1 do	pek sou	75	32
71	H	58	4 do	bro tea	400	26 out
72	R	59	5 hf-ch	bro pek	274	41
73	R	60	9 ch	pekoe	868	34 bid
74	R	61	2 do	pek sou	270	30
75	D	62	1 hf-ch	pekoe	56	35 bid
76	Rosoueath	63	27 do	bro pek	1710	53
77	K	64	4 ch	pekoe	444	32 bid
84	Stinsford	71	2 ch	pek sou No. 2	200	28
85	,,	72	1 do	congou	112	30
86	,,	73	1 do	pek dust	125	27
87	X X X	74	2 do	bro pek	209	43
88	,,	75	8 do	sou	928	27
89	,,	76	3 do	bro mix	300	27
90	,,	77	2 do	congou	168	24
91	C C	78	12 hf-ch	pekoe	624	35
92	Silverton	79	3 do	bro pek	195	40
93	,,	80	9 do	or pek	495	49
94	,,	81	15 do	pekoe	750	36
99	M	86	6 do	pekoe	585	out

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 17th Dec., the undermentioned lots of Tea (107,314 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	T C O	498	2 ch	sou	236	25
5	Fred's Ruhe	508	19 do	bro pek	950	49
6	,,	508	19 ch	pekoe	1900	37
7	,,	510	16 do	pek sou	1600	34
8	W A	512	8 hf-ch	bro pek	400	50
9	,,	514	8 ch	pekoe	800	35
10	,,	516	5 do	pek sou	500	32
11	,,	518	7 do	bro tea	840	31
12	,,	520	2 hf-ch	dust	190	27
13	Wallahandua	522	10 do	bro pek	650	51
14	,,	524	15 do	pekoe	825	41
15	,,	526	10 do	pek sou	500	38
16	S P A, in esate mark	528	2 do	bro or pek	170	30
17	,,	530	21 do	sou	1050	30
18	,,	532	1 do	fan	65	29
19	,,	534	2 do	bro mix	100	25
20	,,	536	3 do	bro tea	150	27
21	,,	538	1 do	unas	55	30
22	S P K	540	1 do	pekoe	55	31
23	Galkadua	542	19 do	bro pek	950	46
24	,,	544	18 do	pekoe	900	36
25	,,	546	20 do	pek sou	1000	33
26	Kirrimettia L M	548	16 do	bro pek	800	55
27	,,	550	42 do	pekoe	2100	37
28	,,	552	5 do	pek sou	250	32
29	,,	554	4 do	pek fan	300	27
30	Bowlane	556	28 ch	bro pek	2800	52 bid
31	,,	558	9 do	pekoe	830	39 bid
32	,,	560	15 do	pek sou	1315	35
33	F J G	562	9 hf-ch	unas	450	30
34	,,	564	2 do	sou	100	28
35	D C	566	9 do	bro pek	450	41
36	,,	568	9 do	pekoe	400	35
37	,,	570	14 do	pek sou	750	32
38	,,	572	1 do	congou	50	23
39	,,	574	1 do	red leaf	50	20
40	,,	576	2 do	dust	130	27
41	Kottiagalla	578	4 ch	bro pek	388	45
42	,,	580	15 do	pekoe	1500	35
43	,,	582	6 do	pek sou	600	31
44	,,	584	1 do	congou	100	23
45	,,	586	1 do	red leaf	100	24
46	,,	588	1 do	dust	161	26
47	G L, in estate mark	590	18 ch	bro pek	1890	49 bid
48	,,	592	14 do	pekoe	1260	35 bid
49	,,	594	3 do	pek sou	240	31
50	Debatgama	596	7 do	bro or pek	700	46
51	,,	598	7 do	pekoe	595	36 bid
52	,,	600	8 do	pek sou	640	34 bid
53	,,	2	1 do	do	70	30
54	,,	4	1 do	sou	80	25
55	,,	6	1 hf-ch	dust	70	28
56	Shrub's Hill	8	27 ch	bro bok	2700	48 bid
57	,,	10	25 do	pekoe	2125	45 bid
58	,,	12	30 do	pek sou	2550	33 bid
59	,,	14	1 do	sou	85	25
60	,,	16	1 do	dust	150	27
61	,,	18	1 do	red leaf	80	20
62	Nahaveena	20	48 hf-ch	bro pek	2160	48
63	,,	22	18 do	pekoe	720	42
64	,,	24	41 do	pek sou	2050	34
65	N A	26	3 do	dust	210	28
66	Blairgowrie	28	42 do	bro pek	2100	56
67	,,	30	16 ch	pekoe	1520	45
68	,,	32	11 do	pek sou	1015	37
69	,,	34	4 hf-ch	bro tea	160	27
71	Monrovia	38	6 do	bro pek	290	47
72	,,	40	9 do	pekoe	450	37
73	,,	42	7 ch	pek sou	700	34
74	,,	44	2 do	unas	200	33
75	,,	46	1 do	congou	100	26
76	,,	48	1 hf-ch	pk dust	75	27
77	E K	50	1 do	pekoe	50	32
78	,,	52	1 do	pek sou	50	29
79	Deaculla	54	8 do	or pek	480	72
80	,,	56	9 ch	pekoe	900	37 bid
81	,,	58	4 do	pek sou	400	33
82	,,	60	1 do	congou	100	28
83	,,	62	1 hf-ch	dust	70	27
84	B & D	64	3 ch	red leaf	330	25
85	,,	66	2 do	dust	320	26
86	Malvern	68	9 hf-ch	or pek	540	71
87	,,	70	12 ch	pekoe	1200	37 bid
88	,,	72	4 do	pek sou	400	33 bid
89	,,	74	1 do	congou	100	26
90	,,	76	1 hf-ch	dust	70	25
91	Atherfield	78	1 do	dust	80	27
92	,,	80	4 do	bro tea	200	29
93	,,	82	1 do	bro mix	50	27
94	Warwick	84	1 do	dust	85	28
95	,,	86	1 do	congou	50	31
96	Doouevale	88	11 ch	bro pek	1100	46
97	,,	90	23 do	pek sou	2070	35
98	B T N	92	1 do	sou	59	28
99	,,	94	1 do	dust	96	27
100	Midlothian	96	11 hf-ch	bro pek	660	53 bid
101	,,	98	12 ch	pekoe	1320	40 bid
102	G, in estate mark	100	1 do	pekoe	110	55
103	Gikiyana-knndc	102	5 hf-ch	dust	400	27
104	L, (in estate-mark	104	1 box	or pek	28	35
105	,,	106	1 hf-ch	pek sou	82	29
106	,,	108	1 do	do	42	26
107	B B B	110	2 ch	bro tea	140	23
	The Yataderia Tea Company, Limited.					
108	Yataderia	112	14 ch	bro pek	1540	50

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
109	Yatadería	114	22 do	pekoe	2200	39
110	„	116	6 do	pek sou	540	33
111	„	118	11 do	bro tea	990	28
112	Wavendon	120	2 ch	dust	300	28
113	Middleton	122	36 hf-ch	bro pek	2340	54 bid
114	„	124	12 ch	pekoe	1200	43 bid
115	Mukeloya	126	8 hf-ch	bro pek	480	50
116	„	128	9 do	pekoe	495	40
117	„	130	7 do	pek sou	350	36
118	„	132	1 do	dust	80	28
119	Donside	134	6 ch	sou	510	28
120	„	136	3 hf-ch	dust	210	27
121	V	138	3 ch	pekoe	240	29
122	V	140	2 do	pek sou	200	27
123	V	142	4 do	bro mix	360	24
124	Hatton	144	36 hf-ch	bro pek	1980	54 bid
125	„	146	34 do	pekoe	1598	41 bid
126	„	148	20 ch	pek sou	1700	36 bid
127	„	150	1 hf-ch	sou	50	35
128	„	152	2 do	dust	154	27
129	A	154	3 ch	pek sou	242	28
130	A	156	1 do	fans	84	27
131	Bon Accord	158	3 hf-ch	dust	225	28
132	„	160	2 do	fans	134	34
133	„	162	1 do	congou	42	26
134	Palmerston	164	4 do	bro pek	280	57
135	„	166	5 ch	pekoe	500	47
136	„	168	12 hf ch	do	720	49
137	„	170	4 do	pek sou	400	40
138	Patiagama	172	9 ch	bro pek	990	51
139	„	174	35 do	pekoe	3485	40
140	„	176	1 do	pek sou	100	32
141	„	178	1 do	red leaf	78	24
142	„	180	1 do	dust	150	27
143	H, in estate mark	182	4 hf-ch	or pek	200	40
144	„	184	9 do	pekoe	438	39
145	„	186	13 do	pek sou	657	35
146	H S, in estate mark	188	1 do	bro pek	65	40
147	„	190	2 do	pekoe	92	35
148	„	192	6 do 1 box	pek sou	290	32
149	Bismark	194	2 ch	dust	280	28
150	„	196	1 do	congou	90	30
151	„	198	1 do	unas	100	28
152	Needwood	200	1 do	bro tea	114	25
153	„	202	1 do	pek dust	160	27
154	„	204	3 do	dust	450	26
155	M B	206	1 ch	congou	100	27
156	„	208	2 hf-ch	dust	140	26
157	D E	210	1 box	or pekoe	30	47
158	„	212	2 hf-ch	bro pek	100	35
159	„	214	4 do	pekoe	180	30
160	„	216	1 do	bro mix	60	26
161	„	218	1 box	dust	30	28
	The Yatiyantota Tea Company, Limited					
162	Polatagama	220	32 hf-ch	bro pek	1920	55
163	„	222	51 do	pekoe	2550	44
164	„	224	60 do	pek sou	3000	37
165	Bellwood	226	4 do	red leaf	200	24
166	Penshurst	228	6 do	unas	330	35
167	Mahatenne	230	27 ch	pek sou	2700	35 bid
168	Putupaula	232	5 do	bro mix	600	25
169	Silver Valley	234	5 hf-ch	unas	250	31
107	St. Catherine	236	9 ch	bro pek	810	60
171	„	238	6 do	pekoe	540	40
172	„	240	5 do	pek sou	425	33
173	„	242	1 do	pek fans	90	30

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, November 28th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 28th Nov. :—

Ex "India"—Cocagalla (MCCCo.), 1b 12s; 1c 99s; 1b 96s; 1b 108s; 1 bag 92s; 2t 93s; 1b 89s; 1b 92s. Ravenswood 1t 104s; 1c 102s; 1b 98s; 1 bag 108s.

Ex "Sultana"—Sundry marks 1 bag 90s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 5th Dec. :—

Ex "Moyune"—Wiharagalla, 3c 109s; 8c 1b 107s; 1b 104s; 2c 1t 130s; 3c 96s 6d; 1t 87s; 3 bags 103s; 1 bag 94s.

Ex "Legislator"—Wiharagalla, 2c 1b 110s 6d; 8c 1t 107s; 8c 104s; 1c 99s; 2c 131s; 2c 1t 97s; 3 bags 104s; 1 bag 94s.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)

MINCING LANE, Dec. 5th, 1890.

Mark	Natural	Renewed	Root
	Stem		
Derry Clare	2¼d to 2½d	...	...
Morar	2½d to 3d	5½d to 6d	...
ST & LC, A	2d to 3d	4½d	...
EG in diamond	2d	3d to 5d	...
Adams Peak	2d to 2½d	3d to 3½d	...
Clydesdale	2d to 2½d	3d to 3½d	...
Sandringham	2d	4½d to 5d	...
AO	3d to 3½d	...	...
Hopton	2½d to 3d	3½d	...
Spring Valley	2½d	3½d	...
Glenalpin	...	6¼d to 6½d	...
Kolapatna	...	2½d	1¾d to 2d
Lynsted	3d	4½d	...
Ardlaw	2½d	3½d to 4d	2½d
Unugalla	1¾d to 2d	3d	...
Haloya	1¾d	...	...
	OFFICINALIS.		
ST & LC, A	4d to 4½d	...	...
„ B	3½d	4½d to 5d	...
E G in diamond	2½d	5½d	4d
A O	3d	4d to 4½d	5d
U. R. Y.	2¼d to 4d	3d to 8½d	...
Lynsted	4d to 4½d	6½d	...
Ardlaw	4d	7d	5½d

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Dec. 5th, 1890.

Ex "Sarpedon"—Gangwarily, 21 bags 105s; 4 67s; 4 60s.

Ex "Asia"—Crystal Hill, 20 bags 90s.

Ex "Manora"—Grange, 7 bags 100s.

Ex "City of Canterbury"—Gangaroowa, 17 bags 101s; 1 bag 60s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Nov. 28th, 1890.

Ex "Clan Fraser"—Wariagalla Mysore, 3 cases 2s 2d; 6 1s 7d; 3 1s 3d; 4 10d.

Ex "Amana"—(SD), 2 cases 1s; 2 1s 1d; 2 1s; 6 1s 1d

Ex "Scindia"—(A&Co.), 1 case 2s 2d; 2 2s 3d; 1 bag 2s 1d.

Ex "Cilarnum"—Maabar cardamom, 6 bags 1s 8d.

Ex "Austral"—Ferndale, Rangalla, 1 case 1s 10d; 2 1s 7d.

" CEYLON OBSERVER " PRESS, COLOMBO.

No. 2.] COLOMBO, JANUARY 14, 1891. PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 23rd Dec., the undermentioned lots of Tea (70,283 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	D E	118	4	ch	dust	360	29
2	Blackburn	119	1	do	dust	130	28
3	Do	120	3	do	pek sou	330	32
4	Do	122	10	do	pekoe	1000	37
5	Do	124	7	do	bro pek	770	44 bid
6	Deeside	126	27	do	bro pek	2700	55 bid
7	Do	128	42	do	pekoe	3780	41 bid
8	Do	130	1	do	congou	100	32
9	Do	131	1	hf-ch	dust	85	28
10	Mocha	132	36	do	bro pek	1980	59
11	Do	134	20	ch	pekoe	2000	
12	Do	136	12	do	pek sou	1140	39
13	Bollagalla	138	19	hf-ch	bro pek	1140	50
14	Do	140	13	ch	pekoe	1170	40
15	Do	142	21	do	pek sou	1890	34 bid
16	Kandenewra	144	18	do	pek sou	1620	36 bid
17	Killaloo	146	28	do	unas	2240	23 bid
18	D F, in estate mark	148	18	do	fan	1800	28
19	Tientsin	150	25	hf-ch	bro pek	1500	62
20	Do	152	24	ch	pekoe	2160	42
21	Do	154	1	do	fans	100	28
22	Do	155	1	do	dust	134	28
23	Kadienlane	156	26	do	bro pek	2340	54
24	Do	158	28	do	do	2520	53
25	Do	160	24	do	pekoe	1920	40
26	Do	162	28	do	do	2240	40
27	Do	164	19	do	pek sou	1520	35
28	Do	166	22	do	unas	1980	35
29	Do	168	1	do	dust	130	28
30	Alliady	169	7	do	bro pek	910	40
31	Do	171	6	do	or pek	660	32 bid
32	Do	173	5	do	pek sou	550	31 bid
33	P P	175	13	hf-ch	pekoe	691	33
34	Do	177	1	do	pek dust	56	25
35	Cruden	178	26	do	sou	1300	31 bid
36	Albion	180	40	ch	bro pek	4400	54
37	Do	182	39	do	pekoe	3744	40
38	Do	184	26	do	pek sou	2340	35
39	Do	186	3	do	sou	294	28
40	Do	187	3	do	dust	402	29
41	Do	188	1	do	red leaf	73	24
42	P T E	189	1	ch	fans	109	30
43	Do	190	1	do	dust	139	28
44	M R	191	1	do	pek fans	109	30
45	Do	192	1	do	dust	99	21
46	Do	193	1	do	dust	138	28
47	Madooltenne	194	12	do	bro pek	1320	46
48	Do	196	12	do	pekoe	1200	36
49	Do	198	12	do	pek sou	1200	31 bid

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 23rd Dec., th undermentioned lots of Tea (41,873 lb.), which sold at under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Urakande	82	2	ch	pekoe	200	
2	Do	83	4	do	pek sou	370	31
3	C A, in estate mark	84	2	hf-ch	unas	112	35
4	Do	85	3	do	bro mix	168	28
5	Do	86	1	do	dust	52	27
6	Madde	87	3	do	dust	270	26
7	Hiralouvah	88	5	do	bro pek	500	45 bid
8	Do	89	1	box	flowery bro pek	20	50
9	Do	90	9	ch	pekoe	900	38 bid
10	Do	91	8	do	pekoe A	785	37 bid
11	Do	92	1	box	flowery pek	20	33 bid
12	Do	93	7	ch	sou	693	31
13	Do	94	2	hf-ch	fans	122	29
14	Do	95	3	ch	red leaf	234	26
15	W W	96	7	ch	pekoe	690	33

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
21	Ederapolla	2	48	ch	bro pek	2400	48 bid
22	Do	3	41	do	pekoe	3690	35 bid
23	Do	4	16	do	pek sou	1410	32 bid
24	Do	5	2	do	sou	180	30
25	Do	6	3	do	bro tea	300	23
26	Do	7	1	hf-ch	pek dust	70	28
27	Naseby	8	12	do	bro pek	660	52 bid
28	Do	9	15	do	pekoe	815	45 bid
29	Narangoda	10	25	ch			
			1	hf-ch	unas	2550	36 bid
30	Do	11	4	do	congou	180	29
31	Do	12	1	do	dust	60	28
32	O	13	10	ch	sou	1150	28
33	O	14	5	do	congou	400	25
34	O	15	1	do	bro tea	120	25
35	H	16	3	hf-ch	bro tea	126	26
36	Ellakande	17	3	do	bro pek	165	71
37	Do	18	7	do	pekoe	350	44
38	Do	19	16	do	pek sou	720	37
39	Do	20	9	do	bro mix	450	29
40	Forest Hill	21	11	ch	bro pek	1100	53
41	Do	22	14	do	pekoe	1260	40 bid
42	Do	23	6	ch	pek sou	540	34 bid
44	P	25	5	hf-ch	pek sou	250	31 bid
45	P	26	4	do	sou	160	25 bid
46	P	27	2	do	congou	236	26
47	P	28	2	do	bro tea	140	24
52	Lyndhurst	33	8	ch	bro pek	800	49
53	Do	34	14	do	pekoe	1260	38
54	Do	35	18	do	pek sou	1630	32
55	Mapitigama	36	7	do	bro pek	700	48
56	Do	37	10	do	pekoe	900	37
57	Do	38	12	do	pek sou	1085	31

Messrs A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 23rd Dec., the undermentioned lots of Tea (60,474 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight. lb.	c.
1	Atoluwa	1	7	hf-ch	bro pek	385	32 bid
2	Do	3	7	do	pekoe	350	32
3	Do	5	7	do	sou	315	27
4	K	7	35	do	bro pek	2100	57
5	K	9	113	do	pekoe	5085	40
7	A S	13	4	do	bro pek	260	out
8	Kanangama	14	18	ch	bro pek	1890	35 bid
9	Do	16	13	do	pekoe	1235	35 bid
10	Do	18	24	do	do No 2	2280	32 bid
11	Do	20	25	do	pek sou	2250	29 bid
12	Agar's Land	22	44	hf-ch	bro pek	2200	55 bid
13	Do	24	25	do	pekoe	1250	44 bid
14	Do	26	40	do	pek sou	1800	35 bid
15	Do	28	49	do	sou No. 2	1960	30 bid
16	Do	30	10	do	sou	450	31 bid
17	Do	32	6	do	or pek dust	390	30
18	Do	34	2	do	dust	150	28
19	Woodend	35	19	ch	bro pek	2090	48
20	Do	37	19	do	pekoe	2090	37
21	Do	39	8	do	pek sou	790	32 bid
22	Do	40	1	do	dust	125	27
28	Hakarugalla	49	12	do	bro pek	1200	40 bid
29	Do	51	12	do	pekoe	1080	37
30	Do	53	5	do	pek sou	450	32
31	Do	55	2	do	congou	80	25
32	Do	56	2	do	dust	300	28
33	Kotagala	57	9	hf-ch	bro or pek	540	54
34	Do	59	22	ch	or pek	1980	44
35	Do	81	11	do	pek sou	990	35 bid
40	Horagoda	70	6	hf-ch	bro pek	330	50 bid
41	Do	72	14	do	pekoe	700	38 bid
44	K P W	76	13	ch	sou	1105	31 bid
45	Do	77	4	do	dust	280	28
46	Hapugalla	78	17	do	bro pek	1700	40 bid
47	Do	79	13	do	pekoe	1430	37 bid
48	Do	80	17	do	pekoe	1700	35
49	Engurra-kanda	81	14	do	bro pek	1400	43 bid
50	Do	82	32	do	pekoe	2560	34 bid
51	O M	83	12	hf-ch	bro pek	660	40 bid
52	Do	84	6	do	pekoe	300	36 bid
53	W	85	8	ch			
			1	hf-ch	pekoe	484	36
54	W	86	13	ch	sou	1155	20
55	W	87	5	do	bro pek sou	452	23

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 23rd Dec., the undermentioned lots of Tea (105,165 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	T	244	3 do	sou	300	28
2	T	246	4 do	bro mix	440	28
3	T	248	6 hf-ch	dust	480	29
4	Glendon	250	1 do	red leaf	54	25
5	Do	252	2 ch	pek dust	281	28
6	Do	254	1 do	dust	95	17
7	N P	256	8 do	sou	680	28
8	Do	258	5 do	dust	750	28
9	Do	260	6 do	dust	780	27
10	Do	262	17 do	red leaf	1360	26
11	S V	264	2 do	or fans	184	30
12	Do	266	1 do	pek fans	97	28
13	Do	268	1 hf-ch	bro mix	46	28
14	Do	270	1 ch	dust	74	27
18	Glenorchy	278	9 hf-ch	bro or pek	450	73
19	Do	280	12 do	bro pek	540	65
20	Do	282	26 do	pekoe	1170	56
21	Do	284	2 do	pek sou	100	43
22	R K	286	1 do	red leaf	50	27
23	Do	288	5 do	dust	375	28
24	Court Lodge	290	19 do	bro pek	1064	79
25	Do	292	16 do	pekoe	736	69
26	Do	294	16 do	pek sou	720	53
27	Do	296	1 ch	dust	141	30
31	S P S M	304	6 ch	bro pek	600	33
32	Do	306	5 do	pekoe	500	30
33	Do	308	4 do	pek sou	396	25
34	Do	310	1 do	dust	92	26
	The Yataderia Tea Company, Limited.					
35	Yataderia	312	16 ch	bro pek	1760	48
36	Do	314	25 do	pekoe	2500	38
37	Do	316	14 do	pek sou	1260	34
38	Do	318	13 do	bro pek	1430	48
39	Do	320	36 do	pekoe	3600	39
40	Do	322	12 do	pek sou	1080	34
41	Do	324	8 do	bro tea	720	28
42	Clunes	326	19 hf-ch	bro pek	950	40 bid
43	Do	328	49 do	pekoe	2205	35 bid
44	Do	330	13 do	pek sou	650	33 bid
45	N E	332	8 do	bro mix	440	27
46	L, in estate mark	334	1 do	dust	43	25
47	Thornfield	336	35 do	bro pek	2100	57
48	Do	338	30 ch	pekoe	3000	42
49	Do	340	3 hf-ch	pk dust	240	29
50	Maussakellie	342	22 do	bro pek	1320	54
51	Do	344	13 do	bro pek	715	51 bid
52	Do	346	32 ch	pekoe	3200	38 bid
53	Luccombe	348	43 ch	bro or pek	3870	45 bid
54	Do	350	51 do	pekoe	4590	36 bid
55	Do	352	37 do	pek sou	3330	32 bid
56	Do	354	4 do	pek fans	360	29
57	Alton	356	6 do	bro pek	660	57
58	Do	358	12 do	pekoe	1080	45
59	Do	360	4 do	pek sou	360	44
60	Do	362	5 do			
			1 hf-ch	fans	550	39
61	Do	364	7 ch	fans	700	39
62	Do	366	9 hf-ch	dust	675	28
	The Ceylon Tea Plantations, Co. Limited.					
63	Mariawatte	368	46 ch	or pek	4370	48 bid
64	Do	370	64 do	pekoe	5760	37 bid
65	Do	372	38 do	pek sou	3116	34 bid
66	Do	374	20 hf-ch	dust	1400	30
67	Dehiowitta	376	14 ch	bro pek	1470	48
68	Do	378	23 do	pekoe	2300	38
69	Do	380	11 do	pek sou	1045	34
70	Chesterford	382	19 hf-ch	bro pek	1140	48 bid
71	Do	384	28 do	pekoe	1400	37
72	Poolbank	386	28 do	or pek	1540	withd'n
73	Do	388	21 do	pekoe	1050	withd'n
74	Palamcotta	390	3 hf-ch	dust	255	27
75	Do	392	2 ch	red leaf	200	24
76	Angrowella	394	5 hf-ch	dust	425	29
77	M	396	1 ch	pek sou	100	32
78	Angroowella	398	17 hf-ch	bro pek	901	60
79	Do	400	39 do	pekoe	1950	45
80	Do	402	5 do	pek sou	250	37
81	Do	404	18 do	sou	810	29
82	Do	406	2 do	dust	170	29 bid
83	Norwood	408	9 ch	bro pek	900	49 bid
84	Do	410	16 do	pekoe	1440	40
85	H	412	2 do	congou	200	23
	The Talgaswela Tea Company. Limited.					
86	Talgaswela	414	25 ch	bro pek	2500	48
87	Do	416	5 do	pek sou	450	33

Lot No.	Mark	Box No.	Pkgs.	Description	Weight. lb.	c.
91	Bandarapolla	424	11 hf-ch	bro pek No 2	605	30
92	Do	426	30 do	bro pek	1500	52 bid
93	Do	428	38 do	pekoe	1900	45
94	Do	430	30 do	pek sou	1350	35
95	Do	432	5 do	dust	350	29

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 7th Jan., the undermentioned lots of Tea (68,166 lb.), which sol as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Yahalekelle	200	1 hf-ch	red leaf	50	28
2	Do	201	2 do	dust	150	26
3	M V	202	2 ch	red leaf	160	24
4	Handroo-kanda	203	2 hf-ch	bro pek	100	42
5	Do	204	4 do	pekoe	200	34
6	Do	205	4 do	pek sou	200	32
7	Do	206	1 do	dust	60	26
8	Do	207	1 do	red leaf	50	18
9	Esperanza	208	2 do	bro or pek	112	51
10	Do	209	10 do	or pek	500	64
11	Do	211	27 do	pekoe	1242	44 bid
12	Do	213	1 do	dust	92	25
13	Alnoor	214	2 do	bro or pek	100	51
14	Do	215	18 do	bro pek	900	49
15	Do	217	18 do	pekoe	900	38
16	Do	219	3 do	sou	150	33
17	Do	220	2 do	fan	120	31
18	H J R	221	16 ch	bro pek	1520	55
19	Do	223	25 do	pekoe	2000	41
20	Do	225	16 do	pek sou	1360	35 bid
21	Do	227	3 hf-ch	dust	240	27
22	Westhall	228	21 ch	dust and fans	2460	21 bid
23	Brownlow	230	33 do	bro pek	3465	59
24	Do	232	25 do	pekoe	2250	44
25	Do	234	20 do	pek sou	1700	40
26	B T	236	25 do	bro mix	2125	32
27	Do	238	1 do	dust	130	27
28	Dickoya	239	5 do	bro mix	535	25
30	Great Valley	242	26 do	bro pek	2600	55
33	Do	248	30 do	do	2700	38
34	Dunbar	250	25 do	bro pek	2500	54
35	Do	252	24 do	pekoe	2160	40
36	Anchor, in estate mark	254	18 hf-ch	bro pek	990	68
37	Do	256	28 ch	pekoe	2800	53
38	Do	258	20 do	pek sou	2 00	41
39	Madooltenne	260	12 do	pek sou	1200	36
40	E W	262	8 hf-ch	congou	400	32
41	Do	264	1 do	bro tea	55	35
42	L V	265	35 ch	bro pek	3500	38 out
43	Do	267	4 do	pekoe	360	35 out
44	G K W	269	1 do	red leaf	100	13
45	Devonford	270	5 do	pek sou	430	41
46	Do	272	1 do	dust	140	25
47	Maddegedera	273	36 hf-ch	bro pek	1944	53
48	Do	275	24 do	pekoe	1200	40
49	Do	277	18 do	pek sou	720	27
50	Do	279	1 do	sou	31	30
51	Do	280	4 do	dust	312	36
52	Labugama	281	4 do	bro or pek	200	53
53	Do	282	30 do	bro pek	1200	57
54	Do	284	53 do	pekoe	2120	43
55	Do	286	30 do	sou	1200	38
56	Do	288	19 do	pek fan	855	35
57	Do	290	6 do	red leaf	300	26
58	Do	10	5 do	congou	200	25
59	Do	11	3 do	pk dust	225	28
60	Do	12	1 do	unas	48	30
61	Logan	13	22 do	bro pek	1100	54
62	Do	15	19 do	pekoe	855	43
63	Do	17	33 do	pek sou	1485	39
64	Do	19	7 do	dust	420	28
65	Do	20	16 do	sou	720	36

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room, today, 7th Jan., the undermentioned lots of Tea (79,608 lb.), which sold as under :—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
1	A	1	7 hf-ch	bro pek	385	40
2	K G A	3	18 ch	bro pek	1890	49
3	Do	5	13 do	pekoe	1235	38 bid
4	Do	7	24 do	pekoe No. 1	2280	36
5	Do	9	25 do	pek sou	2250	35

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight. lb.	c.
6	Agraoya	11	11	do	bro pek	1100	48
7	Do	13	4	cb			
			1	hf-ch	pekoe No 1	450	38
8	Do	15	31	ch	pekoe No. 2	3100	34 bid
9	Do	17	2	do	dust	200	28
10	Nahalma	18	29	do	bro or pek	1595	54
11	Do	20	4	do	bro pek	200	40 bid
12	Do	21	27	do	pekoe	2700	41
13	Do	23	2	do	congou	110	30
14	Do	24	1	do	dust	75	27
15	Agraoya	25	9	do	bro pek	900	49 bid
16	Do	27	3	do	pekoe	300	39 bid
17	Do	28	18	do	pekoe No. 2	1800	36
18	Do	30	1	do	bro mix	100	24
19	Nahalma	31	38	hf-ch	bro pek	2090	54
20	Do	33	38	ch	pekoe	3800	38
21	Do	35	1	hf-ch	congou	86	29
22	Do	36	1	do	dust	75	28
23	Lavant	37	12	ch	bro pek	1200	50 bid
24	Do	39	23	do	pekoe	1840	38
25	Do	41	12	do	sou	960	35
26	Do	43	2	do	dust	250	27
27	F, in estate mark	44	10	do	sou	800	35
28	H H	46	4	hf-ch	bro pek	260	44
29	Do	47	1	do	unas	57	29
30	Do	48	4	ch	pek sou	380	36
31	Do	49	4	bf-c	bro mix	512	29
32	Penrhos	50	31	do	bro pek	1860	64 bid
33	Do	52	30	do	pekoe	1800	45 bid
34	Do	54	33	do	pek sou	1650	40
35	Do	56	5	do	bro tea	300	37
36	G H K, in estate mark	57	11	do	bro pek	550	47
37	Do	59	13	do	pekoe	585	37 bid
38	Do	61	11	do	pek sou	495	35
39	Do	63	4	do	congou	160	27
40	Do	64	1	do	pek fans	60	29
41	Yarrow	65	13	do	bro pek	832	56 bid
42	Do	67	18	do	pekoe	1080	47
43	Do	69	9	do	pek sou	504	37
44	M K	71	1	do	unas	40	32
45	P H	72	24	ch	bro pek	2400	53 bid
52	Relugas	86	41	do	bro pek	2255	51
53	Do	88	17	do	pekoe	1870	40
54	Do	90	19	do	pek sou	1900	36
55	Do	92	1	hf-ch	dust	153	27
56	Mohedin	93	3	do	bro pek	150	54 bid
57	Do	94	5	do	pekoe	205	39
58	Do	95	2	do	fans	75	32
59	Do	96	7	do	pek sou	301	36
60	Do	97	1	do	congou	50	25
61	Do	98	1	do	red leaf	44	27
62	Do	99	1	do	pek dust	42	26
69	P G A	26	5	do	bro mix	500	26
70	Do	29	3	bf-cb	dust	210	29
71	Lavant	32	14	ch	bro pek	1400	51
72	Do	34	32	do	pekoe	2560	37
73	A G C	38	1	do	congou	100	22
74	Do	40	5	do	bro tea	420	21
75	Do	42	20	bf-ch	dust	1400	25
76	Yaha Ella	2	23	do	bro pek	1150	51
77	Do	45	21	do	pekoe	945	37 bid
78	N O	85	12	do	bro pek	660	38 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 7th Jan. the undermentioned lots of Tea (130,395 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	H & H	434	1	ch	bro mix	120	29
2	S K	436	4	hf-ch	dust	296	28
3	Do	438	2	do	congou	112	36
4	Lagalla	440	2	do	dust	163	28
5	Do	442	3	do	bro mix	150	22
6	Gikiyanakande	444	1	do	dust	80	26
7	St. Catherine	446	8	ch	bro pek	720	51
8	Do	448	5	do	pekoe	450	37
9	Do	450	5	do	pek sou	425	36
10	M	452	4	hf-ch	bro or pek	220	46
11	M	454	5	do	pekoe	250	38
12	M	456	5	do	pek sou	225	34
13	M	458	1	do	bro pek fans	61	29
14	Laxapanagalla	460	3	do	pek fans	180	27
15	Do	462	2	do	dust	120	25
16	Macaldeniya	464	17	do	bro pek	918	55
17	Do	466	10	do	pekoe	473	40
18	Do	468	11	do	pek sou	1044	37
19	Do	470	1	do	sou	100	33
20	Do	472	1	do	dust	70	28
21	Do	474	1	do	red leaf	23	25
	The Ceylon Tea Plantations Company, Limited.						
22	Sembawatte	476	26	ch	bro pek	1950	49
23	Do	478	50	do	pekoe	2500	38
24	Do	480	9	do	pek sou	468	35
25	K H L	482	6	do	bro mix	540	25
26	L G E	484	17	hf-ch	or pek	935	43
27	Do	486	8	cb	pekoe	800	35
28	Do	488	3	hf-ch	dust	255	27
29	Tonacombe Uva	490	9	ch	bro pek	990	55
30	Do	492	11	do	pekoe	1040	42
31	Do	494	8	do	pek sou	720	38
32	Do	496	2	do	sou	180	33
33	Do	498	4	hf-ch	dust	320	27
34	Chesterford	500	18	do	bro pek	1080	54
35	Do	502	19	do	pekoe	950	37
36	Galkadua	504	25	do	bro pek	1250	51
37	Do	506	24	do	pekoe	1200	37
38	Do	508	25	do	pek sou	1250	33
39	Riseland	510	3	ch	bro pek	300	45
40	Do	512	11	do	pekoe	990	36
41	Do	514	4	do	bro pek sou	260	28
43	B E R	518	10	do	or pek	900	47
44	Do	520	2	do	bro pek	180	29
45	Do	522	16	do	pek sou	1600	31
46	Do	524	2	do	sou	180	25
47	Do	526	2	do	dust	280	30
48	H S	528	3	do	pekoe	240	35
49	Do	530	3	do	pek sou	282	34
50	Do	532	4	do	sou	354	24
51	Do	534	1	do	unas	100	24
52	Do	536	2	bf-ch	bro mix	100	26
53	Do	538	3	do	bro tea	150	24
54	Do	540	2	do	red leaf	100	25
55	C B	542	5	do	dust	400	28
56	Do	544	9	cb	bro sou	900	42
57	Do	546	1	hf-ch	red leaf	50	27
58	Middleton	548	41	do	bro pek	2665	62
59	Do	550	11	ch	pekoe	1100	48
60	Rambodde	552	12	hf-ch	bro pek	660	60
61	Do	554	15	do	pekoe	750	49
62	Do	556	21	do	pek sou	1050	41
63	Do	558	1	do	dust	75	26
64	Do	560	1	do	congou	50	31
65	P D M	562	1	ch	congou	87	34
66	Do	564	1	do	dust	123	29
67	Melrose	566	44	hf-ch	bro pek	2640	53
68	Do	568	23	ch	pekoe	2327	40
69	Do	570	16	do	pek sou	1600	37
70	Do	572	3	do	congou	270	29
71	C R D	574	4	hf-ch	dust	248	28
72	Do	576	5	do	red leaf	275	24
73	B & D	578	3	ch	red leaf	330	23
74	Weyvelbena	580	17	do	bro pek	1615	54
75	Do	582	28	do	pekoe	2380	41
76	Do	584	6	do	pek sou	480	36
77	Do	586	2	hf-ch	dust	160	26
78	Farnham	588	21	do	bro or pek	1050	65
79	Do	590	25	do	pekoe	1125	44
80	Do	592	60	do	pek sou	2700	37
	The Ceylon Tea Plantations, Co. Limited.						
81	Sembawatte	594	35	ch	bro pek	2625	49
82	Do	596	25	hf-cb	pekoe	1500	40
83	Do	598	16	ch	pek sou	1120	36
84	Malvern	600	12	do	pekoe	1200	42
	The Yatiyantota Tea Company, Limited.						
85	Polstagama	2	38	bf-ch	bro pek	1980	56
86	Do	4	55	do	pekoe	3190	43
87	Do	6	59	do	pek sou	2950	38
88	Abamala	8	24	do	bro mix	1320	36
89	Do	10	8	do	dust	640	27
95	Fetteresso	22	2	do	sou	180	35
96	Do	24	1	do	dust	135	27
98	W A	28	19	hf-ch	pekoe	1058	39
99	Do	30	6	cb	pek fan	469	31
100	Do	32	4	do	bro mix	380	24
101	H	34	3	cb	pekoe	315	32
102	Singleton	36	20	hf-ch	bro or pek	1160	53
103	Do	38	12	do	pekoe	648	42
104	Do	40	18	do	pek sou	900	39
105	Pallai	42	15	do	bro pek	675	30
106	Do	44	20	do	pekoe	800	30
107	Do	46	32	do	pek sou	1120	
108	Do	48	7	do	dust	490	

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.	
109	Avisawella	50	15	ch	bro pek	1500	55	
110	Do	52	13	do	pekoe	1170	40	
111	Do	54	36	do	pek sou	3240	37	
112	Do	56	5	do	bulk	525	36	
113	Do	58	3	do	dust	450	27	
114	Do	60	2	do	sou	210	29	
115	Avisawella	62	24	box	bro or pek	480	75	bid
116	Do	64	7	ch	bro pek	700	52	bid
117	Do	66	7	do	pekoe	630	41	
118	Do	68	15	do	pek sou	1350	37	
119	Do	70	2	do	sou	210	33	
120	Amblakande	72	11	do	bro or pek	1040	51	
121	Do	74	15	do	pekoe	1270	37	bid
122	Do	76	9	do	sou	790	32	bid
123	Do	78	3	do	bro mix	300	23	
124	H S, in estate mark	80	13	do	sou	1105	31	
125	Do	82	5	do	dust	700	25	
126	Queensland	84	3	do	pek fans	225	25	
127	Patiagama	86	9	do	bro pek	990	58	
128	Do	88	33	do	pekoe	3300	42	
129	Do	90	1	do	pek sou	100	35	
130	Do	92	1	do	dust	150	27	
131	S P	94	1	hf-ch	bro pek	50	63	
132	Do	96	3	do	pek sou	129	38	
133	Do	98	1	do	red leaf	40	29	
134	D C	100	3	ch	red leaf	330	26	
135	Do	102	3	do	bro mix	270	25	
136	Do	104	1	do	dust	160	26	
137	Bandara-polla	106	20	hf-ch	bro pek	1000	53	
138	Do	108	25	do	pekoe	1250	43	
139	Do	110	31	do	pek sou	1395	37	
140	Bandara-polla	112	29	do	bro pek	1450	53	
141	Do	114	33	do	pekoe	1650	42	
142	Do	116	31	do	pek sou	1395	37	
143	B	118	32	do	bro mix	1600	30	
144	Glengariffe	120	5	ch	bro tea	500	39	
145	Do	122	2	hf-ch	dust	164	27	
146	Gonamotava	124	1	ch	fans	173	25	
147	Horagaskelle	126	6	hf-ch	bro pek	360	48	
148	Do	128	7	do	pekoe	383	37	
149	Do	130	16	do	pek sou	896	35	
150	Do	132	1	do	congou	53	25	
151	Do	134	2	do	bro mix	150	25	
152	K	136	1	ch	dust	160	28	

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)
MINCING LANE, December 12th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 12th Dec. :—

Ex "Gaekwar"—Gordon, 1b 105s; 2c 1b 103s; 3c 100s 6d; 1b 96s.

Ex "Legislator"—Meddecombra, 2c 1b 112s 6d; 8c 1b 110s; 3c 1t 106s; 1b 98s, 1c 1b 134s 6d; 1c 99s; 2 bags 104s; 1 93s. Berragalla, 3c 110s; 6c 97s; 1c 1b 102s; 1c 130s; 1c 1b 98s; 1t 95s; 2 bags 105s. Gonamotava, 1b 103s; 2c 102s; 1b 126s; 1b 96s 6d.

Ex "Manora"—North Matale, 2c 104s; 3c 1b 101s 6d; 1c 99s; 2b 103s 6d; 1b 97s 6d; 1 bag 100s.

Ex "Clan Fraser"—North Matale, 1b 97s 6d.

Ex "Legislator"—Kelburne, 11c 1t 107s; 1c 1b 99s; 6d; 3c 1b 96s; 3 bags 101s; 5c 1t 106s; 4c 1t 1b 105s 1b 97s; 1c 1b 1t 96s; 2 bags 99s 6d.

Ex "Clan Fraser"—Gonakelle, 1b 100s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 19th Dec.:—

Ex "Goorkha"—Blackwood, 3c 1t 109s; 5c 1b 104s 6d; 1c 1b 101s 6d; 5 bags 93s 6d; 1 102s.

Ex "India"—Fermoyle, 3b 101s. Forest Hill, 1b 1s 98s; 1b 100s; 1b 1c 1t 95s 6d; 1t 100s; 2b 1t 91s 6d; 1b 100s; 2b 1t 99s 6d; 1b 1 bag 100s; 2 bags 88s.

Ex "Oroya"—Kotiyagalla, 1c 1b 107s 6d; 1 102s; 1b 99s; 1b 95s.

Ex "Goorkha"—Palli, 3c 105s 6d; 5c 103s; 1c 102s 6d; 2c 100s 6d; 1c 1b 90s; 2 bags 99s 6d.

Ex "Capella"—Dambatenne, 2c 1t 106s 6d; 4c 1b 105s. Moonerakande, 1c 1t 108s.

Ex "Ballaarat"—Dambatenne, 3 bags 100s 6d.

Ex "Gaekwar"—Gordon, 1b 92s: 1b 95s; 1b 81s; 1b 93s.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)
MINCING LANE, Dec. 1th, 1890.

SUCCIRUBRA.

Mark.	Natural Stem.	Renewed.	Root.
Lanka Plantations Co., Ltd.	2½d	3 d to d	...
Meddecombra	2d	...	...
ST&LC, A in dia.	2d to 2½d	3½d to 4½d	...
„ S „	2½d to 3d	5d	3d
Glenalpin	2½d	...	2½d
Marangalla	1¾d	2½d	...
OCO in diamond	2d	...	...
Hopton	2½d	3d	...
Maskeliya	1¾d to 2d	...	...
Uva Estate	2¼d to 2½d	2¼d	...
Bearwell	2½d	...	...
Spring Valley	1¾d to 2d	2¾d to 3d	...
Elmshurst	2d	3½d to 4d	...
Hindugalla	3½d	5¾d to 6d	...
ECB, T in diamond	1¾d to 2d	4½d	...
CHLA „	2d to 2½d	4d	2d to 2½d
Tulloes	...	4d	...
Roeberry	3½d to 4d	...	...
Forest Hill	2½d	3d to 3½d	...
Deagalla	3½d to 4d	...	...
Park	...	8d	...
	OFFICINALIS.		
Eskdale	3d	6½d to 7½d	...
Lanka Plantations Co., Ltd.	...	7d to 7½d	...
Glenalpin	5½d	...	...
Diyagama	3d to 3½d	5d to 6d	...
WSB in diamond	3d to 3½d	5½d to 6d	6d
Park	...	6d to 8d	6d to 6½d
HCC in diamond	3d to 4d	4d to 6d	...
Dukinfield	3½d to 4d	8d	...
Coneygar	2½d	5½d to 6½d	...
Chapelton	2½d to 3d	...	3d

CEYLON CACAO SALES IN LONDON.

(From Our Commercial Correspondent.)
MINCING LANE, Dec. 12th, 1890.

Ex "Jumna"—Anniewatte, 20 bags 110s.

Ex "Moyune"—Suduganga, 15 bags 111s 6d; 6 73s 6d; 3 43s; 1 53s. Maousava, 14 bags 100s; 8 47s 6d; 5 99s 6d. Degolla, 10 bags 98s.

Ex "Gaekwar"—Gangwarily, 24 bags 111s; 4 bags 84s 6d.

Ex "Legislator"—Kallugalla, 13 bags 87s; 4 55s; Wariagalla, 5 bags 88s.

Ex "Clan Maclean"—Woodslee, 9 bags 78s; 7 52s; 1 24s. Kumaradola, 4 bags 83s; 2 76s 6d; 9 80s; 2 67s; 5 47s; 1 24s. Bulatwatte, 22 bags 100s 6d; 10 78s 6d. 2 65s; 2 47s; 9 31s; 2 66s.

Ex "Arabia"—(CC), 10 bags 65s.

MINCING LANE, Dec. 19th.

Ex "Oroya"—Warriapolla, 31 bags 115s; 5 94s; 8 70s; 10 43s; 3 60s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)
MINCING LANE, Dec. 12th, 1890.

Ex "Legislator"—Kitoomoola, 1 case 3s 2d; 2 2s 5d; 1 1s 9d; 1 1s 3d; 2 1s 8d.

Ex "Chollerton"—Gallantenne, 2 cases 2s 7d.

Ex "Land Carriage"—ALB. 2 cases 1s 6d.

Ex "Clan Cameron"—Elkadua, 31 cases 2s.

Ex "Ganges"—Delmar (OBEC), 2 bags 1 box 11½d.

Ex "Gaekwar"—(A&C), 2 cases 2s; 1 9d; 1 2s.

Ex "Britannia"—Gallantenne, 3 cases 3s 7d; 3 2s 2d.

Ex "Legislator"—Asgeria, 4 cases 1s 9d; 3 1s 4d; 3 1s 11d; 3 1s 11d; 3 1s 4d. Meddecombra, 8 cases 1s 6d; 2 1s 1d: 3 1s 4d; 1 11d; 1 1s 8d.

Ex "Land Carriage"—HWS, 1 case 1s 4d. QSBN 1 case 2s 4d.

No. 3.] COLOMBO, JANUARY 26, 1891. {PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 7th Jan., the undermentioned lots of Tea (55,010 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Doscription	Weight lb.	c.
3	Hattanwella	41	13 hf-ch	bro pek	650	57
4	Do	42	30 do	pekoe	1500	38
5	Do	43	2 do	pek sou	100	29
6	Do	44	1 do	dust	55	26
7	Wewesse	45	47 do	bro pek	2585	51
8	Do	46	50 do	pekoe	2750	39
9	Do	47	42 do	pek sou	2310	35
10	Do	48	6 do	sou	330	34
11	Do	49	6 do	dust	450	27
12	St. Andrews	50	24 hf-ch	or pek	1584	66
13	Do	51	40 box	or pek	800	63
14	Do	52	23 hf ch	bro pek	1495	48
15	Do	53	43 do	pekoe	2752	44
16	K P W	54	17 ch	pekoe	1530	43
17	Do	55	14 do	pek sou	1190	37
18	S	56	7 do	red leaf	676	26
19	S	57	4 hf-ch	dust	320	27
20	Kitulgalla	58	5 ch	bro pek	500	45 bid
21	Do	59	11 do	pekoe	880	out.
22	Do	60	4 do	sou	320	31
23	Do	61	1 do	pek dust	125	28
24	Hiralouvah	62	5 do	bro pek	500	55
25	Do	63	9 do	pekoe	900	44
26	Do	64	8 do	pekoe A	785	39
27	Depedene	65	8 hf-ch	bro pek	400	53
28	Do	66	14 do	pekoe	700	40
29	Do	67	21 do	pek sou	1050	33
30	H D	68	28 do	bro tea	1400	32
31	Do	69	1 do	dust	80	27
32	Do	70	1 do	bro mix	50	25
33	K G H	71	2 do	bro pek	100	39
34	Do	72	2 do	pekoe	100	32
35	Do	73	2 do	pek sou	88	32
36	Roseneath	74	22 do	bro pek	1540	51 bid
37	Do	75	13 ch	pekoe	1625	38
38	Do	76	14 do	pek sou	1750	36
39	Yahalatenne	77	6 hf-ch	bro pek	360	51
40	Do	78	6 ch	pekoe	540	38 bid
41	Do	79	10 do	pek sou	900	34
42	R X	80	2 do	bro mix	240	32
43	Do	81	2 do	bro tea	240	34
44	Do	82	3 do	pek dust	420	28
45	Do	83	1 do	dust	140	26 bid
46	I P	84	14 ch	bro tea	1260	27
47	D B G	85	4 hf-ch	fans	240	29
48	Do	86	7 do	bro mix	385	30
49	Do	87	3 do	dust	240	26
50	C T M	88	5 ch	bro mix	450	27
51	Do	89	2 hf-ch	dust	140	26
53	Forest Hill	91	6 do	pek sou	540	35
54	Do	92	1 do	dust	120	28
55	F	93	9 do	pekoe	900	27 bid
58	F	94	3 do			
			2 hf-ch	dust	590	26
57	Malgolla	95	48 do	bro pek	2640	51 bid
58	Do	96	56 do	pekoe	2800	41 bid
59	Do	97	84 do	pek sou	2880	37 bid
60	Do	98	13 do	bro tea	715	33
61	Do	99	7 do	red leaf	350	27
62	Hatdowa	100	6 do	bro pek	300	48
63	Do	1	14 do	bro tea	700	32
64	Do	2	7 do	bro mix	350	32
65	Do	3	1 do	oongou	50	27

Messrs. E. BENHAM & Co. put up for sale at the Chamber of Commorce Sale-room today, 14th Jan., the undermentioned lots of Tea (8,445 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	W O	41	3 ch	fans	405	30
2	Do	43	2 do	bro tea	190	29
3	Elston	45	21 do	bro pek	2400	58 bid
4	Do	47	35 do	pekoe	3110	44 bid
5	Do	49	26 do	pek sou	2340	38

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room today, 14th Jan., the undermentioned lots of Tea (86,240 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Pate Rajah	22	2 ch			
			1 hf-ch	bro pek	260	47
2	Do	23	1 ch	pekoe	90	36
3	Do	24	1 hf-ch	pek sou	50	34
4	Do	25	1 do	dust	70	26
5	Yahala Kela	26	13 do	bro pek	650	56
6	Do	28	12 do	pekoe	576	47
7	Do	30	11 do	pek sou	528	38
8	Do	32	9 do	unas	450	36
9	Do	34	3 do	dust	220	27
14	Alnoor	42	22 hf-ch	bro pek	1100	53
15	Do	44	24 do	pekoe	1200	41
16	Do	46	2 do	sou	100	35
17	Do	47	4 do	fans	240	30
18	Do	48	1 do	unas	61	36
20	Orange Field	51	4 ch	bro pek	400	52
21	Do	53	21 do	pekoe	1981	37
22	Do	55	4 do	sou	380	30
23	Great Valley	57	22 do	bro pek	2200	58
24	Do	59	12 do	pekoe	1135	45
25	Do	61	29 do	pek sou	2610	41
26	Gongalla	63	30 hf-ch	or pek	1500	52
27	Do	65	34 do	pek sou	1700	37
28	Madooltenne	67	20 ch	bro pek	2200	51
29	Do	69	20 do			
			1 hf-ch	pekoe	2060	40
30	Do	71	16 ch	pek sou	1600	36
31	Do	73	1 do	unas	75	25
32	Loonagalla	74	6 hf-ch	bro mix	360	36
33	Eilandhu	76	28 ch	bro pek	2100	51
34	Do	78	35 do	pekoe	2625	40
35	Do	80	4 do	pek sou	300	37
36	Do	82	2 hf-ch	dust	130	26
37	Eildon Hall	83	43 ch	bro pek	4016	58 bid
38	Do	85	40 do	pekoe	3179	50
39	Do	87	19 do	pek sou	1520	44
40	Do	89	2 do	dust	270	28
41	Do	90	1 do	bro tea	86	23
42	Whyddon	101	6 do			
			18 hf-ch	bro pek	1590	60
43	Do	102	6 ch			
			11 hf-ch	pekoe	1205	46
44	Do	104	5 ch			
			13 hf-ch	pek sou	1215	43
45	Do	108	2 do	bro tea	114	29
46	Do	107	2 do	dust	170	27
47	Eila	108	16 ch	bro pek	1600	49
48	Do	110	28 do	pekoe	2240	40
49	Do	112	27 do	pek sou	2160	37
50	Do	114	2 do	dust	250	26
51	Brownlow	115	24 do	bro pek	2520	57
52	Do	117	18 do	pekoe	1710	46
53	Do	119	13 do	pek sou	1170	41
54	Do	120	1 do	dust	115	27
55	B T	121	30 do	bro mix	2550	33
56	Logan	123	14 hf-ch	bro pek	700	56
57	Do	125	11 do	pekoe	495	45
58	Do	127	25 do	pek sou	1125	41
59	Do	129	5 do	red leaf	225	32
60	Sudugauga	130	8 do	sou	400	28
61	Do	132	2 do	red leaf	100	24
62	Wariapolla	133	18 do	sou	900	29
63	Do	135	4 do	red leaf	200	25
64	Albion	136	44 ch	bro pek	4840	58
65	Do	138	45 do	pekoe	4320	47
66	Do	140	32 do	pek sou	3040	42
67	Do	142	2 ch	dust	280	28
68	Ivies	143	22 hf-ch	bro pek	1100	52
89	Do	145	14 ch	pekoe	1210	42
70	Do	147	19 do	pek sou	1710	39
71	Do	149	2 do	dust	135	27
72	Do	150	1 do	red leaf	40	25
73	H J R	151	8 do	bro pek	760	52
74	Do	153	11 do	pekoe	880	43
75	Do	155	6 do	pek sou	510	38
76	Do	157	1 hf-ch	dust	80	27

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today 14th Jan., the undermentioned lots of Tea (88,151 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight. lb.	c.
1	Glanrhos	1	14	hf-ch	bro pek	770	55
2	Do	3	21	do	pekoe	1050	42
3	Do	5	38	do	pek sou	1710	37
9	Torrington	17	23	ch	bro or pek	2530	62
10	Do	19	39	do	bro	4290	51
11	Do	21	47	do	pek sou	4700	44
12	Do	23	33	do	pek sou	3300	40
13	Do	25	12	hf-ch	dust	960	28
14	Agra Oya	27	10	ch	bro pek	1000	50
15	Do	29	3	do	pekoe	300	42
16	Do	30	14	do	pekoe No. 2	1400	36
17	Do	32	1	do	unas	88	36
18	Do	33	1	hf-ch	bro mix	152	25
19	Do	34	2	ch	dust	227	27
20	Dambula-galla	35	15	do	bro pek	1500	49 bid
21	K P W	37	22	hf-ch	bro pek	1100	51
22	Do	39	36	do	pekoe	1620	44
23	Do	41	30	do	pek sou	1200	40
24	Do	43	8	do	sou	320	36
25	Do	45	2	do	dust	140	27
30	A S C	54	3	hf-ch	fans	150	25
31	Do	55	1	do	pek dust	60	25
32	Do	56	5	do	red leaf	234	28
33	Do	57	1	do	unas	50	35
34	D E C	58	7	do	red leaf	350	28
38	Lavant	65	10	do	bro pek	1000	30
39	Do	67	19	do	pekoe	1520	40
40	Do	69	12	do	pek sou	960	37
41	Do	71	2	do	dust	225	27
42	F, (in estate mark	72	9	do	sou	720	33
43	Do	73	2	do	unas	176	35
44	L	74	1	do	bro mix	80	30 bid
45	A G C	75	21	hf-ch	dust	1470	27
51	Nahalma	83	52	hf-ch	bro pek	2800	55 bid
52	Do	85	55	ch	pekoe	5500	39
53	Do	87	2	hf-ch	congou	170	31
54	Do	88	1	do	red leaf	60	24 bid
60	T Y C	94	13	hf-ch	bro bek	830	57 bid
61	Do	96	30	do	pekoe	1800	45 bid
62	Penrhos	98	6	do	congou	300	31
63	Do	99	8	do	dust	560	29
64	Do	100	1	do	pek dust	70	30
65	H W D	16	2	do	pekoe	100	36
66	Do	26	2	do	sou	80	32
67	Do	28	1	do	dust	70	27
68	Comillah		6	hf-ch	bro pek	330	48
69	Do		9	do	pekoe	450	39
70	Do		11	do	pek sou	350	37
71	Do		1	do	dust	65	26
72	H G A		21	do	bro pek	1325	52 bid
73	Horagoda		17	do	bro pek	935	52 bid
74	Do		13	do	pekoe	1950	40
75	Do		4	do	pek sou	350	37
76	Do		1	do	dust	75	25

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 14th Jan., the undermentioned lots of Tea (87,927 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.		Description.	Weight. lb.	c.
1	Benveula	4	7	hf-ch	red leaf	420	28
2	Do	5	5	do	dust	375	27
3	F T	6	2	ch	bro pek	180	68
4	Do	7	3	do	pekoe	270	51
5	T T	8	6	do			
			13	hf-ch	pekoe	772	35
6	X X	9	4	ch	pekoe	430	28
7	Diganakelle	10	12	hf-ch	bro pek	600	65
8	Do	11	4	do	pekoe	200	51
9	Do	12	20	do	pek sou	1000	50
10	Do	13	2	do	dust	150	28
11	Do	14	2	do	fans	130	34
12	Do	15	1	do	bro mix	50	33
13	G G	16	2	ch			
			1	hf-ch	pekoe	250	35
14	Kudaganga	17	5	do	bro pek	253	58
15	Do	18	4	do	pekoe	192	42
16	Do	19	2	do	pek sou	94	40
17	Do	20	5	do	sou	250	39
18	Do	21	4	do	bro tea	220	38
19	Do	22	2	do	congou	90	32
20	Do	23	5	do	unas	250	42

Lot No.	Mark	Box No.	Pkgs.		Description	Weight. lb.	c.
21	St. Andrews	24	14	do	or pek	924	67
22	Do	25	14	do	bro pek	910	53
23	Do	26	38	do	pekoe	2432	47
24	W S	27	7	do	pekoe	690	35
25	"	28	6	do	bro tea	600	28
26	P	29	1	do	dust	123	26
27	Kitulgala	30	5	do	bro pek	500	52
28	"	31	14	do	pekoe	880	41 bid
29	"	32	8	do	pek sou	640	36
30	Arslena	33	10	hf-ch	unas	500	35
31	"	34	6	do	dust	300	28
32	"	35	5	do	congou	250	27
33	Weregalla	36	23	ch			
			1	hf-ch	bro pek	2345	61
34	"	37	25	ch	pekoe	2125	43
35	"	38	30	do	pek sou	2400	39
36		39	1	do	sou	80	33
37		40	6	hf-ch	bro tea	300	35
38	"	41	2	do	dust	150	27
39	Allakolla	42	36	hf-ch	bro pek	2340	59
40	"	43	50	ch			
			1	hf-ch	pekoe	5310	44
41	"	44	24	ch			
			18	hf-ch	pek sou	3390	40
42	"	45	3	do	dust	255	26
43	Lyndhurst	46	13	ch	bro pek	1300	53
44	"	47	15	do	pekoe	1350	39
45	"	48	12	do	pek sou	1080	36
46	Mapitigama	49	5	ch			
			1	hf-ch	bro pek	560	51
47	"	50	8	ch	pekoe	736	39
48	"	51	8	do			
			1	hf-ch	pek sou	815	35
49	"	52	1	ch			
			1	hf-ch	dust	162	27
50	"	53	1	ch	red leaf	94	24
51	Heatherton	54	4	hf-ch	bro tea	168	30
52	"	55	1	do	dust	90	29
53	Roselsnd	56	36	box	or pek	648	56 bid
54	"	57	5	do	bro pek	95	49
55	"	58	2	hf-ch	bro pek	140	46
56	"	59	10	ch	pekoe	950	40 bid
57	"	60	14	hf-ch	pek sou	700	38
58	"	61	1	ch	sou	88	34
59	"	62	2	ch			
			1	box	unas	239	37 bid
60	"	64	1	hf-ch	pek fans	66	32
61	Dalguise	65	18	ch	bro pek	1800	56
62	"	66	40	do	pekoe	4000	41
63	"	67	10	do	pek sou	1000	38
64	"	68	1	do	bro mix	100	33
65	"	69	2	do	dust	300	27
66	C B	70	2	do	pek sou	168	37
67	"	71	6	do	fans	850	26
68	"	72	1	do	unas	122	30
69	H W	73	7	do	sou	700	27
70	"	74	6	do			
			1	box	unas	637	27
71	"	75	2	ch	pek sou	150	34
72	"	76	2	do	dust	310	26
73	G B	77	9	do	bro tea	900	31
74	"	78	13	do	dust	2015	26
75	E L	79	22	hf-ch	pek sou	990	40
76	Panmure	80	10	ch	bro pek	1100	60
77	"	81	16	do	pekoe	1680	43
78	"	82	12	do	pek sou	1200	40
79	"	83	1	do	pek dust	150	27
80	"	84	2	do	bro mix	220	25
81	Raxawa	85	12	do	bro pek	1320	55
82	"	86	12	do	pekoe	1200	45
83	"	87	22	do	pek sou	2200	40
89	W	93	13	do	sou	1155	25
90	P K W	94	17	hf-ch	bro pek	935	45 bid
91	"	95	8	ch	pekoe	800	38 bid
97	G G	101	6	do	bro mix	300	27
98	K M O K	103	1	ch	bro tea	90	34
99	"	104	2	do	dust	160	26
100	"	106	1	do	red leaf	100	22
101	Manickanda	107	8	hf-ch	bro pek	400	58
102	"	109	13	oh	pekoe	1050	41 bid
103	"	111	6	do	pek sou	530	37
104	E L K	113	29	hf-ch	pekoe	1550	40
105	M G	115	3	ch	sou	381	29
106	"	117	3	do			
			3	hf-ch	dust	673	27
107	Putlam	119	21	do		1155	31
108	K G H	121	1	hf-ch	bro pek	50	40
109	"	122	1	do	pekoe	50	34
110	"	123	3	do	pek sou	135	33
111	"	125	1	do	pek fans	50	29

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
112	O C	128	4 hf-ch	bro pek	232	47
113	,,	128	14 do	pekoe	680	39
114	,,	130	10 do	pek sou	520	35
115	,,	132	1 ch	sou	80	29
116	,,	133	1 do	fans	120	32
117	,,	134	2 do	bro tea	210	28
118	N B	136	21 hf-ch	bro mix	1155	29 bid
119	,,	138	16 do	unas	1600	35

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 14th Jan., the undermentioned lots of Tea (210,951 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Goomera	138	2 ch	dust	280	29
2	R	140	3 do	bro mix	270	24
3	S B R	142	2 do	dust	280	28
4	R	144	4 do	dust	584	28
5	R	148	4 do	red leaf	324	25
6	A M B	148	9 do	bro tea	720	29
7	Halpatenne	150	3 do	bro pek	300	53
8	,,	152	3 do	pekoe	300	40
9	,,	154	12 do	pek sou	1140	38
10	,,	156	2 do	sou	160	29
11	,,	158	1 do	pek fans	110	29
12	Wallahandua	160	12 hf-ch	bro pek	780	57
13	,,	162	20 do	pekoe	1100	44
14	,,	164	16 do	pek sou	800	38
15	S P A	166	26 do	sou	1300	35
19	Freds Rhue	174	16 hf-ch	bro pek	800	56
20	,,	176	19 ch	pekoe	1900	44
21	,,	178	17 do	pek sou	1615	38
22	W A	180	4 do	bro tea	480	37
23	,,	182	1 do	do	100	37
24	,,	184	1 do	dust	127	28
25	A Z	186	1 do	bro pek sou	100	27
26	Columbia	188	19 hf-ch	bro pek	1045	67 bid
27	,,	190	18 do	pekoe	810	56
28	,,	192	2 do	pek sou	90	39
29	,,	194	1 do	dust	75	29
30	Blairgowrie	196	56 do	bro pek	2800	59
31	,,	198	20 ch	pekoe	1900	44
32	,,	200	13 do	pek sou	1235	38
33	,,	202	5 hf-ch	bro tea	210	29
34	,,	204	1 do	dust	82	27
40	Radella	216	41 do	bro pek	4100	57
41	,,	218	34 do	pekoe	2720	44
42	,,	220	41 do	pek sou	3280	39
43	Portmore	222	68 do	bro pek	7480	62
44	,,	224	31 do	pekoe	3100	50
45	P	226	3 do	fans	237	30
46	P	228	1 box	dust	34	26
47	Caledonia	230	4 ch	bro pek	420	52
48	,,	232	10 do	pekoe	1000	41
49	,,	234	4 do	bro sou	380	35
50	Thornfield	236	36 hf-ch	bro pek	2160	58
51	,,	238	26 ch	pekoe	2600	45
52	,,	250	14 do	pek sou	1372	38
53	,,	242	3 hf-ch	pk dust	240	29
54	,,	244	1 ch	bro mix	100	27
55	Midlothian	248	27 hf-ch	bro pek	1620	57
56	,,	248	32 ch	pekoe	3520	42
57	,,	250	3 hf-ch	congou	165	28
58	,,	552	1 ch	dust	100	26
59	Becherton	254	6 do	bro pek	600	52
60	,,	256	3 do	bro pek	225	51
61	,,	258	21 do	pekoe	1995	40
62	,,	280	3 do	bro tea	261	30
63	,,	282	1 do	dust	104	26
64	,,	284	1 do	congou	75	26
65	L, in estate mark	266	1 hf-ch	pek sou	33	36
66	K V	268	1 ch	congou	90	28
67	,,	270	1 do	fans	100	31
68	Pantiya	272	2 do	bro tea	196	33
69	Pingarawa	274	1 do	bro tea	100	33
70	St. Catherine	276	8 do	bro pek	720	50
71	,,	278	6 do	pekoe	540	44
72	,,	280	5 do	pek sou	425	37
73	,,	282	1 hf-ch	pek fans	60	28
74	,,	284	1 do	red leaf	50	24
75	Yataderia	288	22 ch	bro pek	2420	55
76	,,	288	22 do	pekoe	2200	41
77	,,	290	13 do	pek sou	1170	38
78	,,	292	3 do	pk fans	300	28
79	,,	294	10 do	bro or pek	1800	55
80	,,	296	58 do	pekoe	5800	42
81	,,	298	12 do	pek sou	1080	38
82	,,	300	12 do	bro tea	1080	33
83	B & D	302	2 do	red leaf	216	25
	,,	304	4 do	dust	620	27

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
85	Atherfield	306	2 hf-ch	dust	160	27
86	,,	308	6 do 1 ch	bro tea	400	35
87	W	310	2 ch	sou	100	36
88	W	312	1 do	red leaf	55	23
89	W	314	1 do	dust	57	28
90	Theberton	316	33 ch	bro pek	3300	48
91	,,	318	22 do	pekoe	2200	39
92	,,	320	9 do	pek sou	900	36
93	Harangalla	322	5 do	bro pek	4500	53
94	,,	324	42 do	pekoe	3990	41
95	,,	326	42 do	pek sou	3780	38
96	Aldie	328	8 hf-ch	bro pek	440	68
97	,,	330	7 ch	pekoe	700	52
98	,,	332	6 do	pek sou	540	42
99	,,	334	3 do	sou	225	34
100	,,	336	1 do	dust	75	27
101	,,	338	2 do	dust	140	26
102	Clyde	340	16 do	bro pek	1696	54
103	,,	342	32 do	pekoe	3040	39
104	,,	344	5 do	pek sou	478	37
105	Doonevale	346	12 do	bro pek	1200	50
106	,,	348	12 do	pekoe	960	40
107	,,	350	19 do	pek sou	1805	37
108	Dehiowitta	352	21 do	bro pek	2205	55
109	,,	354	42 do	pekoe	4200	42
110	,,	356	18 do	pek sou	1710	37
111	,,	358	2 do	bro tea	240	31
113	C M	360	4 do	dust	540	28
113	,,	362	7 do	red leaf	525	23
114	,,	364	2 do	congou	200	26
115	,,	366	2 do	unas	218	32
116	L, in estate mark	368	7 do	bro tea	882	27
117	C, in estate mark	370	8 do	bro tea	1008	27
118	Monaco	372	4 do 1 hf-ch	dust	783	27
119	I G	374	1 ch	bro tea	118	27
120	G I	376	1 do	pekoe	83	40
121	Chestrford	378	20 hf-ch	bro pek	1200	53
122	,,	380	24 do	pekoe	1200	42
123	,,	382	28 do	pek sou	1400	37
133	our t Lodge	402	24 do	bro pek	1344	84
134	,,	404	20 do	pekoe	920	71
135	,,	406	22 do	pek sou	990	58
136	,,	408	1 do	sou	82	40
137	,,	410	2 ch	dust	280	29
139	Stisted	414	5 do	bro pek	280	69
140	,,	416	11 do	pekoe	616	51
141	,,	418	10 do	pek sou	500	41
142	,,	420	1 do	dust	60	26
143	Chalmers	422	18 ch	bro pek	1360	61
144	,,	424	70 do	pekoe	4200	46
145	,,	426	20 do	pek sou	1200	40
146	,,	428	6 do	unas	540	35
147	,,	430	2 do	dust	200	28
148	,,	432	2 do	bro mix	150	29
149	Elfindale	434	63 hf-ch	bro pek	3300	50
150	,,	436	195 do	pekoe	7800	40
151	,,	438	50 do	pek sou	2000	37
160	N. in estate mark	456	15 do	dust	1125	27
176	Giklyana-knnde	488	8 ch	bro pek sou	880	36
177	W H	490	3 hf-ch	bro pek	171	31
178	,,	492	7 do	pekoe	383	30
179	,,	494	7 do	pek sou	351	29
180	,,	496	7 do	fans	486	29
181	,,	498	13 do	dust	1094	27
182	St. Helier's	500	8 do	fans	640	30
183	O & D	502	17 do	bro pek	1020	72
184	,,	504	13 do	pekoe	650	53
185	,,	506	11 do	pek sou	550	45
186	,,	508	2 do	fans	128	37
187	,,	510	3 do	dust	258	29
188	Bismark	512	2 ch	dust	280	27
189	,,	514	1 do	congou	90	27
190	Kahagalla	516	13 do	pekoe	1209	44
191	W G	518	2 hf-ch	pek dust	160	27
192	C F, in estate mark	520	20 do	bro pek	1000	73
193	,,	522	28 do	pekoe	2100	50
194	,,	524	10 do	pek sou	750	42
195	,,	526	1 do	sou	80	33
196	,,	528	2 do	dust	230	28
197	,,	530	13 do	bro pek	650	73
198	,,	532	29 do	pekoe	2175	50
199	Galawatte	534	6 do	unas	300	35
200	,,	536	5 do	dust	300	26
201	Gompache	538	1 do	bro pek	46	44
202	,,	540	2 do	pekoe	80	35
203	,,	542	2 do	bro mix	84	29

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
204	Bandera-polla	544	1 do	bro pek No. 2	300	43
205	,,	546	21 do	bro pek	1050	58
206	,,	548	36 do	pekoc	1800	46
207	,,	550	30 do	pek sou	1350	39
208	,,	552	13 do	sou	585	35
209	,,	554	9 do	dust	576	28
210	Donside	556	6 ch	sou	510	32
211	,,	558	2 hf-ch	dust	140	26
212	Moralioya	560	11 do	bro or pek	575	50
213	,,	562	11 do	pekoe	550	39
214	,,	564	13 d6	pek sou	585	37
215	,,	566	2 do	dust	143	27
216	,,	568	1 do	bro tea	47	30

Messrs A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 21st Jan., the undermentioned lots of Tea (59,983 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	K	1	39 hf-ch	bro pek	2340	59
2	K	3	132 do	pekoe	5940	44 bid
3	K	5	66 do	pek sou	2970	39
4	K	7	55 do	do A	2475	38
5	K	9	6 do	dust	450	30
6	Kanangama	11	31 ch	bro pek	3255	49
7	Do	13	22 do	pekoe	2090	41
8	Do	15	24 do	do No 2	2280	38
9	Do	17	21 do	pek sou	1890	37
10	Star, in estate mark	19	14 ch	bro pek	1820	46 bid
11	Do	21	28 do	pek sou	3080	37
12	Do	23	29 do	bro mix	3770	32
13	Woodend	25	26 do	bro pek	2730	54 bid
14	Do	27	29 do	pekoe	2900	42 bid
15	Do	29	6 do	pek sou	570	37
16	Do	31	1 do	congou	96	29
17	Do	32	1 do	dust	135	28
18	Peru	33	4 do	bro pek	400	61 bid
19	Do	34	10 do 1 hf-ch	pekoe	1043	49 bid
20	Do	36	1 ch	pek sou	90	36
21	Do	37	1 hf-ch 1 box	pek dust	110	25
22	Do	38	1 do	red leaf	25	27
23	Nabalma	39	33 hf-ch	bro pek	2090	56
24	Do	41	77 do	pekoe	4235	40 bid
25	Do	43	2 do	congou	110	31
26	Do	44	1 ch	dust	75	28
27	Yaha Ella	45	17 hf-ch	bro pek	850	56 bid
28	Do	47	16 do	pekoe	720	40 bid
29	Do	49	1 do	bro mix	50	33
30	Do	50	1 do	dust	70	25
31	Kotagaalla	51	2 do	unas	120	36 bid
32	Do	52	2 do	sou	100	32
33	Do	53	2 do	dust	170	27
34	B U S, in estate mark	30	4 ch	congou	440	33
40	D	64	1 ch	bro tea	89	26
41	Bogahagoda-watte	65	4 hf-ch	bro pek	267	46
42	Do	66	5 do	pekoe	250	37
43	Do	67	8 do	pek sou	400	35
44	Do	68	5 do	bro mix	345	33
45	Do	69	2 do	fans	130	30
46	Do	70	1 do	dust	78	28
47	Nugagalle	71	11 bf-ch	bro or pek	550	62 bid
48	Do	73	26 do	pekoe	1300	47 bid
49	Do	75	2 do	pek sou	126	38
50	Do	76	1 do	dust	73	28

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 21st Jan., the undermentioned lots of Tea (120,679 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	D S	158	3 ch	unas	255	38
2	Great Valley	159	7 hf-ch	dust	560	27
3	Do	160	4 do	pk dust	280	29
4	Do	161	23 oh	bro mix	1955	29
5	Do	163	8 do 1 hf-ch	pek sou	761	40
6	Do	165	6 ch	pekoe	570	44
7	Do	167	6 do 2 hf-ch	bro pek	680	58
8	F, in estate mark	169	31 ch	fan	3100	31
9	Kurundu Oya	171	19 hf-ch	bro pek	1140	62 bid
10	Do	173	30 do	pekoe	1650	52
11	Do	175	26 do	pek sou	1430	40 bid
12	Do	177	1 ch	dust	95	31
13	F T	178	90 hf-ch	bro pek	4505	50
14	Do	180	23 ch	pekoe	1060	42
15	Do	182	24 do	bro pek	2140	38
16	Do	184	5 do	bro mix	381	33
18	Anchor in estate mark	186	11 hf-ch	bro pek	627	67
19	Do	188	15 ch	pekoe	1515	51
20	Do	190	21 hf-ch	pek sou	1008	43
21	Do	192	19 do	bro mix	1140	36
22	Do	194	9 do	dust	666	29
23	Do	195	5 ch	bro tea	526	30
24	Galkande-watte	196	33 do	bro pek	3300	57
25	Do	198	46 do	pekoe	4140	44
26	G K W	200	3 hf-ch	dust	240	28
27	Do	201	1 ch	bro tea	90	34
28	Mocha	202	48 hf-ch	bro pek	2640	63
29	Do	204	50 ch	pekoe	5000	55
30	Do	206	12 do	pek sou	1140	44
31	Tientsin	208	17 hf-ch	bro pek	1020	61
32	Do	210	12 ch	pekoe	10[illegible]	48
33	Do	412	16 do	pek sou	14[illegible]	42
34	Abbotsford	214	19 hf-ch	bro or pek	1140	42 bid
35	Do	216	44 ch	bro pek	4400	58 bid
36	Do	218	36 do	pekoe	3600	47 bid
37	Do	220	23 do	pek sou	2300	41
38	Do	222	9 do	bro mix	[illegible]	34
39	Do	224	6 do	pek dust	[illegible]	30 bid
40	Blackburn	225	9 ch	bro pek	990	54
41	Do	227	17 do	pekoe	1700	42
42	Do	229	4 do	pek sou	350	39
43	Do	231	1 do	dust	114	28
44	Gouravilla	232	6 do	pek sou	600	39
45	Do	234	4 do	bro mix	360	36
46	Do	235	2 do	dust	150	29
47	Lawrence	336	35 do	sou	3500	34
48	N	238	6 hf-ch	bro mix	330	25
49	Killaloo	240	62 ch	unas	5580	30
50	Do	242	32 do	do	2560	25
51	Agra Ouvah	244	42 hf-ch	bro pek	2100	58
52	Do	246	45 do	pekoe	2025	44 bid
53	Do	248	34 do	pek sou	1530	40
54	A V	250	2 do	bro pek fans	140	26 bid
59	Esperanza	258	1 do	bro or pek	71	49
60	Do	259	3 do	or pek	150	61
61	Do	260	9 do	pekoe	402	45
62	Do	262	1 box	sou	24	31
63	Do	263	1 hf-ch	dust	60	26
64	Faithlie	264	10 ch	bro pek	1100	60
65	Do	266	15 do	pekoe	1350	47
66	Do	268	13 do	pek sou	1170	40
67	Do	270	4 hf-ch	dust	300	31
68	Bittacy	271	29 do	bro pek	1740	61
69	Do	273	46 do	pekoe	2760	48
70	Tangapoo Totum	275	16 ch	pek sou	1440	37
71	Do	277	10 do	congou	900	34
72	Dickapittia	279	34 do	bro pek	3298	51
73	Do	281	23 do	pekoe	1955	41
74	Do	283	23 do	pek sou	1840	38 bid
75	Do	285	2 do	sou	138	35
76	Do	286	2 do	dust	266	28
77	B, in estate mark	287	5 hf-ch	congou	300	36
78	Do	289	2 do	dust	180	28
83	Kadienlena	15	32 do	bro pek	2880	59
84	Do	17	35 do	pekoe	2800	44
85	Do	19	28 do	pek sou	2240	40
86	Do	21	1 do	congou	100	33
87	Do	22	1 do	dust	130	29
88	Heathside	32	20 do	bro pek	2281	34 bid
89	Ayr	23	18 hf-ch	bro pek	846	60
90	Do	25	24 do	pekoe	960	45
91	Do	27	27 do	pek sou	1134	39
92	Do	29	3 do	congou	129	33
93	Do	30	2 do	fans	100	32
94	Do	31	1 do	dust	70	28
95	Agra Ouvah		11 do	congou	490	32 bid

Messrs. E. Benham & Co. put up for sale at the Chamber of Commerce Sale-room today, 21st Jan., the undermentioned lots of Tea (2,539 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	H H	2	5 oh	pek sou	475	38
2	Do	4	5 do	bro mix	650	31
3	Y D	6	3 do	fans	318	29
4	Do	8	2 do	dust	180	29
5	Do	10	1 do	bro mix	86	35
6	Elston	12	4 hf-ch	dust	280	26
7	Do	14	11 do	congou	550	36

"CEYLON OBSERVER" PRESS, COLOMBO.

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COLOMBO SALES OF TEA.

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 21st Jan., the undermentioned lots of Tea (86,613 lb.), which sold at under :—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	Blairavon	39	20	ch	bro pek	2000	54 bid
2	Do	40	22	do	pekoe	1980	41 bid
3	Do	41	27	do	pek sou	2130	38
4	Do	42	4	do	bro tea	480	27
5	Do	43	1	do	dust	120	27
6	Ederapolla	44	3	do	sou	270	35
7	Do	45	1	hf-ch	bro pek No. 2	70	41
8	Do	46	1	ch	pek No. 2	85	35
9	Do	47	2	hf-ch	bro tea	110	34
10	Do	48	3	do	dust	210	26
11	Harmony	49	24	do	bro pek	1200	60
12	Do	50	29	ch	pekoe	2610	43
13	Do	51	12	do	pek sou	1080	38
1	Do	52	5	hf-ch	pek fans	350	32
15	Do	53	3	do	bro mix	135	28
16	Wishford	54	24	do	bro pek	1440	60
17	Do	55	19	ch	pekoe	1900	43
18	Do	56	4	do	pek sou	392	39
19	Do	57	1	hf-ch	dust	80	28
20	Surrey	58	12	do	bro pek	660	53 bid
21	Do	59	17	ch	pekoe	1870	43
22	Do	60	18	do	pek sou	1800	38
23	Do	61	4	hf-ch	sou	160	31
24	Keenawatte	62	6	do	bro pek	300	50
25	Do	63	7	do	pekoe	383	41 bid
26	Do	64	16	do	pek sou	896	37 bid
27	Stinsford	65	3	do	bro pek No 2	150	51
28	Do	66	3	ch	pekoe No 2	300	49
29	Do	67	2	do	bro tea	201	26
30	Do	68	4	do	pek dust	535	27
31	M K A	69	14	do	pekoe	1150	43
36	T, in estate mark	74	11	do	unas	550	37
37	Do	75	2	do	mixed	116	28
38	Do	76	3	do	dust	228	28
39	M A H	77	9	ch	congou	810	31
40	Do	78	3	do	red leaf	300	24
41	Do	79	2	do	dust	260	26
42	Marymount	80	5	hf-ch	unas	250	37
43	D K	81	2	ch	pekoe	196	31
44	Do	82	3	do			
			3	hf-ch	bro tea	489	29
45	Modera	83	18	do	or pek	900	54 bid
46	Pangwille	84	8	do	bro pek	400	54 bid
47	Do	85	11	do	pekoe	550	39
48	R S L	86	5	box	bro pek	95	50
49	Do	87	2	ch			
			1	box	pekoe	239	38
50	Do	88	5	hf-ch	pek sou	250	29
51	P H	89	1	do	pek sou	39	33
52	Do	90	4	ch	sou	354	27
53	S L	91	1	hf-ch	dust	61	21
54	Depedene	92	12	do	bro pek	600	56
55	Do	93	27	do	pekoe	1350	42
56	Do	94	39	do	pek sou	1950	37
57	H D	95	75	do	bro tea	3750	35
58	Do	96	4	do	bro mix	200	29
59	Do	97	4	do	dust	400	28
60	Elchico	98	31	do	bro pek	1550	56
61	Do	99	20	do	pekoe	900	43
62	Do	100	21	do	pek sou	945	39
63	Do	1	2	do	dust	140	28
64	Raxawa	2	10	ch	bro pek	1100	56
65	Do	3	7	do	pekoe	700	44
66	Do	4	16	do	pek sou	1600	41
67	Do	5	1	do	bro mix	120	31
68	Do	6	1	do	brotea	120	36
69	Do	7	3	do	pek dust	420	29
70	Do	8	1	do	dust	140	27
71	Yeletende	9	7	ch	bro pek	630	58
72	Do	10	12	do	pekoe	1020	44
73	Do	11	6	do	pek sou	510	38
74	Crurie	12	12	do	bro pek	1320	61
75	Do	13	16	do	pekoe	1520	43
76	Do	14	22	do	pek sou	1980	39
77	Do	15	5	do	sou	425	37
78	C T M	16	7	do	bro mix	630	29
79	Do	17	3	hf-ch	dust	210	28

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
80	Yahalatenne	18	7	hf-ch	bro pek	420	51
81	Do	19	8	do	pekoe	720	42
82	Do	20	6	do	pek sou	510	38
83	Do	21	2	do	bro mix	180	29
84	Do	22	1	do	dust	150	27
85	Narangoda	23	31	do	unas	3100	43
86	Do	24	2	ch	sou	190	36
87	Do	25	1	do	sou	45	36
88	Do	26	2	do	dust	130	29
90	A S P	28	4	hf-ch	bro pek	200	41
91	Do	29	7	do	pekoe	359	39
92	Do	30	5	do	bro tea	250	34
93	H A H	31	6	ch	pekoe	612	41 bid
94	K	32	2	do	pekoe	180	36
95	K	33	1	hf-ch	fans	46	31
96	K	34	1	do	congou	57	32
97	Hiralouvah	35	2	ch	sou	232	38
98	Do	36	1	hf-ch	unas	50	39
99	Do	37	1	ch			
			1	hf-ch	bro mix	147	33
100	H G A	38	1	ch	bro mix	130	33
101	Do	139	2	do	dust	300	27
102	Do	140	1	do	bro tea	105	30
103	Liskillen	141	1	do	dust	150	29
104	Ovoca A I	142	14	do	bro pek	1666	74
105	Do	143	17	do	pekoe	1700	58
106	Do	144	16	do	pekoe	1648	57 bid
107	Do	145	23	do	pek sou	2300	44
108	Do	146	20	hf-ch	bro mix	1220	36
109	Do	147	21	do	dust	1575	30
110	Do	148	2	ch	red leaf	226	29
111	Hatdowa	149	12	hf-ch	bro pek	600	50
112	Do	150	28	do	bro tea	1400	36
113	Jayella	151	11	do	bro pek	550	32
114	Do	152	13	do	pekoe	520	32
115	Do	153	42	do	pek sou	1470	30 bid
116	Do	154	28	do	dust	1725	25
117	C in estate mark	155	5	ch	fans	709	27
118	Do	156	6	do	sou	600	29
119	Friedland	157	9	hf-ch	sou	423	34
120	Do	158	10	do	congou	670	31
121	Do	159	4	do	red leaf	152	25
122	Do	160	3	do	dust	195	28
123	T N E	161	6	hf-ch	unas	336	40
124	S S	162	2	ch			
			7	hf-ch	red leaf	550	26
125	Do	163	3	do	dust	221	25

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 21st Jan., the undermentioned lots of Tea (182,736 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	Woodcote	572	1	ch	red leaf	85	31
2	C H	574	4	do	red leaf	191	29
3	G M, in estate mark	576	22	hf-ch	sou	1100	35
4	W F, in estate mark	578	20	ch	fan	1800	31
5	Duckwari	580	16	do	bro tea	1600	35
6	"	582	3	do	fans	384	32
7	Citrus	584	9	hf-ch	bro pek	540	59
8	"	586	32	do	pekoe	1731	41
9	"	588	13	do	pek sou	633	38
10	"	590	4	do	fans	257	31
11	Glenorchy	592	23	do	bro pek	1035	80
12	"	594	20	do	pekoe	900	57
13	"	596	1	do	dust	75	28
14	Bowlana	598	7	ch	bro pek	700	56
15	"	600	7	do	pekoe	665	43
16	"	2	11	do	pek sou	990	40
17	"	4	3	do	bro mix	255	29
18	Rickerton	6	12	hf-ch	dust	900	29
19	Sembawatte	8	57	hf-ch	bro pek	3135	51
20	"	10	40	do	pekoe	2000	41
21	"	12	9	ch	pek sou	810	38
22	Sembawatte	14	44	hf-ch	bro pek	2420	52
23	"	16	32	do	pekoe	1600	41
24	"	18	8	do	pek sou	416	28
25	"	20	37	do	pek fans (metal pkgs.)	2035	32
26	"	22	1	ch	unas	70	33

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
27	D C	24	10 do	bro pek	500	47
28	,,	26	10 do	pekoe	500	39
29	,,	28	22 do	pek sou	1100	37
30	,,	30	1 do	dust	60	27
31	,,	32	1 do	red leaf	50	24
32	,,	34	1 do	congou	50	30
33	W T	36	10 do	bro pek	500	58
34	,,	38	18 do	pekoe	900	44
35	,,	40	1 do	pek dust	65	27
36	D, in estate mark	42	8 hf-ch	bro pek	320	34
37	Alton	44	14 do	bro tea	630	39
38	,,	46	2 do	dust	150	28
39	Ismalle	48	62 do	bro pek	3410	55 bid
40	,,	50	29 ch	pekoe	2175	42
41	,,	52	1 hf-ch	pekoe	45	41
42	,,	54	21 ch	pek sou	1575	39
43	,,	56	7 hf-ch	dust	525	26
44	,,	58	2 do	bro mix	100	29
45	Polatagama	60	26 hf-ch	bro pek	1430	57
46	,,	62	39 do	pekoe	2145	45
47	,,	64	61 do	pek sou	3050	39
48	Abamalla	66	8 do	bro mix	480	36
49	,,	68	2 do	dust	170	29
50	Monrovia	70	7 do	bro pek	340	57
51	,,	72	13 do	pekoe	650	40
52	,,	74	12 ch	pek sou	1195	38
53	,,	76	4 db	unas	400	37
54	,,	78	2 do	congou	1 0	31
55	,,	80	1 do	dust	128	28
56	,,	82	1 hf-ch	red leaf	67	32
57	E K	84	1 do	pekoe	50	30
58	,,	86	1 do	pek sou	50	30
59	,,	88	1 ch	unas	81	28
60	Palawatte	90	2 ch	bro pek	200	53
61	,,	92	2 do	pekoe	172	41
62	,,	94	9 do	pek sou	810	38
63	,,	96	3 do	sou	210	31
64	,,	98	1 do	sou	50	34
65	,,	100	2 do	pek fan	224	30
66	Pasbage	102	5 hf-ch	bro mix	250	27
67	California	104	1 do	bro pek	50	58
68	,,	106	4 do	pekoe	160	40
69	,,	108	7 do	pek sou	350	39
70	Meddetenne	110	4 do 1 hf-ch	bro pek	450	55
71	,,	112	5 ch	pekoe	500	45
72	,,	114	8 do	pek sou	800	39
73	,,	116	1 do	dust	160	29
74	Frotoft	118	18 hf-ch	sou	900	47
75	,,	120	13 do	bro tea	750	42
76	,,	122	8 do	bro pek dust	640	32
77	,,	124	5 do	dust	400	23
78	Ukuwella	126	25 ch	bro pek	2625	54
79	,,	128	17 do	pekoe	1700	44
80	,,	130	15 do	pek sou	1425	40
81	,,	132	2 do	congou	200	33
82	,,	134	3 do	dust	225	29
83	C R D	136	4 hf-ch	dust	220	59
84	,,	138	2 do	red leaf	125	29
85	Pansaltenne	140	18 ch	bro pek	1890	60
86	,,	142	1 do	pekoe	1600	45
87	,,	144	15 do	pek sou	1425	40
88	,,	146	2 do	congou	200	35
89	,,	148	2 do	dust	225	29
90	Farnham	150	19 hf-ch	bro or pek	990	61
91	,,	152	22 do	pekoe	950	46
92	,,	154	56 do	pk sou	2520	40
93	,,	156	11 do	unas	495	39
94	,,	158	5 do	fanf	300	31
95	,,	160	2 do	dust	130	27
96	,,	162	3 do	bro tea	150	29
97	,,	164	1 do	mixed	45	23
98	Mariawatte	166	42 ch	or pek	3990	56
99	Do	168	80 do	pekoe	7200	43 bid
100	Do	170	52 do	pek sou	4264	40
101	Do	172	20 hf-ch	pek sou	860	38
102	Do	174	5 do	dust	700	29
103	Alton	176	10 ch	bro pek	1100	67
104	Do	178	15 do	pekoe	1350	53
105	Do	180	10 do	fans	1000	41
106	Do	182	8 hf-ch	dust	600	27
107	Do	184	4 do	bro tea No. A	180	29
108	Do	186	3 do	do No. U	198	32
109	Asgeriya	188	2 ch	bro tea	200	30
110	C, in estate mark	190	12 do	bro tea	1512	29
111	Dromoland	192	2 hf-ch	red leaf	63	26
112	Hope	194	1 ch	dust	126	24
113	Do	196	2 do	bro mix	220	39
114	Ingurugalla	198	8 do	sou	720	31
115	Do	200	7 do	bro tea	845	32
116	Koladenia	202	5 ch	bro tea	630	31

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
117	Kirrimettia	204	9 ch	bro mix	936	33
118	Do	206	7 do	bro tea	728	38
119	Do	208	1 do	dust	127	30
122	Yataderia	214	16 do	bro pek	1760	57
123	Do	216	40 do	pekoe	4000	42
124	Do	218	26 do	pek sou	2340	38
125	Do	220	3 do	bro tea	270	33
126	Do	222	12 do	bro tea	720	69
127	Do	224	6 do	pekoe	558	43
128	Do	226	20 do	bro pek	2200	58
129	Do	228	45 do	pekoe	4500	44
130	Do	230	25 do	pek sou	2250	39
131	Do	232	8 do	bro tea	720	34
132	Do	234	4 do	pek fans	420	31
133	Ingeriya	236	17 do	pekoe	1615	43
134	Do	238	1 hf-ch	pek sou	45	39
135	B G, in estate mark	240	1 ch	pekoe	100	36
136	Do	242	4 ch	pek sou	342	36
137	Do	244	3 ch 1 hf-ch	bro tea	360	30
138	Do	246	5 do	dust	300	27
139	Debatgama	248	2 do	fans	220	35
140	Do	250	1 do	congou	90	31
141	Do	252	1 do	dust	120	27
142	S P S M	254	2 do	bro pek	198	49
143	Do	256	1 do	pekoe	100	34
144	Do	258	1 do	pek sou	100	33
145	Silvervalley	260	7 hf-ch	pekoe	350	40
146	Do	262	1 ch 1 hf-ch	bro pek	124	32
147	Do	264	5 do	dust	378	28
148	Castlereagh	266	11 do	bro or pek	550	67
149	Do	268	34 do	pekoe	1710	52
150	K C, in estate mark	270	11 do	pek fan	550	37
151	Do	272	2 do	dust	170	28
152	Do	274	3 do	bro pek sou	150	34
153	Queensland	276	3 ch	pek fans	225	32
154	L W	278	16 hf-ch	or pek	960	67
155	Do	280	15 ch	pekoe	1500	45
156	Do	282	4 do	pek sou	400	37
157	Do	284	1 do	dust	70	25
158	Craighead	286	6 ch	sou	510	34
159	B W	288	12 do	bro pek	1260	59
160	B N	290	3 do	bro pek	225	53
161	E	292	16 do	bro pek	1200	52
162	A O	294	10 do	bro pek	1000	54
163	Kirimettia L M	296	16 hf-ch	bro pek	800	55
164	Do	298	49 do	pekoe	2450	41
165	Do	300	1 do	do No. 2	57	40
166	Do	302	6 do	pek sou	300	37
167	Do	304	6 do	pek fans	420	32
168	S C	306	8 ch	bro pek	720	54
169	C	308	10 do	pekoe	1000	43
170	Q	310	46 do	pekoe	4600	42 bid
171	M A	312	9 do	pek sou	815	36
175	H	320	33 ch	bro pek	3300	54
176	M N	322	20 do	pekoe	2200	42 bid
177	T	324	27 do	bro pek	2970	45 bid
178	Shrubs Hill	326	42 do	bro pek	2520	56
179	Do	328	24 do	pekoe	2400	42
180	Do	330	24 do	pek sou	2040	40
181	Do	332	1 do	sou	95	34
182	Do	334	1 do	dust	150	30
183	E D K E, in estate mark	336	3 box	red leaf	65	25
184	Angroowella	338	2 hf-ch	dust	160	29
185	Ancoombra	340	9 do	dust	724	30
186	Palamcotta	342	3 hf-ch	dust	255	30
187	Do	344	2 ch	red leaf	200	27
188	M	346	18 hf-ch	bro pek	1170	56
189	M	348	7 ch	pekoe	700	45
190	M	350	1 do	congou	108	33
191	P A W T	352	1 hf-ch	red leaf	50	25
192	Do	354	2 ch	dust	200	28
193	Wavedon	356	1 do	dust	150	29
194	Portmore	358	23 do	bro pek	2530	63
195	Do	360	12 do	pekoe	1200	50
196	P	362	1 do	fans	60	29
197	Mousakellie	364	26 hf-ch	bro pek	1430	56
198	Do	366	12 do	bro pek	720	54
199	Do	368	45 ch	pekoe	4500	43
200	Do	370	3 hf-ch	congou	165	35
201	Do	372	1 ch	dust	105	27
202	M P	374	5 hf-ch	bro pek	235	52
203	Do	376	4 do	pekoe	171	41
204	Do	378	10 do	pek sou	400	39
205	Do	380	1 do	bro mix	43	32
206	West Haputale	382	8 ch	sou	398	36
207	Do	384	7 do	unas	350	39

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
208	Avisawella	386	14 box	bro or pek	280	70
209	Do	388	16 ch	bro pek	1600	54
210	Do	390	16 do	pekoe	1440	42
211	Do	392	40 do	pek sou	3600	40
212	Do	394	5 do	unas	525	41
213	Do	396	3 do	dust	450	30
214	Do	398	3 do	sou	315	36
215	Theberton	400	3 do	pek dust	300	28
216	Do	402	3 do	red leaf	300	29
217	Do	404	2 do	congou	200	29
218	Bandara-pella	406	21 hf-ch	bro pek	1050	57
219	Do	408	31 do	pekoe	1550	45
220	Do	410	27 do	pek sou	1215	39
221	W G	412	1 do	pek fans	62	36
222	Do	414	1 do	pek dust	75	27
223	A D	416	17 do	bro pek sou	671	28

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 28th Jan., the undermentioned lots of Tea (93,599 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Sapu	418	2 ch	red leaf	170	29
2	Dodanduwa	420	2 hf-ch	unas	84	35
3	Weddigode	422	2 do	bro pek	100	53
4	Do	424	9 do	pekoe	450	39
5	Do	426	13 do	pek sou	650	38
6	Do	428	1 do	fans	50	35
7	Glasgow	430	3 do	dust	240	32
8	Do	432	1 ch	red leaf	100	32
9	Drayton	434	3 bf-ch	unas	150	41
10	Do	436	1 do	do	50	39
11	Do	438	2 ch	bro mix	140	26
12	Wallahandua	440	14 hf-ch	bro pek	840	62
13	Do	442	24 do	pekoe	1320	46
14	Do	444	28 do	pek sou	1400	43
15	S P A	446	1 do	pekoe	60	45
16	Do	448	25 do	sou No. 1	1250	38
17	L G E	450	19 do	or pek	1045	50
18	Do	452	6 ch	pekoe No. 1	600	43
19	Do	454	3 hf-ch	dust	255	28
20	Doonevale	456	1 ch	bro pek	100	51
21	Do	458	4 do	pek sou	380	39
22	Do	460	6 do	bro mix	660	30
23	Do	462	1 hf-ch	dust	68	27
24	Warwick	464	2 do	congou	90	39
25	Do	466	2 do	dust	160	30
26	N	468	1 ch 1 hf-ch	bro mix	170	28
27	Abbotsleigh	470	1 ch	congou	90	35
28	Sogama	472	11 hf-ch	pekoe	581	41
29	S S S	474	6 ch	pek sou	645	36
30	Do	476	3 do	red leaf	425	24
31	Do	478	1 do	bro tea	117	31
32	O	480	10 do	dust	1120	29
33	Do	482	6 do	bro tea	660	27
34	L, in estate mark	484	4 do	bro tea	504	28
35	Debatgama	486	7 do	bro or pek	700	54
36	Do	488	21 do	bro pek	2100	54
37	Do	490	7 do	pekoe	595	42
38	Do	492	20 do	pekoe	1800	42
39	Do	494	20 do	pek sou	1920	40
40	K V	496	2 do	congou	180	33
41	Do	498	1 do	fans	100	32
42	Yataderia	500	4 do	bro pek	240	63
43	Do	502	22 do	pekoe	2200	44
44	Do	504	25 do	pek sou	2250	41
45	Do	506	7 do	or pek	651	47
46	Do	508	14 do	sou	1400	37
47	Do	510	7 do	bro tea	630	35
48	Galkadua	512	12 hf-ch	bro pek	900	54
49	Do	514	24 do	pekoe	1200	39
50	Do	516	28 do	pek sou	1400	38
51	L H	518	8 ch	bro pek sou	800	29
52	Thornfield	520	20 hf-ch	bro pek	1200	66
53	Do	522	15 ch	pekoe	1500	50
54	Do	524	8 do	pek sou	784	42
55	Do	526	1 hf-ch	pek dust	80	31
56	Midlothian	528	30 do	bro pek	1950	70
57	Do	530	12 ch	pekoe	1200	56
60	P D M, in estate mark	536	2 do	congou	180	41
61	Do	538	2 hf- h	dust	160	30
62	L B K	540	6 ch	red leaf	600	30
63	B	542	21 hf-ch		1050	32
64	Gonaadika	544	3 do	red leaf	140	31
65	Mukeloya	546	8 do	bro pek	480	65
66	Do	548	18 do	pekoe	990	50
67	Do	550	11 do	pek sou	660	43
68	Do	552	1 do	dust	80	30
69	Polatagama	554	22 do	bro pek	1320	62
70	Do	556	45 do	pekoe	2250	48
71	Do	558	52 do	pek sou	2600	42
72	G	560	7 do	bro pek	420	55
73	G	562	19 do	pekoe	950	43
74	G	564	42 do	pek sou	2100	39
75	A	566	3 ch	bro pek	300	49
76	A	568	2 do 1 hf-ch	pekoe	250	37
77	B A	570	3 ch 1 hf-ch	pekoe	853	39
78	Nahaveena	572	12 do	bro pek	600	61
79	Do	574	9 do	pekoe	405	46
80	Do	576	14 do	pek sou	630	44
81	N A	578	15 do	pekoe	675	42
82	Do	580	2 do	dust	162	31
83	Palamcotta	582	47 do 1 box	pekoe	2364	42
84	Ancoombra	584	24 ch 1 hf-ch 1 box	bro pek	2757	61
85	Do	586	13 ch 21 hf-ch	pekoe	2 65	47
86	Angroowella	588	15 do 1 box	bro pek	818	66 bid
87	Do	590	3 hf-ch 1 box	pekoe	1832	49 bid
88	D	592	2 hf-ch 1 box	bro pek	141	46
89	D	594	6 hf-ch 1 box	pekoe	350	40
90	D	596	2 hf-ch	dust	131	29
91	D	598	3 do	red leaf	150	28
93	F F B	2	14 ch	bro pek	1400	53
94	Do	4	9 do	pekoe	900	41
95	Do	6	19 do	pek sou	1900	39
96	Riseland	8	2 do	bro pek	200	52
97	Do	10	6 do	pekoe	540	39
98	Do	12	2 do	bro pek sou	180	32
99	Do	14	2 do	bro mix	180	32
100	Do	16	1 do	unas	90	37
101	Do	18	3 box	or pek	36	10
102	Daphne	20	8 ch	bro pek	860	54
103	Do	22	11 do	pekoe	1180	40
104	Do	24	9 do	pek sou	900	39
105	C P H	26	6 hf-ch	bro pek	300	50
106	Do	28	4 do	pekoe	200	39
107	Do	30	9 do	pek sou	450	37
108	L	32	13 do	bro tea	650	38
109	Palmerston	34	7 do	dust	490	31
110	Cocogalla	36	17 ch	bro pek	1530	66
111	Do	38	12 do	pekoe	1080	51
112	Do	40	4 do	pek sou	360	41
113	Do	42	1 do	fans	100	34
114	St. Heliers	44	20 hf-ch	bro pek fans	1700	34
115	Clyde	46	6 ch	bro pek	636	58
116	Do	48	12 do	pekoe	1140	48
117	Do	50	4 do	pek sou	380	40

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 28th Jan., the undermentioned lots of Tea (71,125 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight. lb.	c.
1	Rondura	64	4 ch	red leaf	348	29
2	Do	65	1 do	dust	100	31
3	S, in estate mark	66	7 do	red leaf	612	31
4	Do	67	2 do	congou	156	33
5	Do	68	2 do	dust	200	31
6	A R	69	11 hf-ch	dust	880	31
7	Do	70	4 ch	bro mix	420	29
8	E	71	32 hf-ch	pekoe	1597	43
9	Wishford	72	2 ch	unas	207	38
10	G R	73	3 do	bro pek sou	219	30
11	D	74	2 hf-ch	bro pek	100	25
12	D	75	14 do	unas	700	39
13	Kuruwitty	76	8 do	bro pek	400	66
14	Do	77	5 do	pekoe	240	45
15	Do	78	12 do	pek sou	576	39

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
16	Do	79	2	do	sou	92	38
17	Do	80	3	do	bro tea	162	37
18	Do	81	1	do	congou	45	34
19	Do	82	1	do	dust	79	30
20	Wewesse	83	33	do	bro pek	1650	60
21	Do	84	45	do	pekoe	2250	45
22	Do	85	28	do	pek sou	1400	39
23	Do	86	7	do	sou	350	36
24	Do	87	3	do	dust	225	30
30	South Wana Rajah	93	12	ch	bro pek	1200	76 bid
1	Do	94	30	do	pekoe	3000	54 bid
2	Do	95	12	do	pek sou	1200	44 bid
33	Hattanwella	96	21	hf-ch	pekoe	1050	42
34	Do	97	1	do	pek sou	50	33
35	Barnagalla	98	1	ch	pekoe	95	42
36	Orion	99	1	hf-ch	pekoe	50	46
37	Liskilleen	100	7	ch	bro pek	700	58
38	Do	1	22	do	pekoe	2090	43
39	Do	2	2	do	bro tea	150	34 bid
40	K S P C, in estate mark	3	9	do	bro pek	900	62
41	Do	4	8	do	pekoe	760	48
42	Do	5	5	do	pek sou	450	42
43	Do	6	3	do	bro tea	360	34
44	Do	7	1	hf-ch	do	60	33
45	K R	8	10	ch			
			1	hf-ch	pekoe	1070	41
46	Do	9	1	ch	bro tea	83	28
47	Do	10	1	do	red leaf	84	27
48	Do	11	3	do	dust	496	27
49	Matara Oya	12	10	do	bro pek	1000	54 bid
50	Do	13	39	do	pekoe	3120	42
51	Do	14	16	do	pek sou	1600	39
52	Woodthorpe	15	1	hf-ch	bro pek	55	49
53	Do	16	7	do	pekoe	385	42
54	Do	17	8	do	unas	440	42
55	Gowera-kande	18	36	do	bro pek	1620	54
56	Do	19	29	do	pekoe	1550	41
57	Do	20	30	do	pek sou	1350	39 ibd
58	G W A	21	20	do	dust	1400	29
59	Morning-side	22	7	do	bro pek	350	56
60	Do	23	25	do	pekoe	1350	44
61	Do	24	8	do	pek sou	400	37
62	Do	25	1	do	bro tea	50	29
63	Do	26	1	do	dust	60	28
64	M	27	3	box	pekoe	60	40 bid
65	M	28	13	do	pekoe	130	40 bid
66	I N G	29	6	ch	bro pek	600	63
67	Do	30	10	do	pekoe	900	46
68	Do	31	16	do	pek sou	1440	42
69	Do	32	6	do	bro mix	600	39
70	Do	33	2	do	dust	210	28
71	D G	34	6	hf-ch	bro pek fans	330	35 bid
72	Do	35	9	do	fans	495	31
73	Do	36	5	do	dust	300	28
74	Do	37	7	do	bro mix	350	34
75	C T M	38	1	ch	bro pek	100	56
76	W E W S	39	6	hf-ch	pekoe	336	42
77	Do	40	7	ch	pek sou	718	39
78	Do	41	12	hf-ch	bro tea	597	33
79	Do	42	2	ch	dust	289	28
80	Staines	43	38	hf-ch	bro pek	2260	53 bid
81	Do	44	39	do	pekoe	1950	43
82	Do	45	30	do	pek sou	1350	40
83	D	46	10	ch	pekoe	998	45
84	Gartmore	47	5	hf-ch	bro mix	326	31
85	C A	48	2	do	pek sou	100	36 bid
86	P	49	1	do	dust	123	27
87	H	50	1	one box	flowery pek	20	38
88	A S	51	2	ch	pek sou	200	31
89	Do	52	1	do	pek dust	104	27 bid
90	Do	53	1	do	sou	94	30
91	A A	54	4	hf ch	fans	632	30
92	Do	55	1	do	bro tea	97	26
93	S S	56	5	do	fans	725	28 bid
94	W V, in estate mark	57	3	do	unas	300	40
95	D E D	58	20	ch	bro pek	2100	51 bid
96	Do	59	28	do	pekoe	2800	42 bid
97	Do	60	22	do	pek sou	1980	39
98	Panakande	61	8	do	bro pek	800	47
99	Do	62	8	do	pekoe	840	39
100	Do	63	2	do	pek sou	212	36
1	Do	164	7	do	sou	651	31
2	Do	165	3	do	unas	300	34
3	Do	166	3	do	pek fans	396	30
4	Do	167	4	do	dust	456	29
5	A	168	1	do	pekoe	100	36
6	Naseby		10	hf-ch	bro pek	520	76
7	Do		5	do	pekoe	275	64

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, January 9th, 1890.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 9th Jan.:—

Ex "Valetta"—Meddecombra, 2c 115s 6d; 10c 112s 5c 1b 107s 6d; 1t 102s; 2c 135s; 1c 1b 99s 6d; 2 bags 100s 6d.

Ex "Rewa"—Meddecombra, 1c 1t 115s 6d; 9c 110s 6d; 5c 1b 107s 6d; 1t 102s; 1c 1b 135s 6d; 2b 99s 6d; 1 bag 98s.

Ex "Valetta"—Norwood, 1t 111s; 5c 111s; 2c 110s 6d; 6c 107s; 1c 99s; 6d; 1c 1t 135s; 1c 96s 6d; 3 bags 95s 6d.

Ex "Persia"—WT, 1b 93s.

Ex "Goorkha"—Coslanda, 5c 108s; 1c 1b 107s 6d; 7c; 1 102s 6d; 1b 97s; 1b 115s; 1c 1b 98s; 2 bags 101s 6d.

Ex "Rewa"—Ravenswood, 3c 1b 111s 6d; 3c 1t 07s 1t 100-; 1t 132s.

Ex "Goorkha"—Palli, 1c 102s.

Ex "Glaucus"—Dunsinane, 1t 114s; 3c 112s; 2c 106s 6d; 1b 101s 6d; 1c 136s; 1b 100s; 1c 99s 6d; 1 bag 107s.

Ex "Traveller"—Belgravia, 2c 111s; 3c 1b 108s; 1b 101s: 1b 1t 131s. Mount Vernon, 1b 98s 6d; 1b 110s; 7c 110s; 5c 1b 106s 6d; 2c 102s 6d; 1c 1b 136s; 1b 97s; 2 bags 108s 6d.

Ex "Persia"—Udahena, 1c 104s; 2c 1b 103s; 1b 99s; 1b 120s; 1b 94s 6d.

"Glaucus"—Lunugalla, 4c 1t 107; 2c 1b 102s 6d; 2b 99s; 1t 1b 2 bags 98s 6d.

Ex "Traveller"—Wiharagalla, 5c 1b 103s 6d; 3c 107s 6d.

Ex "Glaucus"—Wiharagalla, 1c 110s; 6c 107s; 6c 103s 1c 1b 131s 6d; 2c 1t 97s 6d; 1 bag 94s; 1 95s.

Ex "Oopack"—PDM, 1b 113s; 3c 1t 98s 6d; 1c 101s 6d 1b 99s; 1t 136s; 1t 97s.

Ex "Persia"—Niabedda, 1t 102s 6d; 1c 101s. Gowerakellie, 2c 102s; 1b 99s 6d; 1t 96s 6d; 1t 95s 6d; 1b 100s; 1 bag 103s. (WHG), 1t 99s; 1c 1t 97s; 1b 91s; 1b 101s 6d.

Ex "Rewa"—Blackwood, 3c 1t 101s; 1c 1b 102s 6d; 1t 135s; 1 bag 107s; 5 96s.

Ex "Ooopack"—Meeriabedde, 2c 113s; 3c 108s; 1c 103s; 1t 136s. Hanipha, 1c 1b 112s; 2c 107s 6d; 1t 102s; 1t 136s; 2 bags 95s 6d.

Ex "Orion"—Kelburne, 8c 103s; 1t 1b 98s 6d; 2c 1b 96s 6d; 2 bags 102s.

CEYLON CACAO SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Jan. 9th, 1891.

Ex "Persia"—Gangoaroowa, 27 bags 115s.
Ex "Oroya"—Delgolla, 39 bags 100s; 6 60s.

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Jan. 9th, 1891.

Ex "Carmarthenshire"—(4)VB, 2 cases 1s 4d.

Ex "Glaucus"—Wariagalla, 2 cases 1s 11d; 3 1s 6d; 5 1s 3d; 1 1s 6d. (A&O), 1 case 2s 1d; 3 2s.

Ex "Clan Macdonald"—(A&Co.), 2 cases 2s. (JJA& Co.), 4 cases 2s; 2 1s; 1 1s 6d.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 5.] COLOMBO, FEBRUARY 16, 1891. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 28th Jan., the under-mentioned lots of Tea (15,792 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	L	35	1 ch	dust	176	24
2	L	36	1 do	red leaf	88	29
3	L	37	11 do	fans	1650	33
4	L	39	22 do	congou	2090	40
5	Gonavy	41	20 ch	bro pek	2000	68
6	Do	43	6 do	pekoe	540	53
7	Do	45	5 do	pek sou	450	48
8	Do	47	1 hf-ch	dust	75	38
9	Agra Ouvah	48	18 do	bro pek	900	57 bid
10	Do	50	22 do	pekoe	990	47
11	Do	52	16 do	pek sou	720	40
12	H J R	54	1 do	bro tea	51	28
13	Poogoda	55	16 do	pek sou	720	30
14	Glencorse	57	1 ch	unas	102	34
15	Abbotsford	58	6 do	pk dust	660	32
16	P	59	21 hf-ch	pekoe	1005	43
17	P	61	33 do	pek sou	1650	38
18	P A	63	6 do	bro pek	328	53
19	Do	65	16 ch	pekoe	1597	39
20	D E	67	6 ch	bro mix	528	34
21	Do	68	10 do	fans	800	38
22	Maddagedera	69	23 hf-ch	bro pek	1150	54
23	Do	71	29 do	pekoe	1508	45
24	Do	73	26 do	pek sou	1170	41
25	Do	75	1 do	sou	54	35
26	Do	76	3 do	dust	198	30
27	Do	77	1 do	red leaf	45	28
28	Ythanside	78	2 ch	red leaf	160	29
29	Cruden	79	29 hf-ch	sou	1450	35
30	Albion	81	33 ch	bro pek	3630	70
31	Do	83	35 do	pekoe	3500	54
32	Do	85	23 do	pek sou	2185	43 bid
33	Fernlands	87	23 do	bro pek	2530	63
34	Do	89	24 do	pekoe	2400	49
35	Do	101	12 do	pek sou	1200	45
36	Do	103	4 hf-ch	bro tea	280	34

Messrs A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 28th Jan., the undermentioned lots of Tea (68,731 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	D C S	50	4 hf-ch	pekoe	200	35
2	Do	51	13 do	unas	520	33
3	Do	53	1 do	bro mix	55	24
9	Relugas	64	41 do	bro pek	2255	56 bid
10	Do	66	17 ch	pekoe	1870	48
11	Do	68	19 do	pek sou	1900	38 bid
12	Do	70	1 do	dust	78	27
13	Do	39	1 hf-ch	red leaf	47	29
14	Nahalma	71	24 do	bro pek	1320	57
15	Do	73	29 ch	pekoe	2900	74
16	Do	75	2 hf-ch	congou	120	33
17	Do	76	1 do	dust	75	28
18	A G C	77	5 ch	bro or pek	470	50
19	Do	78	3 do	sou	300	32
20	Do	79	3 do	bro tea	270	25
21	Do	80	36 hf-ch	dust	2520	29
22	Hakurugalla	82	13 ch	bro pek	1300	55
23	Do	86	12 do	pekoe	1080	40 bid
24	Do	84	8 do	pek sou	720	36
25	Do	88	1 do	congou	93	29
26	Do	89	2 do	red leaf	200	30
27	Do	90	2 do	dust	320	28
28	Brae	30	19 do	bro pek	3000	52
29	Do	93	12 do	pekoe	1200	41
30	Do	95	19 do	pek sou	1900	37
31	Do	97	3 hf-ch	red leaf	150	27
32	Do	98	4 do	dust	240	28
33	P B	99	1 ch	red leaf	90	20
34	Do	100	7 hf-ch	dust	1050	23 bid
35	Dunlow	1	9 ch	bro pek	900	60
36	Do	3	12 do	pekoe	1080	40 bid
37	Do	5	2 hf-ch	sou	150	36
41	Woodend	12	26 hf-ch	bro pek	2730	54
42	Do	14	29 do	pekoe	2900	41 bid
43	G H A	16	17 do	bro pek	850	59
44	Do	18	16 do	pekoe	720	39 bid
45	Harrow	20	6 do	bro pek	660	60
46	Do	21	6 do	pekoe	600	45
47	Do	22	2 do	pek sou	200	41
48	Do	23	1 hf-ch	bro mix	70	29
49	Star. Mark	40	13 ch	pekoe	1430	35 bid
50	Do	42	16 do	pek sou	1760	withd'n
51	Do	44	3 do	bro mix	450	28
52	O L D	45	44 hf-ch, 44 do, 44 do	pekoe	5940	42
53	E	46	13 ch	pek sou	1300	39 bid
54	N	47	11 hf-ch	bro or pek	550	64 bid
55	P	48	4 ch	bro pek	400	63 bid
56	P	49	11 do	pekoe	1043	47 bid
60	G	31	7 do	pek sou	700	37

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today 4th Feb., the undermentioned lots of Tea (23,317 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Agar's Land	54	49 hf-ch	bro pek	2450	65 bid
2	Do	56	37 do	pekoe	1850	56
3	Do	58	40 do	pek sou	1800	47 bid
4	Do	60	7 do	sou	315	43
5	Do	62	56 do	sou No. 2	1520	39 bid
6	Agra Oya	64	9 ch	bro pek	900	68 bid
7	Do	66	4 do	pekoe No. 1	400	53
8	Do	67	18 do	pekoe No. 2	1809	46
9	Nahalma	69	23 hf-ch	bro pek	1265	61 bid
10	Do	71	22 ch	pekoe	2200	48
11	Do	73	1 do	congou	100	38 bid
12	Woodend	74	11 do	bro pek	1155	54 bid
13	Do	76	18 do	pekoe	1890	46
14	Do	78	2 do	pek sou	200	41
15	Do	79	1 do	dust	135	31
16	P G A	80	5 do	bro pek sou	450	37
17	Do	81	4 do	congou	420	34
18	Do	82	1 hf-ch	dust	70	28
19	Aldie	83	12 do	bro or pek	660	70 bid
20	Do	85	9 ch	pekoe	900	56
21	Do	87	5 do	pek sou	500	47
22	Do	88	3 hf-ch	dust	225	35
23	A	89	3 ch	pek sou	320	38
24	A	90	1 do	red leaf	100	29
25	M D	91	do	bro tea	604	37
26	A	92	4 do	pek fans	200	39
27	D H	93	11 ch	bro pek	1090	57
28	A W D	95	5 do, 1 hf-ch	or pek sou	580	40

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room today, 4th Feb., the undermentioned lots of Tea (43,290 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
1	Devonford	104	5 ch	pek sou	475	49
2	Do	106	2 do	congou	210	41
3	Do	107	1 hf-ch	dust	75	31
6	Brownlow	110	16 ch	bro pek	1680	68
7	Do	112	12 do	pekoe	1140	69
8	Do	114	12 do	pek sou	1080	50
9	Do	116	1 do	dust	120	34
10	B T	117	17 ch	bro mix	1530	40
11	Abbotsford	119	26 do	bro pek	2730	73
12	Do	121	27 do	pekoe	2700	67
13	Do	123	9 do	pek sou	900	51
14	Dunbar	125	22 do	bro pek	2200	63
15	Do	127	25 do	pekoe	2250	54
16	Do	129	7 do	sou	630	46
17	Do	131	1 do	dust	150	29
18	N, in estate mark	132	10 do	bro tea	1000	35
19	Do	134	8 hf-ch	unas	480	52
20	Deeside	136	23 do	bro pek	1380	70
21	Do	138	22 ch	pekoe	1980	58

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
22	Mocha	140	32 hf-ch	bro pek	1760	76
23	Do	142	38 ch	pekoe	3800	64
24	Do	144	20 do	pek sou	1900	53
25	Dorana-kande	146	8 do	bro mix	800	44
26	Do	148	2 hf-ch	unas	90	44
27	Do	149	3 do	pek fans	150	44
28	Do	150	3 do	dust	210	32
29	D E	151	5 ch	fans	420	44
30	Westhall	152	18 do	fans	1690	38
31	Eltofts	154	58 hf-ch	bro pek	3480	78
32	Do	156	22 ch	pekoe	1980	64
33	Do	158	40 do	pek sou	4000	51

Messrs. Someeville & Co. put up for sale at the Chamber of Commerce Sale-room today, 4th Feb., the undermentioned lots of Tea (31,891 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Ukuwala	71	11 hf-ch	pek sou	60	47
2	E A T S, Cross in estate mark	72	5 ch	bro pek	550	80
3	Do	73	4 do	pekoe	380	66
4	Do	74	6 do	pek sou	570	53
5	E L K	75	28 hf-ch	pekoe	1490	52
6	Hattanwella	76	18 do	bro or pek	900	59
7	Do	77	2 do	dust	110	30
8	Roseneath	78	19 do	bro pek	1330	64
9	Do	79	12 ch	pekoe	1320	54
10	Do	80	13 do	pek sou	1430	47
11	St Andrews, T N C	81	16 hf-ch	or pek	1056	77
12	Do	82	50 box	do	1000	73
13	Do	83	17 hf-ch	bro pek	1105	60
14	Do	84	51 do	pekoe	3264	56
15	E K L	85	10 ch	pekoe	980	52
16	A	86	3 do	dust	496	31
17	Weligama	87	24 do	pek sou	1920	47
18	N	88	1 do	red leaf	80	33
19	S R	89	8 do	pekoe	840	47
20	Wewesse	90	12 hf-ch	bro pek	600	65
21	Do	91	21 do	pekoe	1050	53
22	Do	92	16 do	pek sou	800	47
23	Do	93	7 do	sou	350	43
24	Do	94	2 do	pek fans	120	54
25	Do	95	2 do	dust	156	31
26	Kayts	96	16 do	pek sou	720	37
27	J O H	97	1 ch	pekoe	100	40
28	P	98	9 hf-ch	unas	468	46
29	Kotte	99	28 do	pek sou	1400	48
31	L	1	5 hf-ch	pek fans	225	41
32	S	2	1 do	dust	74	31
33	E P A	3	2 do	or pek	110	65
34	Do	4	4 ch	bro mix	420	36
35	Do	5	1 do	dust	140	33
36	G W	6	4 hf-ch	sou	204	37
37	G	7	8 do	sou	400	37
38	Keenawatte	8	2 ch			
			1 hf-ch	brobek	250	55
39	Do	9	6 do	pekoe	270	46
40	Do	10	7 do	pek sou	315	45
41	D E W	11	8 do	bro pek	400	63
42	Do	12	11 do	pekoe	550	49
43	Do	13	6 do	pek sou	324	46
44	K	14	1 do	green leaf	56	40
45	K S	15	1 do	bro pek	70	53
46	Do	16	5 do	pekoe	205	53
47	Do	17	4 do	pek sou	200	45
48	Do	18	1 do	bro mix	43	33

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 4th Feb., the undermentioned lots of Tea (97,618 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	G H O	50	4 box	dust	100	34
2	Do	52	4 do	congou	80	41
3	L, in estate mark	54	1 hf-ch	or pek	32	57
5	Do	56	1 do	pek sou	34	45
6	Do	58	1 do	dust	45	30
4	Kolaoya	60	102 do	or pek	5568	54
7	V	62	4 ch	bro mix	360	32
8	V	64	1 do	sou	90	39
9	Patbiagala	66	5 hf-ch	bro pek	250	65
10	Do	68	8 do	pekoe	400	55
11	Do	70	17 do	pek sou	850	50
12	Easdale	72	37 ch	bro pek	3700	69
13	Do	74	30 do	pekoe	2400	58
14	Do	76	40 do	pek sou	3200	49
15	H E P, in estate mark	78	25 hf-ch	bro pek	1625	75
16	Do	80	53 do	pekoe	3180	60
17	Do	82	36 do	pek sou	2160	49
18	Do	84	4 ch	dust	320	38
19	Chesterford	86	1 do	bro pek	120	57
20	Do.	88	1 do	pekoe	110	46
21	Do	90	1 do	pek sou	109	45
22	Aigburth	92	23 do	bro pek	2300	61 bid
23	Do	94	17 do	pekoe	1700	51 bid
24	Do	96	16 do	pek sou	1600	47
25	F F	98	2 do	dust	321	34
26	Dehiowitta	100	13 do	bro pek	1365	65
27	Do	102	23 do	pekoe	2300	51
28	Do	104	12 do	pek sou	1140	48
29	C, in estate mark	106	9 do	bro tea	900	34
30	L, in estate mark	108	11 do	bro tea	1100	34
31	Yataderia	110	16 do	bro pek	1760	67
32	Do	112	40 do	pekoe	4000	53
33	Do	114	20 do	pek sou	1800	48
34	Andangodde	116	4 do	sou	380	42
35	Do	118	1 do	red leaf	85	31
36	Do	120	4 do	red leaf	320	32
37	Do	122	9 do	dust	1350	39
38	Lesmoir	124	1 do	sou	85	37
39	Do	126	1 do	dust	150	34
40	Eadella	128	1 do	sou	85	41
41	Do	130	1 do	dust	150	34
42	H	132	2 do	or pek	200	61
43	H	134	2 hf-ch	pekoe	100	49
44	H	136	1 do	peksou	50	47
45	Telissagalla	138	2 do	bro mix	120	43
46	Do	140	4 do	dust	396	38
47	Do	142	2 do	red leaf	80	33
48	St. Leonard's	144	1 ch	dust	140	35
49	Theberton	146	45 do	bro pek	4500	54
50	Do	148	30 do	pekoe	3000	47
51	Do	150	27 do	bro pek sou	2700	46
52	Do	152	15 do	fans	1500	40
53	T C O	154	2 do	sou	200	38
54	Letheaty	156	13 hf-ch	sou	780	44
55	S B C	158	2 do	or pek	116	60
56	Nagoya	160	10 ch	bro pek	1000	59
57	Do	162	7 do	pekoe	595	49
58	L D	164	6 do	pekoe No. 1	600	withd'n.
59	Do	166	30 hf-ch	pekoe	1350	withd'n.
60	N C	168	13 do	unas	650	37
61	Digola	170	7 ch	bro pek	700	55
62	Do	172	6 do	pekoe	600	47
63	Do	174	9 do	pek sou	900	45
64	Beverley	176	22 hf-ch	bro pek	1320	60
65	Do	178	65 do	pekoe	3575	53
66	Do	180	20 do	pek sou	1030	47
67	Maryland	182	8 ch	bro or pek	760	60
68	Do	184	8 do	or pek	640	51
69	Do	186	10 do	pek sou	750	48
70	Do	188	2 hf-ch	sou	180	37
71	Do	190	2 ch	dust	176	35
72	L B	192	3 do	pekoe	280	withd'n.
73	Do	194	1 do			
			1 hf-ch	pek sou	124	43
74	Do	196	5 ch	bro tea	514	41
75	Do	198	1 do	dust	147	35
76	D A	200	9 do	pekoe	850	49
77	Do	201	1 do			
			6 hf-ch	faus	561	35
78	Bandara-polla	204	24 do	bro pek	1200	66
79	Do	206	25 do	pekoe	1750	57
80	Do	208	29 do	pek sou	1305	49
81	Palamcotta	210	15 do	bro pek	750	58
82	Do	212	12 do	pekoe	600	52
83	Do	214	12 do	pek sou	660	47
84	Do	216	9 do	sou	450	43
85	Do	218	1 do	dust	85	35
86	Do	220	1 ch	red leaf	100	32
87	Liskilleen	222	12 hf-ch	bro pek	600	66
88	Do	224	26 do	pekoe	1170	55
89	Horagas-kelle	226	3 do	bro pek	180	63
90	Do	128	3 do	pekoe	168	50
91	Do	230	13 do	pek sou	728	47
92	Do	232	2 do	bromix	154	34

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 11th Feb., the undermentioned lots of Tea (93,654 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	o.
3	L	12	8 ch	congou	760	40
4	L	14	2 do	dust	360	38
5	L	15	6 do	fans	900	35
6	Gonavy	17	20 do	bro pek	2000	67
7	Do	19	3 do	pekoe	270	54
8	Do	20	3 do	pek sou	270	48
9	Do	21	1 hf-ch	dust	75	37
10	Anchor, in estate mark	22	12 do	bro pek	1380	66 bid
11	Do	24	23 ch	pekoe	2300	54 bid
12	Do	26	15 do	pek sou	1500	48
13	Templestowe	28	36 hf.ch	or pek	1872	60 bid
14	Do	30	18 ch	pekoe	1620	51 bid
15	Do	32	24 do	pek sou	2304	45
16	Great Valley	34	23 do	bro pek	2530	61 bid
17	Do	36	25 do	pekoe	2500	53
18	Do	38	24 do	pek sou	2160	46
19	Keenagoda	40	20 hf-ch	bro pek	1200	68
20	Do	42	12 ch	pekoe	1380	46 bid
21	Do	44	8 do	pek sou	880	44
22	Do	46	1 do	dust	171	32
23	Do	47	1 hf-ch	congou	65	30
24	Polgahakanda	48	19 ch	bro pek	1900	58
25	Do	50	14 do	pekoe	1260	48
26	Do	52	17 do 1 hf-ch	pek sou	1580	44
27	Do	54	4 ch	bro tea	280	35
28	Do	55	1 hf-ch	red leaf	29	30
29	Do	56	1 do	dust	25	30
30	Logan	57	18 do	bro pek	900	60 bid
31	Do	59	18 do	pekoe	810	50
32	Do	61	31 do	pek sou	1395	45
33	Do	63	12 do	sou	540	39
34	Do	64	7 do	dust	420	25
35	Ottery	65	25 ch	bro pek	2500	77
36	Do	67	53 do	pekoe	4770	59
37	Do	69	18 do	sou	1620	49
38	Do	71	2 do	bro mix	260	33
39	H J R	72	14 do	bro pek	1330	60
40	Do	74	20 do	pekoe	1600	49
41	Do	76	12 do	pek sou	1020	43
42	Do	78	1 hf-ch	dust	80	32
43	G K W	79	2 ch	bro tea	180	42
44	Do	80	1 do	dust	80	33
45	Madooltenne	81	12 do	bro pek	1320	58
46	Do	83	15 do	pekoe	1500	46
47	Do	85	12 do	pek sou	1200	41
48	Galkandawatte	87	35 do	bro pek	3500	73
49	Do	89	47 do	pekoe	4230	53
50	Bittacy	101	13 hf-ch	bro pek	780	70 bid
51	Do	103	22 do	pekoe	1320	51 bid
52	B, in estate mark	105	1 do	congou	60	40
53	Do	106	1 do	dust	90	32
54	W K	107	2 ch	red leaf	102	28
61	Blackburn	117	14 do	pekoe	1377	51
62	Do	119	2 do	pek sou	180	42
63	Do	120	1 do	dust	65	32
64	Agra Ouvah	121	64 box	bro or pek	740	71
65	Do	123	24 hf-ch	bro pek	1200	58 bid
66	Do	125	31 do	pekoe	1395	50 bid
67	Do	127	25 do	pek sou	1125	45 bid
68	Do	129	13 do	congou	520	41
69	Do	130	3 do	dust	225	33
70	Brownlow	131	25 ch	bro pek	2625	52 bid
71	Do	133	17 do	pekoe	1615	49 bid
72	Do	135	11 do	pek sou	990	45
73	B T	137	18 do	bro mix	1530	37
74	Do	139	1 hf-ch	dust	70	33
75	Eila	140	10 ch	bro pek	1000	55
76	Do	142	18 do	pekoe	1440	46
77	Do	144	18 do	pek sou	1440	44
78	Do	146	1 do	dust	125	33

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 11th Feb., the undermentioned lots of Tea (81,126 lb.), which sold at under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	S L	19	1 hf-ch	pek dust	79	34
2	E A	20	1 ch	pek dust	149	35
3	G W A	21	3 ch	bro pek	300	53
4	Do	22	4 do	pekoe	400	43
5	Do	23	4 do	bro pek sou	350	33
6	Chertsey	24	21 hf-ch	pekoe	1050	50
7	Do	25	10 do	pek sou	500	45
8	Do	26	6 do	pek fans	360	40
9	Do	27	3 do	bro mix	180	34
10	Do	28	1 do	pek sou No. 2	40	38
11	Epping	29	8 do	bro pek	400	58 bid
12	W	30	2 do	pek dust	156	32
13	A N	31	4 ch	bro tea	320	33
14	Do	32	4 do	pek sou	380	42 bid
15	Do	33	1 do	pek dust	146	35 bid
16	Mousa	34	22 hf-ch	bro pek	1210	61
17	Do	35	25 do	pekoe	1250	50 bid
18	Do	36	35 do	pek sou	1750	45
19	Do	37	2 do	sou	100	38
20	Do	38	2 do	red leaf	95	29
21	C O L	39	1 hf-ch	pek dust	74	33
22	D	40	6 hf-ch 1 ch	pek fans	561	35
23	Blairavon	41	15 ch	bro pek	1500	64 bid
24	Do	42	18 do	pekoe	1620	53 bid
25	Do	43	21 do	pek sou	1890	46 bid
26	Forest Hill	44	12 ch	bro pek	1200	65
27	Do	45	14 do	pekoe	1260	47 bid
28	Do	46	4 do	pek sou	360	45
29	Do	47	1 do	red leaf	100	30
30	Do	48	1 do	dust	130	32
31	M M	49	8 hf-ch	bro pek	440	60
32	Do	50	14 ch	pekoe	1150	44
33	Do	51	12 hf-ch	pek sou	600	41
34	M S	52	1 hf-ch	bro pek	50	52
35	Do	53	1 box	bro pek	24	47
36	Do	54	1 box	pekoe	22	42
37	Do	55	1 hf-ch	do	50	42
38	Do	56	2 do	pek sou	94	38
39	Lyndhurst	57	8 ch	bro pek	880	60
40	Do	58	17 do	pekoe	1615	45
41	Do	59	23 do	pek sou	2070	40 bi
42	Mapitigama	60	4 ch	bro pek	435	60
43	Do	61	8 do	pekoe	760	46 bid
44	Do	62	10 do	pek sou	900	39 bid
45	Depedene	63	18 hf-ch	bro pek	900	62
46	Do	64	25 do	pekoe	1250	31 bid
47	Do	65	31 do	pek sou	1550	41 bid
48	H D	66	3 do	bro mix	150	31 bid
49	Do	67	3 do	dust	240	31
50	Do	68	54 do	bro tea	2700	37
51	S S	69	4 do	pekoe	220	out
52	B F	70	3 ch	dust	375	39
53	C T M	71	3 ch	bro mix	270	32
54	Do	72	1 hf-ch	dust	70	31
55	Arslena	73	13 do	unas	650	46
56	Do	74	1 do	sou	50	37
57	Do	75	4 do	dust	200	32
58	Chippendale	76	17 do	bro pek	850	35 bid
59	Do	77	68 do	pek sou	2380	29 bid
60	M	78	1 ch	dust	102	28
61	St. Andrews T N C	79	13 do	pek sou	780	43 bid
62	Do	80	4 do	dust	380	33
63	J J S	81	6 do	red leaf	468	25
64	Do	82	1 do	bro tea	90	30
65	F	83	4 do	bro mix	372	31
66	Do	84	3 hf-ch 1 ch	pek dust	315	31
67	S	85	4 do	sou	354	31
68	Do	86	3 do	red leaf	150	28
69	Do	87	2 do	dust	290	30
70	T	88	1 hf-ch	pekoe	55	35
71	Allakolla	89	22 do	bro pek	1430	59 bid
72	Do	90	29 ch	pekoe	3045	50 bid
73	Do	91	19 do	pek sou	1900	44 bid
74	Urakanda	92	1 do	bro pek	100	56
75	Do	93	1 do 1 hf-ch	pekoe	150 with dnw	
76	M O	94	1 do	bro tea	46	30
77	C in estate mark	95	2 ch 1 hf-ch	pek sou	250	36
78	Do	96	2 ch 1 hf-ch	bro mix	250	28
79	Do	97	2 do	dust	178	29
80	C B	98	23 do	pek fans	1100	30
81	H H	99	24 do	pekoe	1212	45
82	T, in estate mark	100	17 do	unas	884	42 bid
83	Do	1	1 do	mixed	60	38
84	Do	2	3 do	dust	228	34
85	Elakanda	3	4 do	bro pek	220	89
86	Do	4	7 do	pekoe	350	52 bid
87	Do	5	18 do	pek sou	900	45
88	Do	6	9 do	bro mix	495	37
89	Do	7	9 do	unas	468	42 bid
90	Do	8	2 do	dust	160	31
91	Do	9	1 do	red leaf	45	30

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
96	Aadneven	14	17	do	bro pek	1700	60 bid
97	Do	15	25	do	pekoe	2250	50 bid
98	K M O K	16	1	do	bro tea	90	39 bid
99	Weregalla	17	14	do	bro pek	1400	60 bid
100	Do	18	16	do	pekoe	1360	46 bid
101	Do	119	17	do	pek sou	1360	40 bid
102	Kitulgalla	120	3	do	bro pek	300	54 bid
103	Do	121	6	do	pekoe	480	43 bid
104	Do	122	6		pek sou	480	41 bid
105	Do	123	1	ch	dust	125	31
106	Abbotsford	124	34	ch	bro pek	3570	71 bid
107	Do	125	38	do	pekoe	3800	62 bid
108	Do	126		do	pek sou		44 bid
109	Vincit	127	6	do			
			1	hf-ch	bro or pek	690	54 bid
110	Do	128	9	ch	or pek	900	45 bid
111	Do	129	12	do	pekoe	1200	40 bid
112	Do	130	7	do	pek sou	700	38 bid
113	Do	131	1	do	congou	100	29 bid
114	Do	132	6	hf-ch	dust	420	22 bid

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, January 16th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane, up to 16th Jan.:—

Ex "Chingwo"—Meddecombra, 1c 1b 115s 6d; 5c 110s; 4c 110s 6d; 6c 107s 6d; 1t 101s; 1c 1t 1b 136s 6d; 1c 100s 6d; 1 bag 108s.

Ex "Rewa"—Meddecombra, 1 bag 9 s.

Ex "Pallas"—Sarnia, 2c 1b 107s 6d; 1c 1b 103s 6d 1b 99s 6d; 1t 131s; 1c 97s 6d. Agra, 1c 1t 108s 6d; 1c 1t 1b 106s; 1b 106s; 1t 131s; 1b 126s; 1t 97s.

Ex "Chingwo"—Bogawantalawa, 2c 1b 110s; 5c 1b 105s; 1b 99s; 1b 1t 130s 6d. Uva Estate, 1c 100s 6d; 1c 1b 106s 6d; 1c 1b 103s; 1b 99s; 2b 113s; 1b 97s 6d. Elmshurst RWA, 2c 106s; 2c 1b 103s; 1b 99s; 2b 109s; 1t 97s 6d; 1c 1t 109s 6d; 2c 1b 108s; 1b 101s; 1b 110s; 1b 101s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 23rd Jan.:—

Ex "Hesperia"—Tillicoultry, 1c 112s 6d; 4c 110s 6d; 3c 1b 107s 6d; 1b 102s; 1c 1t 136s.

Ex "Chingwo"—New Valley, 4c 1b 113s 6d; 2c 1lb 107s 6d; 1b 102s; 1c 136s; 1b 98s; 1b 110s. North Matale, 1c 1t 108s 6d; 3c 101s; 1b 105s; 2b 125s 6d; 1c 98s; 1b 105s.

Ex "Hesperia"—Portree, 1b 116s; 3c 115s; 3c and 1b 110s 6d; 1b 102s; 2t 137s 6d; 1c 100s; 1b 101s.

Ex "Prometheus"—Bogawantalawa, 1b 2c 114s; 3c 1t 108s 6d; 1b 102s; 2t 137s 6d; 1t 101s. Victoria, 1b 100s; 1c 100s; 1b 99s; 1b 103s; 1c 96s 6d.

Ex "Chingwo"—Pittarat Malle, 1b 109s; 1b 1c 108s; 4c 105s; 1c 101s; 1c 120s; 1c 98s; 2b 105s; 1b 97s.

Ex "Hesperia"—Pittarat Malle, 1b 113s; 1c 112s; 4c 1b 108s; 1t 101s; 1t 132s; 1c 100s 6d; 2b 106s 6d.

Ex "Prometheus"—Claremont, 4c 112s; 2c 1t 106s 6d; 1c 135s. Wannarajah, 1b 113s; 3c 1b 112s 6d; 4c 108s; 2c 101s 6d; 1c 1b 138s; 1c 99s.

Ex "Traveller"—PDM, 4c 110s.

Various ships:—KTCT, 2c 98s 6d. Yoxford, 1c 114s Mousaella, 1b 107s. Yoxford, 1c 114s 6d. Mousaella, 1c 1b 106s 6d. Meddecombra, 1b 111s. (OBEO)DN 5 bags 89s 6d.

CEYLON CINCHONA SALES IN LONDON.

(*From Wilson, Smithett, & Co.'s Circular.*)

MINCING LANE, Jan. 16th, 1891.

Mark	Natural Stem	Renewed	Root
Maria	...	3½d	...
ST & LO,A	2d to 2½d	...	...
Cranley	2d	3d to 3½d	3½d
Verelapatna	2½d to 3½d	5d	...
Vevebedde	2¾d	4d to 4½d	...
Gonakelle	2½d to 3½d	3½d to 4d	...
Mahakanda	2½d to 3d	4d	...
Tulloes	2d to 2½d	4d	...
GSR in diamond	3d	...	...
MCO Co. "	3¾d	...	...
Meeriabedde	3½d	...	...
Roeberry	3¼d	...	...

The following shows the prices realised for some of the chief marks:—

Mark	Natural Stem	Renewed	Root
Maba Uva	2d to 2½d	3d to 3½d	...
Elldalua	1¾d	...	...
Uvakellie	2d to 2½d	3½d to 4d	...
Dooroomadella	3d	...	...
Wattegodde	2¾d to 3d	4d	...
Tillicoultry	2d to 3d	...	...
EC in diamond	2¼d to 2½d	3½d	3d
Kolapatna	2d	2½d	...
Gordon	4½d to 5d	6½d to 9½d	...
OFFICINALIS.			
Cobo	1¾d	3d	...
Meeriatenne	2½d	4d	...
ST & LC A in diamond	3½d	...	...
Cranley	2d to 2½d	4½d	...
Kolapatna	2½d	...	2½d to 3d
TE Co.	4¾d	...	...
Vevebedde	4½d to 5d	6d	...
St. John's	3d	6d to 6½d	...
Maha Uva	4½d	7½d	...
Oliphant	...	5d	...
CH de S	3d to 3½d	5½d	...
Dunsinane	4d	5½d	...
St. Leonard's	4d	7d to 8½d	...
Ormiston	2½d to 3d	...	..

CEYLON CACAO SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Jan. 16th, 1891.

Ex "Oopack"—Yattewatte, 6 bags 72s; 1 73s; 4 80s; 4 77s; 1 50s. Malvern, 16 bags 115s; 2 72s 6d.

Ex "Traveller"—Eriagastenne, 1 bag 60s.

Ex "Persia"—Kepitigalla, 12 bags 80s 6d; 9 79s; 2 55s.

Ex "Oopack"—Palli, 105 bags 119s; 8 68s 6d; 7 88s; 2 80s. Hylton, 24 bags 108s 6d; 2 89s; 2 83s 6d; 6 89s; 1 70s.

Ex "Orient"—Hylton, 29 bags 110s; 6 89s; 1 65s.

Ex "Orizaba"—Beredewelle, 2 bags 73s 6d; 1 55s; 2 37s.

MINCING LANE, Jan. 23rd, 1891

Ex "Hesperia"—Wariapolla, 24 bags 96s 6d; 19 97s 6d; 20 78s 6d; 25 75s; 3 61s 6d; 4 58s 6d. Ponduppe, 11 bags 105; 2 67s; 1 48s. Kepitigalla, 32 bags 107s 6d; 11 80s; 10 62s 6d; 3 64s; 3 53s 6d. Aloowihare, 4 bags 80s 6d 11 64s. North Matale, 21 bags 105s; 8 82s 6d; 25 64s; 6d.

"Chingwo"—Guava Hill, 25 bags 113s. Yattwatte, 119 bags 107s 6d; 10 68s; 2 65s; 3 72s. Woodsee, 44 bags 105; 10 68s 6d. Bulatwatte, 26 bags 106s 6d; 1 72s; 3 55s.

Ex "Valetta"—Bulatwatte, 5 bags 72s; 1 50s; 2 20s.

"Orient"—Dynevor, 54 bags 107s 6d; 9 67s; 1 25s.

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Jan. 23rd, 1891.

Ex "Orion"—Gallentenne, 4 cases 3s 3d; 2 1s 5d; 2 1s 3d; 2 1s 7d.

Ex "Robilla"—Laxapanagalla, 2 cases 1s 8d; 3 1s 7d.

Ex "Traveller"—Esperenze, 9 cases 1s 8d.

Ex "Orient"—Wattegalla, 1 case 2s 3d; 2 1s 7d; 2 1s.

Ex "Clan Stuart"—CRP, 1 case 1s 9d; 5 1s 3d.

No. 6.] COLOMBO, FEBRUARY 21, 1891. { PRICE :—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room, today, 11th Feb., the undermentioned lots of Tea (43,719 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Glanrhos	1	6 hf-ch	bro pek	480	57 bid
2	Do	3	10 do	pekoe	700	46 bid
3	Do	5	17 do	pek sou	1275	44
4	Do	7	1 do	congou	75	31
5	Bogahagoda-watte	8	4 do	bro pek	270	49
6	Do	9	6 do	pekoe	305	42
7	Do	11	6 do	pek sou	300	39
8	Do	13	5 do	bro mix	322	32
9	Do	14	2 do	faos	117	40
10	Do	15	1 do	dust	86	38
16	A G C	26	21 hf-ch	dust	1400	32
21	G H K, in estate mark	35	7 ch	or pek	700	56
22	Do	37	12 do 1 hf-ch	pekoe	1144	42 bid
23	Do	39	9 ch	pek sou	900	40
24	N	41	6 hf-ch	pekoe	291	48 bid
25	A W H	43	5 ch	pek dust	413	32
26	E G	45	12 do	bro pek sou	1200	33
27	K P W	47	15 hf-ch	bro pek	750	57 bid
28	Do	49	27 do	pekoe	1215	50
29	Do	51	26 do	pek sou	1170	45
30	Do	53	6 do	sou	240	43
31	Do	55	2 do	dust	140	32
32	Yarrow	56	9 ch	bro pek	576	69
33	Do	58	17 do	pekoe	1020	46 bid
34	Comillah	60	4 hf-ch	bro pek	220	53 bid
35	Do	61	6 do	pekoe	300	45 bid
36	Do	63	7 do	pek sou	350	41
37	Do	65	1 do	dust	65	30 bid
38	Dalguise	66	9 ch	bro pek	990	51 bid
39	Do	68	22 do	pekoe	2140	48 bid
40	Do	70	7 do	pek sou	655	44 bid
41	Do	72	2 do	dust	254	32 bid
42	Do	73	1 do	bro mix	92	31 bid
43	Mohedin	74	2 hf-ch	bro pek	80	59
44	Do	75	3 do	pekoe	132	44 bid
45	Do	76	4 do	pek sou	160	39
46	Do	77	1 do	congou	48	32
47	Do	78	1 do	faus	42	31
48	Do	79	1 do	red leaf	42	28
49	Agraoya	80	15 ch	bro pek	1500	64 bid
50	Do	82	2 do	pekoe No. 1	200	51 bid
51	Do	83	9 do	do No. 2	900	49 bid
52	Do	85	1 do	dust	100	33 bid

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 11th Feb., the undermentioned lots of Tea (206,433 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Fetteresso	234	2 ch	sou	180	40
2	"	236	1 do	dust	155	32
3	K H L	238	4 do	bro mix	440	33
4	K B	240	2 do	red leaf	135	31
5	"	242	1 do 1 hf-ch	unas	140	41
6	S P A	244	4 do	sou No. 1	200	40
7	"	246	9 do	do " 2	450	38
8	"	248	1 do	or pek dust	80	38
9	"	250	5 do	pek dust	425	34
10	"	252	6 do	bro tea	300	35
11	"	254	4 do	unas	200	41
12	"	256	2 do	bro mix	110	38
13	"	258	1 do	congou	40	30
14	S P K	260	1 do	pekoe	60	45
15	S P V	262	2 do	bro pek	120	62
16	"	264	3 do	pekoe	165	48
17	"	266	4 do	pek sou	220	45
21	W K	274	4 hf-ch	or pek	220	85
22	"	276	17 do	pekoe	850	60
23	"	278	6 do	pek sou	270	45
24	"	280	3 do	unas	150	39
25	"	282	3 do	faos	163	34
26	D, in estate mark	284	4 ch	bro pek	400	56
27	"	286	6 do	pekoe No. 1	600	51
28	"	288	3 do 3 hf-ch	pekoe No. 2	477	44
29	D C	290	3 do	bro pek	150	57
30	"	292	5 do	pekoe	250	50
31	"	294	9 do	pek sou	450	43
32	"	296	4 do	red leaf	200	32
33	"	298	1 do	congou	50	30
34	"	300	1 do	dust	60	32
35	Kattiagalla	302	9 ch	bro pek	900	54
36	"	304	28 do	pekoe	2800	42
37	"	306	10 do	pek sou	1000	37
38	"	308	2 hf-ch	pek sou	100	34
39	"	310	2 ch	congou	194	26
40	"	312	6 hf-ch	dust	417	31
41	"	314	3 ch	red leaf	298	32
42	"	316	2 hf-ch	red leaf	96	32
43	Tooacombe	318	33 do	bro pek	1650	71
44	"	320	59 do	pekoe	2655	54
45	"	322	56 do	pek sou	2520	45
46	"	324	22 do	sou	880	42
47	"	326	4 do	dust	320	32
48	H E P, in estate mark	328	17 do	bro pek	1020	67
49	"	330	16 do	pekoe	960	53
50	"	332	12 do	pek sou	720	45
51	Glenorchy	334	21 do	bro pek	945	89
52	"	336	25 do	pekoe	1125	62
53	Tellisagalla	338 339	22 ch 2 hf-ch	} bro pek	1540 132	60 46
54	"	340	35 ch	pekoe	1960	50
55	"	342	16 do	pek sou	960	45
56	"	344	10 do	bro pek faos	700	44
57	Melrose	346	27 hf-ch	bro pek	1620	64
58	"	348	18 ch	pekoe	1800	48
59	"	350	12 do	pek sou	1200	45
60	"	352	2 do	congou	156	36
61	Pansaltenne	354	14 do	bro pek	1470	61 bid
62	"	356	13 do	pekoe	1300	56
63	"	358	14 do	pek sou	1330	47
64	Aocoombra	360	8 ch	bro pek	896	63
65	"	362	5 do	pekoe	560	53
66	"	364	9 do	pek sou	960	45
67	"	366	3 do	sou	300	42
68	"	368	1 do	dust	140	33
69	Deaculla	370	8 hf-ch	or pek	480	88
70	"	372	20 ch	pekoe	2000	61
71	"	374	2 do	dust	140	33
72	P D M	376	2 do	congou	200	42
73	"	378	1 do	dust	132	32
74	Theberton	380	7 do	pek dust	700	31
75	"	382	7 do	red leaf	700	32
76	"	384	4 do	congou	400	32
77	Kolaoya	386	76 hf-ch	pekoe	3795	51
84	Dehiowitta	400	9 do	bro pek	945	59
85	"	402	18 do	pekoe	1800	46
86	"	404	12 do	pek sou	1140	42
87	"	406	1 do	bro tea	120	35
88	Yataderia	408	14 do	bro pek	1540	59 bid
89	"	410	37 do	pekoe	3700	46 bid
90	"	412	28 do	pek sou	2520	43
91	"	414	9 do	bro tea	810	37
92	K B	416	19 do	bro pek	1900	55 bid
93	"	418	14 do	pekoe	1330	52
94	"	420	5 do	pekoe	450	50
95	"	422	7 do	pek sou	630	42
96	"	424	2 hf-ch	dust	160	32
97	"	426	1 do	sou	55	38
98	G L, in estate mark	428	2 ch	ooloog	108	30
99	"	430	1 do	bro mix	55	27
100	C F, in estate mark	432	23 hf-ch	bro pek	1150	78
101	"	434	39 ch	pekoe	2925	56
102	"	436	6 do	pek sou	450	47
103	"	438	1 do	dust	80	32
104	"	440	1 do	bro mix	60	28

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
105	Atherfield	412	2	hf-ch	dust	160	32
106	,,	444	8	do	bro tea	400	39
116	Nyanza	464	19	do	bro or pek	950	61
117	,,	466	31	do	bro pek	1550	55
118	,,	468	27	do	pekoe	2700	49
119	,,	470	17	do	pek sou	1700	42
122	Midlothian	476	16	hf-ch	bro pek	800	60 bid
123	,,	478	17	ch	pekoe	1870	48
124	,,	480	2	hf-ch	congou	120	37
125	A, in estate mark	482	1	do	or pek	69	47
126	,,	484	2	ch	bro pek	200	36
127	,,	486	21	hf-ch	pk sou	1155	33
128	,,	488	4	do	pek fans	272	33
129	,,	490	1	ch	bro mix	113	28
130	U R	492	5	hf-ch	unas	259	45
131	Dessford	494	13	ch	bro pek	1456	54 bid
132	,,	496	13	do	pekoe	1300	44 bid
133	,,	498	13	do	pek sou	1430	44 bid
134	Amblakande	500	5	ch	bro or pek	500	62
135	,,	502	8	do	pekoe	720	46
136	,,	504	5	do	sou	450	39
137	,,	506	2	do	bro mix	240	31
138	Avissawella	508	12	do	bro pek	1200	57 bid
139	,,	510	13	do	pekoe	1170	42 bid
140	,,	512	33	do	pek sou	2970	41 bid
141	,,	514	5	do	sou	525	39
142	,,	516	3	do	dust	450	32
143	H S	518	17	do	sou	1445	40
144	,,	520	4	do	dust	560	33
145	Patiagama	522	12	do	bro pek	1320	60
146	,,	524	30	do	pekoe	2935	47
147	,,	526	1	do	pek sou	100	40
148	,,	528	1	do	dust	150	32
149	Palmerston	530	4	do	bro pek	260	65
150	,,	532	12	do	pekoe	1200	53
151	,,	534	8	do	pek sou	760	47
152	G B, in estate mark	536	5	do	bro pek	504	} out
153	,,	538	4	do	pekoe	400	
154	,,	540	3	hf-ch	bro mix	210	
155	,,	542	3	ch	dust	300	29
156	,,	544	1	hf-ch	bro tea	60	25
157	Middleton	546	29	do	bro pek	1885	60 bid
158	,,	548	14	ch	pekoe	1400	54 bid
159	,,	550	1	hf-ch	dust	80	32
160	St. Leonard's	552	1	ch	pek sou	100	37
161	C R D	554	3	hf-ch	dust	180	32
162	,,	256	3	do	red leaf	195	31
163	Weyvelheena	558	9	ch	bro pek	810	62
164	,,	560	21	do	pekoe	1680	47
165	,,	562	4	do	pek sou	280	42
166	N	564	12	hf-ch	sou	600	43
167	N	566	4	do	dust	300	32
168	Thornfield	568	36	do	bro pek	2160	60 bid
169	Do	578	23	ch	pekoe	2300	50
170	Do	572	2	hf-ch	pek dust	160	33
171	Portmore	574	46	ch	bro pek	5060	63
172	Do	576	22	do	pekoe	2200	53
173	P	578	1	do	fans	112	
174	N, in estate mark	580	14	hf-ch	dust	1050	34
175	Harangalla	582	38	ch	bro pek	3800	52 bid
176	Do	584	77	do	pekoe	6930	45
177	Polatagama	586	24	hf-ch	bro pek	1320	59
178	Do	588	43	do	pek	2580	49
179	Do	590	44	do	pek sou	2420	45
180	Abamalla	592	14	do	bro mix	840	38
181	Do	594	3	do	dust	240	33
182	Farnham	596	19	do	bro or pek	950	65
183	Do	598	22	do	pekoe	990	51
184	Do	600	39	do	pek sou	1755	44
185	Do	2	2	do	fans	120	34
186	Do	4	1	do	bro tea	50	33
187	F, in estate mark	6	4	hf-ch	bro tea	200	38
188	P B, in estate mark	8	12	do	pekoe No. 1	600	44
189	D	10	6	ch	do	600	44 bid
190	Poonmaude	12	13	hf-ch	bro pek	650	68
191	Do	14	16	do	pekoe	720	53
192	Do	16	13	do	pek sou	585	46
193	Do	18	2	do	dust	120	33
194	Bonaccord	20	10	do	bro pek	450	64
195	Do	22	24	do	pekoe	1080	51 bid
196	Do	24	2	do	dust	120	30
197	L D	26	30	do	pekoe	1350	46
198	Bismark	28	3	ch	dust	420	32
199	Chesterford	30	20	hf-ch	bro pek	1200	55 bid
200	Do	32	25	do	pekoe	1250	42 bid
201	Do	34	22	do	pek sou	1100	41
202	Elfindale	36	126	hf-ch	pekoe	5040	47
203	Do	38	108	do	pek sou	4320	40
204	Do	40	35	do	pek fans	1750	32
205	Do	42	46	do	bro mixed	2120	31
223	Radella	78	32	ch	bro pek	3200	58 bid
224	Do	80	24	do	pekoe	1920	47 bid
225	Do	82	24	do	pek sou	1920	43

Messrs. E. Benham & Co. put up for sale at the Chamber of Commerce Sale-room today, 18th Feb., the undermentioned lots of Tea (1,226 lb.) which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	H H	16	5	ch	pek sou	560	47
2	Do	18	3	do	bro mix	420	33
3	Elston	20	2	hf-ch	dust	140	32 bid
4	Do	22	2	do	congou	90	36
5	B D	23	1	ch	mixed	100	30

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room today, 18th Feb., the undermentioned lots of Tea (67,483 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.		Description.	Weight. lb.	c.
1	Kelani	1	36	hf-ch	bro pek	1980	64 bid
2	Do	3	123	do	pekoe	5535	47 bid
3	Do	5	73	do	pek sou	3285	45
4	Do	7	2	do	dust	132	33
5	A K A C, in estate mark	8	36	do	pekoe	1800	50
6	Do	10	13	do	sou	650	45
7	Do	12	2	do	dust	142	31
8	Do	13	4	do	fans	241	39
9	P O	14	10	do	unas	567	45
10	Do	16	1	do	congou	50	35
11	Do	17	1	do	dust	63	36
12	Torrington	18	21	ch	bro or pek	2310	70 bid
13	Do	20	38	do	bro pek	4180	52 bid
14	Do	22	45	do	pekoe	4500	48 bid
15	Do	24	30	do	pek sou	3000	45 bid
16	Do	26	9	do	dust	810	34
17	Penrhos	28	7	hf-ch	bro or pek	140	withd'n
18	Do	30	11	do	bro pek	550	65 bid
19	Do	32	21	do	pekoe	1260	50 bid
20	Do	34	20	do	pek sou	1000	48
21	Nahalma	36	33	do	bro pek	1815	58 bid
22	Do	38	34	do	pekoe	3400	48 bid
23	Do	40	5	do	sou	300	40
24	Do	42	1	do	dust	75	33
29	Dunottar	49	14	ch	bro pek	1400	} withd'n
30	Do	51	42	hf-ch	or pek	2520	
31	Do	53	6	ch	pekoe	540	
32	Do	55	1	do	sou	86	
33	Do	56	1	do	dust	120	
38	F, in estate mark	61	15	ch	sou	1200	38 bid
39	St. M, in estate mark	66	3	hf-ch	bro pek	135	60 bid
40	Do	67	4	do	pekoe	180	46 bid
41	Do	68	1	do	sou	39	41
42	Do	69	1	do	dust	36	30
43	Relugas	70	24	do	bro pek	1320	66 bid
44	Do	72	11	ch	pekoe	1210	50 bid
45	Do	74	14	do	pek sou	1400	47
46	Do	76	1	do	dust	153	31
47	Horagoda	77	8	do	bro pek	800	57 bid
48	Do	79	35	do	pekoe	3325	45 bid
49	Do	81	2	do	pek sou	190	43
50	Do	82	1	do	dust	145	32
51	A G C	83	1	do	congou	90	34
52	Do	84	2	do	bro tea	180	30
53	Do	85	9	hf-ch	dust	630	32
54	T	86	1	do	pek sou	39	40
55	G H K, in estate mark Ceylon	87	5	ch	or pek	500	50 bid
56	Do	89	10	do	pekoe	1000	40 bid
57	P	91	1	hf-ch	dust	70	34
58	Nahalma	92	35	do	bro pek	1925	56 bid
59	Do	94	35	ch	pekoe	3500	46 bid
60	Do	96	7	do	pek sou	700	43
61	Do	98	1	hf-ch	dust	75	33

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 18th Feb., the undermentioned lots of Tea (99,357 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Ismalle	94	2 hf-ch	dust	232	35
2	,,	96	1 ch	bro mix	82	35
3	Mahatenne Uva	98	3 hf-ch	or pek	180	63
4	,,	100	5 do	pekoe	300	51
5	,,	102	2 do	unas	120	51
6	Becherton	104	6 ch	bro pek	600	61
7	,,	106	12 do	pekoe	1140	48
8	,,	108	1 do	pek sou	100	30
9	Mausakelle	110	12 hf-ch	bro pek	660	67 bid
10	,,	112	13 do	bro pek	780	67 bid
11	,,	114	16 do	pekoe	1600	50 bid
12	,,	116	30 do	pekoo	1800	out
13	,,	118	1 do	congou	70	41
14	,,	120	2 do	dust	200	32
15	Shrubs Hill	122	20 ch	bro pek	2000	61 bid
16	,,	124	20 do	pekoe	2000	51
17	,,	126	26 do	pek sou	2210	47
18	,,	128	1 do	sou	95	38
19	,,	130	3 do	unas	252	42
20	,,	132	1 do	dust	150	34
21	Farm	134	18 hf-ch	bro pek	810	61
22	,,	136	9 ch	pekoe	810	53
23	,,	138	13 do	pek sou	1040	47
24	,,	140	1 hf-ch	dust	70	34
25	F B B	142	5 ch	bro pek	500	53
26	,,	144	3 do	pekoe	300	48
27	,,	146	9 do	pek sou	900	44
28	Daphne	148	6 do	bro pek	600	51
29	,,	150	5 do	pekoe	500	45
30	,,	152	7 do	pek sou	700	41
31	Beau Séjour	154	7 ch	bro pek	700	59
32	,,	156	14 do	pekoe	1260	48
33	,,	158	4 do	pek sou	400	44
34	,,	160	1 do	sou	100	42
35	,,	162	2 do	unas	200	45
36	,,	164	2 hf-ch	dust	140	33
37	H	166	10 do	bro pek	500	51
38	H	168	7 do	pek sou	332	45
39	H	170	4 do	sou	184	43
40	H	172	2 do	congou	85	35
41	H	174	1 do	dust	60	37
43	Downside	178	9 hf-ch	pekoe	500	50 bid
44	,,	180	10 do	pek sou	810	49
45	,,	182	2 do	sou	850	41
46	,,	184	1 do	dust	70	33
47	L G E	186	11 ch	or pek	1100	60
48	,,	188	8 do	pekoe No. 1	800	51
49	,,	190	2 hf-ch	dust	170	32
50	Blairgowrie	192	33 do	bro pek	1650	62 bid
51	,,	194	14 ch	pekoe	1330	52
52	,,	196	10 do	pek sou	950	49
53	,,	198	4 hf-ch	bro tea	172	36
54	,,	200	1 do	dust	80	33
55	Navaheeua	202	47 do	bro pek	2350	64
56	,,	204	11 do	pekoe	495	52
57	,,	206	45 do	pek sou	2025	49
58	N A	208	1 do	congou	45	40
59	St. Catherine	210	10 ch	bro pek	900	58
60	,,	212	6 do	pekoe	540	48
61	,,	214	6 do	pek sou	510	47
62	Pantiya	216	5 do	bro tea	330	43
63	,,	218	1 hf-ch	red leaf	44	37
64	,,	220	1 do	dust	52	33
65	Iddegodda	222	3 ch	bro tea	174	44
66	,,	224	1 box	red leaf	20	35
67	,,	226	1 do	dust	22	30
68	Yahalakelle	228	23 hf-ch	bro pek	1150	61
69	,,	230	27 do	pekoe	1296	53
70	,,	232	30 do	pek sou	1440	49
71	,,	234	6 do	unas	300	47
72	,,	236	5 ch	dust	380	34
73	P	238	2 hf-ch	unas	100	43
74	A B C	240	5 do	bro pek	300	84
75	,,	242	10 do	pekoe	550	63
76	,,	244	4 do	pek sou	220	50
77	Keenagaha Ella	246	2 do	fans	130	41
78	,,	248	1 do	sou	55	39
79	Ferndale	250	8 ch	bro pek	800	72
80	,,	252	16 do	pekoe	1600	52
81	Talgaswela	254	2 do	congou	190	42
82	L	256	5 do	bro pek	500	43
83	L, in estate mark	258	1 hf-ch	or pek	34	62
84	,,	260	1 do	pek sou	40	44
85	Caledonia	262	12 ch	pekoe	1200	49
86	,,	264	17 do	bro pek	700	57
87	,,	266	1 do	bro pek sou	100	44
88	,,	268	1 hf-ch	bro tea	55	34
89	Doonevale	270	9 ch	bro pek	900	58
90	,,	272	25 do	pekoe	2250	50
91	Alnoor	278	31 hf-ch	pek sou	1550	50
92	N M	280	1 ch	red leaf	125	36
93	,,	282	1 do	bro tea	80	37
94	Chalmers	284	21 do	bro pek	1470	57
95	,,	286	39 do	pekoe	2340	51
96	,,	288	20 do	pek sou	1200	47
97	Chalmers	290	6 ch	fans	540	42
98	,,	292	1 do	dust	100	33
99	,,	294	1 do	bro mix	75	38
100	Panalkande	296	2 hf-ch	bro pek	90	50
101	,,	298	2 do	pekoe	90	42
102	,,	300	8 do	pek sou	400	39
103	Rambodde	302	16 do	bro pek	880	77
104	,,	304	20 do	pekoe	1000	60
105	,,	306	22 do	pek sou	1100	51
106	,,	308	2 do	congou	100	42
107	,,	310	1 do	dust	74	36
108	Derby	312	2 ch	bro pek	200	51
109	,,	314	5 do	pekoe	450	50
110	,,	316	5 do	pek sou	425	48
111	,,	318	1 do	sou	85	41
112	,,	320	1 hf-ch	dust	70	33
113	Kelliewatte	322	1 do	dust	75	30
114	B F B	324	2 do	unas	119	39
115	,,	326	1 do	dust	49	31
116	Thebcrton	328	25 ch	bro pek	2500	42 bid
117	Mahatenne	330	3 do	sou	275	35
118	,,	332	1 do	dust	80	33
119	Farnbam	334	22 hf-ch	pekoe	990	53
120	K	336	1 ch	pek sou	100	42
121	W G	338	1 hf-ch	pek dust	82	34
122	,,	340	1 do	red leaf	52	34
123	,,	342	1 do	pek fans	60	42
124	Yataderia	344	6 ch	or pek	588	53
125	,,	346	13 do	bro pek	1430	63
126	,,	348	37 do	pekoe	3700	49
127	,,	350	19 do	pek sou	1710	45
128	,,	352	2 do	sou	214	38
129	Clova	354	4 hf-ch	bro pek	200	63
130	,,	356	9 do	pekoe	450	51
131	,,	358	25 do	pek sou	1175	47
132	H & H	360	2 ch	bro mix	180	34
133	Galkadua	362	14 hf-ch	bro pek	700	57
134	,,	364	22 do	pekoe	1100	48
135	,,	366	14 do	pek sou	700	43
136	Hunasgeria	368	7 do	dust	560	10
137	Monrovia	370	14 hf-ch	bro pek	700	64
138	,,	372	12 ch	pekoe	1200	
139	,,	374	7 do			49
			1 hf-ch	pek sou	750	43
140	,,	376	2 ch	unas	200	44
141	,,	378	1 do	bro mix	104	38
142	,,	380	1 do	dust	136	33
143	E K	382	1 hf-ch	bro pek	50	54
144	,,	384	1 do	pekoe	60	42
145	,,	386	1 do	pek sou	56	42
146	,,	388	1 do	unas	56	41
147	B & D	390	3 ch	dust	510	33
148	,,	392	1 do	red leaf	105	29
149	Craighead	394	30 hf-ch	bro or pek	1500	64
150	,,	396	19 ch	pekoe	1710	54
151	,,	398	21 do	pek sou	1785	47
152	,,	400	6 do	sou	510	43
153	Court Lodge	402	22 hf-ch	bro pek	1232	92
154	,,	404	21 do	pekoe	966	76
155	,,	406	22 do	pek sou	990	62
156	,,	408	1 ch	sou	76	48
157	,,	410	1 do	dust	150	35

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 18th Feb., the undermentioned lots of Tea (87,590 lb.), which sod as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Heatherton	33	3 hf-ch	bro tea	135	35
2	Do	34	1 do	dust	82	32
3	Morning-side	35	5 do	bro pek	250	62
4	Do	36	19 do	pekoe	950	50
5	Do	37	6 do	pek sou	300	43
6	Do	38	1 do	dust	60	30
7	Do	39	2 do	bro mix	88	29

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
8	Yahalatenne	40	6 hf-ch	bro pek	360	59
9	Do	41	10 ch	pekoe	900	50
10	Do	42	6 do	pek sou	540	47
11	R X	43	1 do	bro mix	120	37
12	Do	44	2 do	bro tea	240	38 bid
13	Do	45	2 do	pek dust	280	34
14	Do	46	1 do	dust	140	32
18	Manickande	50	8 hf-ch	bro pek	400	60
19	Do	51	34 do	pekoe	1707	70
20	Do	52	7 ch	pek sou	709	41
22	Do	54	2 do	dust	289	31
23	Eilandhu	55	15 ch	bro pek	1200	58
24	Do	56	15 do	pekoe	1200	48
25	Do	57	1 hf-ch	dust	70	31
26	T R W, in estate mark	58	14 ch	bro pek	1400	63
27	Do	59	16 do	pekoe	1360	51
28	Do	60	17 do	pek sou	1360	47
29	Wishford	61	8 do	bro pek	880	58
30	Do	62	6 do	bro or pek	660	64
31	Do	63	11 do	pekoe	1100	50
32	Do	64	7 do	pek sou	700	47
33	Do	65	2 do	dust	180	33
34	Vincit	66	6 do 1 hf-ch	bro or pek	690	58
35	Do	67	9 ch	or pek	900	51
36	Do	68	12 do	pekoe	1200	46
37	Do	69	7 do	pek sou	700	42
38	Do	70	1 do	congou	100	32
39	Do	71	6 hf-ch	dust	420	32
40	Malgolla	72	26 do	bro pek	1430	60 bid
41	Do	73	54 do	pekoe	2700	52
42	Do	74	101 do	pek sou	4515	48
43	Do	75	15 do	bro tea	825	45
44	Allakolla	76	22 do	bro pek	1430	61
45	A A	77	7 do	pekoe	385	41
46	Do	78	1 ch	bro tea	90	26
52	St. Andrews T N C	84	16 do	or pek	1056	73 bid
53	Do	85	16 do	bro pek	1040	54 bid
54	Do	86	34 do	pekoe	2176	52 bid
55	Blairavon	87	15 ch	bro pek	1500	62 bid
56	T C A	88	8 do	unas	1040	40 bid
57	Do	89	3 do	fans	555	35
58	M K A, in estate mark	90	15 do	or pek	1500	58 bid
59	Forest Hill	91	14 do	pekoe	1260	49
60	T, in estate mark	92	17 hf-ch	unas	884	44
61	Silverton	93	40 box	bro pek	720	59 bid
62	Do	94	28 hf-ch	pekoe	1540	47
63	Do	95	2 do	pek fans	140	37
64	S A	96	13 do	pek sou	780	44 bid
65	W A P, in estate mark	97	23 do	bro pek	1150	34 bid
66	Do	98	4 ch	pekoe	402	45
67	P W E G, in estate mark	99	12 hf-ch	or pek	600	60
68	Do	100	16 do	pekoe	736	48
69	Do	1	15 do	pek sou	600	44
70	Do	2	1 do	dust	70	33
71	N K	3	16 do	bro pek	1120	64
72	Do	4	15 do	pekoe	675	49
73	Do	5	6 do	pek sou	270	40
74	E K L	6	7 do	or pek	350	52
75	Torrington, M	7	10 do	bro or pk	600	71
76	Do	8	19 do	bro pek	1045	54 bid
77	Do	9	23 do	pekoe	1150	50
78	Do	10	16 do	pek sou	800	46
79	Do	11	3 do	dust	270	34
80	H P	12	3 ch	pekoe	297	38
81	Do	13	1 do	pek sou	77	32
82	Do	14	1 hf ch	bro tea	60	30
83	Do	15	1 ch	red leaf	103	29
84	Kesbewa	16	11 hf-ch	bro pek	550	32 bid
85	Do	17	53 do	pek sou	1855	30
86	Do	18	3 do	dust	225	30
93	F	25	4 ch	bro tea	372	31
94	F	26	3 do	bro pek sou	219	34
95	F	27	2 do	red leaf	170	32
96	B G A	28	9 hf-ch	bro pek sou	540	43
97	D	29	12 do	bro or pek	600	60 bid
98	Readings	30	24 do	bro pek	1200	55 bid
99	Do	31	31 do	pekoe	1395	49 bid
100	Do	32	25 do	pek sou	1125	45 bid
101	Lyndhurst	133	17 ch	pekoe	1615	45 bid
104	N	136	4 do	pek sou	300	40 bid
105	N	137	4 do	bro tea	320	33
106	N	138	1 do	pek dust	145	34
107	Baseldon	139	8 hf-ch	bro pek	400	56 bid
108	Do	140	30 do	pekoe (A)	1350	44 bid
109	Do	141	24 do	pekoe (B)	1212	44 bid
110	D	142	2 ch	pek fans	140	33
111	D A	143	46 hf-ch	bro mix	2120	35
112	Do	144	2 do	red leaf	95	30
113	M S	145	3 do 1 box	bro tea	167	36
114	Roseneth	146	1 ch	dust	85	33

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, January 30th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 30th Jan.:—

Ex "Ghingwo"—Ouvah GA, 1c 1b 111s 6d; 2c 1t 108s; 1b 102s; 1b 128s; 1t 124s; 1b 98s; 2b 106s.

Ex "Kaisow"—Ouvah JB, 1c 1b 111s; 2c 1b 108s 6d; 1b 102s; 1b 133s; 1b 128s; 1t 99s; 2b 106s.

Ex "Oopack"—Rajawelle, 1c 104s; 1c 100s 6d; 1b 96s. Rajawelle L 1 B, 5b 92s 6d; 1b 65s.

CEYLON CINCHONA SALES IN LONDON.

(*From Wilson, Smithett, & Co.'s Circular.*)

MINCING LANE, Jan. 30th, 1891.

Mark.	Natural Stem.	Renewed.	Root.
Dromoland	3d	3d to 3½d	...
Meddecombra	...	...	3d
Derry Clare	2d	...	...
Doomoo	1¾d to 2d	2½d to 5d	...
S T & L C, A in diamond	2d to 3d	...	...
Wariagalla Quill 5½d to 8d	3d to 3½d	4d	...
Roeberry	3d to 3½d	...	..
Dunbar	...	...	2½d
E P C	3d	2½d	...
Condegalla	...	4d	...
Diyagama	3d	4d	...
IMP in diamond	2d to 2½d	3d	...
Queensland	...	...	2¼d to 2½d
HB, M in diamond	1d	...	...
Battagalla	2½d	4d to 4½d	3½d to 4d
Kobanella	1½d to 1¾d	3d	1¾d
Middleton Dimbula	1¾d to 2½d	2d to 2½d	...
Kotiyagalla	2d	2d	4½d
Rookwood	1½d to 2d	...	2½d
OFFICINALIS.			
Dukinfield	4d	7d to 7½d	5½d
Diyagama	3d to 3½d	4¼d to 5d	...
Gracelyn	4½d	6½d to 7d	7d to 7½d
M C C Co in dia.	3d to 3½d	6d to 8d	...
" " hyd.	...	5½d to 5½d	...
Coneygar	2d	3½d	5½d to 6d
Stafford	3d	5½d	...
Craig	3¼d to 3½d	..	...
Goomera Ledger	4½d	...	...
Tulboddy	...	7½d	...

CEYLON COCOA SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Jan. 30th, 1891.

Ex "Prometheus"—Mahaberia (OBEC), 60 bags 118s 6d; 6 48s; 2 82s 6d; 35 105s; 1 70s; 7 45s. SD,1 bag 37s.

"CEYLON OBSERVER" PRESS, COLOMBO.

TEA, COFFEE, CINCHONA, COCOA, AND CARDAMOM SALES.

No. 7.] COLOMBO, MARCH 9, 1891. { PRICE :—12½ cents each 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 18th Feb., the undermentioned lots of Tea (71,363 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	D E	147	6	hf-ch	fans	504	38
2	Do	148	7	do	unas	413	50
3	Killaloo	149	12	do	sou	1070	38
4	Kande-newera	151	19	ch	bro or pek	1710	55 bid
5	Do	153	14	do	pekoe	1120	48 bid
6	Do	155	47	do	pek sou	4230	46
7	Gouravilla	157	56	hf.ch	or pek	3360	61 bid
8	Do	159	28	ch	pekoe	2800	50 bid
9	Do	161	6	do	pek sou	600	47
0	Do	162	2	do	bro mix	200	44
11	Do	163	2	do	dust	160	33
12	Albion	164	27	do	bro pek	2970	71
13	Do	166	31	do	pekoe	3100	55
14	Do	168	54	do	pek sou	5130	50
15	Do	170	4	do	sou	384	44
16	Do	171	5	do	dust	780	35
17	Do	172	1	do	dust	150	33
18	F T	173	27	do	bro pek	2700	56 bid
19	Do	175	16	do	pek sou	1600	47
20	Deeside	177	28	hf-ch	bro pek	1680	70
21	Do	179	20	ch	pekoe	1800	52 bid
22	Do	181	9	do	pek sou	900	49
23	Mocha	163	26	hf-ch	bro pek	1430	72
24	Do	185	20	ch	pekoe	2000	59
25	Do	187	13	do	pek sou	1235	50
26	Do	189	12	do	sou	1140	44
27	Fernlands	191	3	hf-ch	bro pek	180	70 bid
28	Do	192	13	do	pekoe	715	53 bid
29	Do	194	15	ch	pek sou	1500	48
30	Do	196	3	hf-ch	bro pek sou	138	38
31	Do	197	3	do	bro tea	180	35
32	Beaumont, W	198	15	ch	bro pek	1530	61 bid
33	Do	200	12	do	pekoe No. 1	1080	50
34	Do	202	13	do	pekoe	1287	46
35	Gonakelle	204	3	hf-ch	bro or pek	150	70
36	Do	205	3	do	pekoe	150	52
37	Maddeged-dera	206	36	do	bro pek	2016	58
38	Do	208	49	do	pekoe	2450	49
39	Do	210	1	do	sou	60	35
40	Do	211	3	do	dust	246	32
41	D F, in estate mark	212	31	ch	bro pek	3255	57
42	Do	214	24	do	pekoe	2280	50
43	Do	216	25	do	pekoe No. 2	2375	46
44	Do	218	30	do	pek sou	2700	45
45	Do	220	12	do	fans	1260	33

Messrs A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 25th Feb., the undermentioned lots of Tea (50,726 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	A S C	1	5	hf-ch	fans	245	45
2	Do	2	4	do	red leaf	200	33
3	Do	3	1	do	dust	60	33
4	D E C	4	10	do	red leaf	500	33
5	K	5	36	hf-ch	bro pek	1980	65
6	Norton	7	27	do	bro pek	1485	66 bid
7	Do	9	47	do	pekoe	2350	52 bid
8	Do	11	21	do	pek sou	1050	46 bid
9	Do	13	5	do	dust	300	34
10	Patulpana	14	7	do	bro pek	350	48
11	Do	16	9	do	pek sou	450	40
12	Do	18	1	do	bro mix	50	37
13	Nahalma	19	33	do	bro pek	1815	58
14	Do	21	30	ch	pekoe	3000	45 bid
15	Do	23	15	hf-ch	pek sou	750	41 bid
16	Do	25	1	do	dust	75	34
17	Hakurugalla	26	7	ch	bro pek	700	56 bid
18	Do	28	12	do	pekoe	1080	46 bid
	Do	30	8	do	pek sou	720	42 bid
20	Woodend	32	16	ch	bro pek	1680	58
21	Do	34	15	do	pekoe	1500	45 bid
22	Do	36	3	do	pek sou	300	40 bid
23	Do	37	1	do	dust	135	32
24	Shannon	38	16	hf-ch	bro pek	880	62
25	Do	40	7	ch	pekoe	630	43 bid
26	Do	42	4	do	pek sou	360	46 bid
27	Do	43	1	hf-ch	bro tea	45	33
28	Ossington	44	10	do	bro pek	500	49 bid
29	Do	46	10	do	pekoe	500	42 bid
30	N	48	6	do	pekoe	291	41 bid
31	W M	49	24	do	bro pek	1320	62 bid
32	Do	51	11	ch	pekoe	1210	50
33	H G A	53	8	do	bro pek	800	57
34	Do	55	35	do	pekoe	3325	48
35	F H B	57	33	hf-ch	bro pek	1815	58
36	Do	59	35	do	bro pek	1925	59
37	Do	61	34	ch	pekoe	3400	46 bid
38	Do	63	35	do	pekoe	3500	46 bid
39	K O	65	1	ch	pek sou	100	42
40	Y D, in estate mark	67	77	do	pekoe	6545	46 bid
41	Do	69	4	do	dust	600	33
47	Kundoo	77	32	do	bro pek	3200	56
48	Do	79	30	do	pekoe	3000	45
49	Do	81	48	do	pek sou	4800	39
50	Do	83	4	do	congou	400	35
51	Do	84	2	do	bro mix	190	32
52	Do	85	3	do	dust	450	33

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room today, 25th Feb., the undermentioned lots of Tea (80,530 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Hattangalla	222	1	hf-ch	bro pek	38	61
2	Do	223	1	do	pekoe	65	51
3	Do	224	1	do	pek sou	31	47
4	Do	225	1	do	dust	11	34
5	N K	226	1	ch	bro pek	100	49
6	Do	227	2	hf-ch	pekoe	95	46
7	Do	228	2	ch	congou	160	40
8	Do	229	10	hf-ch	red leaf	650	31
9	Logan	231	18	do	bro pek	900	59
10	Lawrence	233	35	ch	sou	3500	36
11	Labugama	235	4	hf-ch	bro or pek	200	54
12	Do	236	12	do	bro pek	480	61
13	Do	238	30	do	pekoe	1200	48
14	Do	240	23	do	sou	920	44
15	Do	242	10	do	pek fan	450	41
16	Do	244	1	do	congou	40	36
17	Do	245	4	do	red leaf	200	35
18	Do	246	1	do	pkedust	75	35
19	Gouravilla	247	56	do	or pek	3360	59
20	Do	249	28	ch	pekoe	2800	49
21	Hattangalla	251	12	do	bro pek	1272	61
22	Do	253	19	do	pekoe	1805	48 bid
23	Do	255	14	do	pek sou	1330	44 bid
24	Galgawatte	257	36	hf-ch	bro bek	1800	57 bid
25	Do	259	20	ch	pekoe	2000	46 bid
26	Do	261	12	do	pek sou	1200	43 bid
27	Tientsin	263	25	hf-ch	bro pek	1500	63 bid
28	Do	265	12	ch	pekoe	1080	49 bid
29	Do	267	23	do	pek sou	2070	44 bid
30	Kande-newera	269	14	do	pekoe	1120	47
31	Orange Field P N R	271	5	do	bro pek	500	58
32	Do	273	25	do	pekoe	2375	45
33	Do	275	3	do	sou	270	35
34	Do	276	1	hf-ch	dust	65	35
35	Ottery	277	22	ch	bro pek	2200	64 bid
36	Do	279	34	do	pekoe	3060	52 bid
37	Do	281	14	do	pek sou	1260	47
38	Do	283	3	do	bro mix	390	32
39	E W	284	5	hf-ch	red leaf	225	30
40	Do	285	15	do	congou	700	37
41	Do	287	10	do	dust	700	34
42	Cruden Factory	289	25	do	sou	1250	38
43	B T	10	20	ch	bro mix	1800	37

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
44	Alliady	12	2 ch	or pek	190	55
45	Do	13	2 do	bro pek	260	57
46	Do	14	6 do	pekoe	720	46
47	Do	16	7 do	pek sou	770	42
48	Brownlow	18	17 do	bro pek	1785	61 bid
49	Do	20	17 do	pekoe	1615	50 bid
50	Do	22	11 do	pek sou	990	45 bid
51	Do	24	1 do	dust	70	34
52	Albion	25	22 do	bro pek	2420	66 bid
53	Do	27	22 do	pekoe	2200	53 bid
54	Do	29	29 do	pek sou	2755	48 bid
55	Do	31	2 do	red leaf	130	34
56	Dickapittia	32	16 do	bro pek	1936	59
57	Do	34	19 do	pekoe	1900	47 bid
58	Do	36	1 hf-ch	sou	62	40
59	Do	37	1 ch	dust	112	34
60	Eltofts	38	51 hf-ch	bro pek	3060	70 bid
61	Do	40	21 ch	pekoe	1890	55 bid
62	Do	42	32 do	pek sou	3200	49 bid
63	Agra Ouvah	44	24 hf-ch	bro pek	1200	59
64	Do	46	31 do	pekoe	1395	48
65	Great Valley	48	20 ch	bro pek	2200	61
66	Do	50	23 do	pekoe	2300	51 bid
67	Do	52	17 do	pek sou	1615	47 bid
68	Do	54	1 do	congou	110	38
69	Do	55	5 hf-ch	dust	400	33

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 25th Feb., the undermentioned lots of Tea (76,304 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Lyndhurst	47	3 ch	dust	360	33
2	Do	48	6 do	red leaf	564	31
3	S	49	1 hf-ch	congou	35	37
4	S	50	1 ch	dust	135	32
11	Harmony	57	17 do	bro pek	850	62
12	Do	58	15 ch	pekoe	1350	50
13	Do	59	8 do	pek sou	720	44
14	Do	60	2 hf-ch	bro mix	90	34
15	Do	61	3 do	pek fan	210	38
16	Kattukitula	62	2 do	bro pek	80	58
17	Do	63	3 do	pekoe	168	48
18	Do	64	4 do	pek sou	188	43
25	Depedene	71	15 do	bro pek	750	64
26	Do	72	31 do	pekoe	1550	53
27	Do	73	33 do	pek sou	1650	46
28	H D	74	57 do	bro tea	2850	39
29	Do	75	4 do	bro mix	200	30
30	Do	76	10 do	pek sou	500	45
31	Hatdowa	77	7 do	bro pek	350	54
32	Do	78	19 do	bro tea	950	44
33	Do	79	1 do	congou	50	38
34	Allakolla	80	12 do	bro pek	780	63
35	Do	81	12 ch	pekoe	1260	51
36	Do	82	6 do	pek sou	600	44
37	B R	83	1 hf-ch			
			4 box	pekoe	187	40
38	Do	84	1 hf-ch			
			4 box	pek fans	336	26 bid
39	Do	85	7 hf-ch	dust	626	32
40	P M	86	1 ch			
			1 hf-ch	bro tea	144	34
41	Do	87	1 ch	red leaf	87	28 bid
42	R B A, Star in estate mark	88	14 hf-ch	pekoe	760	50
43	Narangoda	89	16 ch	unas	1600	52 bid
44	Do	90	1 do	sou	75	38
45	Do	91	1 hf-ch	dust	65	33
46	E A T S, Cross in estate mark	92	5 ch	bro pek	550	59 bid
47	Do	93	6 do	pekoe	570	46
48	Do	94	3 do	pek sou	285	48
49	Ederapolla	95	39 hf-ch	bro pek	1950	60
50	Do	96	25 do	pekoe	2250	49
51	Do	97	14 ch	pek sou	1260	45
52	E D P	98	13 do	sou	1170	44
53	Do	99	5 hf-ch	bro tea	275	44
54	Do	100	2 do	pek dust	150	33
55	I N G, in estate mark	1	6 ch	bro pek	600	68
56	Do	2	5 do	bro mix	500	41
57	Do	3	1 do	dust	100	34
58	Abbotsford	4	18 hf-ch	bro or pek	1080	66 bid
59	Do	5	31 ch	bro pek	255	57 bid
60	Do	6	21 do	pekoe	2100	54 bid
61	Do	7	13 do	pek sou	1300	46 bid
62	Hiralouvah	8	17 ch	bro pek	1832	58 bid
63	Do	9	19 do			
			1 hf-ch	pekoe	1950	47 bid
64	Do	10	5 ch	sou	544	43
65	Do	11	1 do	fans	98	39
66	Do	12	2 hf-ch	dust	143	34
67	P D M	13	12 ch			
			1 hf-ch	bro tea	1260	40
68	Roseneath	14	19 do	bro pek	1330	57 bid
69	Do	15	12 ch	pekoe	1320	48
70	Do	16	13 do	pek sou	1430	43 bid
71	Killin	17	15 do	bro pek	1500	56 bid
72	Do	18	16 do	pekoe	1520	46 bid
73	Do	19	12 do	pek sou	1080	44 bid
74	Do	20	3 do	bro tea	300	36
75	Do	21	1 do	pek dust	100	33
76	Do	22	1 do	dust	100	33
77	G	23	1 do	or pek	90	44
78	G	24	5 do	pekoe	400	43 bid
79	G	25	3 do	pek sou	300	40
80	Keenawatte	26	2 hf-ch	bro pek	100	52
81	Do	27	14 do	uuas	700	39 bid
82	G W A	28	4 do			
			1 ch	bro or pek	283	53
83	Do	29	4 hf-ch	pekoe	200	46 bid
84	Do	30	1 do	pek sou	50	40
85	N	31	3 ch			
			1 hf-ch	or pek	315	40 bid
86	N	32	13 do	pek sou	650	32
87	Kesbawa	33	60 do	pekoe	2100	29
92	N B	38	35 do	pekoe	1890	47 bid
93	B	39	1 do	pekoe	41	42
94	B	40	1 do	pek sou	43	38
95	Torrington M	41	19 do	or pek	1045	57 bid
96	X X X	42	5 ch	sou	500	38
97	Do	43	4 do	congou	388	34
98	Do	44	10 hf-ch	pek dust	800	32
99	H G H	45	1 do	bro pek	50	45
100	Do	46	1 do	pekoe	50	42
101	Do	147	3 do	pek sou	150	38
102	Do	148	1 do	fans	50	30
103	D	149	12 do	bro or pek	600	60 bid
104	Lowood	150	10 do	bro pek	500	50 bid
105	Do	151	6 ch	pekoe No. 1	600	41 bid
106	Do	152	6 do	pekoe	538	40 bid
107	K G A	153	3 do	bro pek	300	56 bid
108	Do	154	6 do	pekoe	480	45 bid
109	Do	155	6 do	pek sou	480	28 bid
111	A	157	6 do	bro pek	600	29
112	G	158	8 do	pekoe	1040	50
113	E	159	12 do	pekoe	1200	out

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 25th Feb., the undermentioned lots of Tea (103,521 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	S B R	412	3 ch	dust	420	33
2	Halpantenne	414	10 hf-ch	bro pek	500	57
3	Do	416	8 do	pekoe	390	48
4	Do	418	30 do	pek sou	1500	43
5	Kirrimettia L M	420	16 do	bro pek	800	63
6	Do	422	45 do	pekoe	2240	48
7	Do	424	4 do	pek sou	195	44
8	Do	426	5 do	pek fans	350	38
9	Theydon Bois	428	4 ch	bro pek	400	60
10	Do	434	6 do	sou	510	38
11	Shrubs Hill	436	12 do	bro pek	1200	62
12	Do	438	12 do	pekoe	1140	52
13	Do	440	15 do	pek sou	1275	47
14	Do	442	1 hf-ch	sou	45	40
15	Do	444	1 do	dust	70	36
16	Meddetenne	446	5 ch	bro pek	525	60
17	Do	448	10 do	pekoe	900	48
18	Do	450	1 do	dust	145	38
19	Do	452	1 do	unas	90	45
20	Kolaoya	454	45 hf-ch	pekoe	2265	45 bid
21	W A	456	6 do	pekoe	300	43
22	Alnoor	458	18 do	bro pek	900	64
23	Do	460	18 do	pekoe	900	49
24	Do	462	6 do	dust	300	38
25	Do	464	7 do	congou	350	40
26	Clyde	466	1 box	dust	22	34

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
27	Yataderia	468	7 ch	or pek	665	50
28	Do	470	21 do	bro pek	2310	61
29	Do	472	27 do	pekoe	2700	48 bid
30	Do	474	23 do	pek sou	2070	48
31	Chesterford	476	20 hf-ch	bro pek	1200	59
32	Valley	478	5 ch	pekoe	500	42
33	Amblakande	480	10 do	bro or pek	1000	61 bid
34	Do	482	15 do	pekoe	1350	49 bid
35	Do	484	9 do	sou	810	40
36	Do	486	1 do	bro mix	120	34
37	Ragalla	488	24 ch	bro pek	2400	65 bid
38	Do	490	24 do	pekoe	2160	48 bid
39	Do	492	7 do	dust	560	39
40	Do	494	9 do	sou	405	42
41	Do	496	11 do	pek sou	1045	45 bid
42	Queensland	498	4 do	pek fans	300	36
43	Avisawella	500	12 do	bro pek	1200	61 bid
44	Do	502	13 do	pekoe	1170	47 bid
45	Do	504	33 do	pek sou	2970	44
46	Cocogalla	506	23 hf-ch	bro pek	1380	72
47	Do	508	19 do	pekoe	1064	52
48	Do	510	7 do	pek sou	392	49
49	D A	512	6 ch	pekoe	593	45
50	Do	514	2 do	bro mix	196	30
51	G M B	516	9 hf-ch	bro pek	540	60
52	Do	518	11 do	pekoe	660	51
53	Do	520	1 ch	bro mix	60	42
54	Mukeloya	522	7 hf-ch	bro pek	420	67
55	Do	524	17 do	pekoe	1020	52
56	Do	526	11 do	pek sou	660	45
57	Do	528	1 do	dust	80	36
58	Attabage	530	59 do	bro pek	2950	62
59	Do	532	59 ch	pekoe	5310	48 bid
60	Do	534	28 do	pek sou	2520	44
61	Do	536	7 hf-ch	bro mix	315	36
62	Do	538	10 ch	pek fan	700	38
63	Middleton	540	39 hf-ch	bro pek	2535	62
64	Do	542	22 ch	pekoe	2420	51
65	Do	544	1 do	congou	112	39
66	Galkadua	546	4 hf-ch	bro pek	200	54
67	Do	548	8 do	pekoe	400	48
68	Do	550	9 do	red leaf	450	34
69	O H O	552	3 do	bro or pek	180	60
70	Do	554	5 ch	pekoe	475	47
71	Do	556	5 do	pek sou	500	44
75	L	564	5 hf-ch	bro tea	250	34
76	L	566	2 do	pek dust	120	35
77	Silver Valley	568	1 do	bro pek	50	61
78	Do	570	6 do	pekoe	300	47
79	Do	572	1 do	red leaf	50	39
80	Bandara-polla	574	29 do	bro pek	1450	65
81	Do	576	37 do	pekoe	1850	48
82	Do	578	23 do	pek sou	1035	46
83	Handoro-kanda	580	1 do	congou	46	37
84	Do	582	1 do	red leaf	30	28
85	Do	584	1 do	dust	48	34
86	Do	586	7 do	pek sou	350	41
87	Do	588	2 do	pekoe	100	46
88	Do	590	3 do	bro pek	150	49
92	Warwick	598	27 do	or pek	1485	63 bid
93	Do	600	36 do	pekoe	1800	54
94	Do	2	4 do	dust	320	34
5	Do	4	2 do	congou	90	40
96	Dehiowitta	6	13 ch	bro pek	1365	66
97	Do	8	23 do	pekoe	2300	48
98	Do	10	11 do	pek sou	1045	45
99	Do	12	1 do	bro tea	120	38
100	Thebertou	14	25 ch	bro pek	2500	50
101	Do	16	22 do	pekoe	2200	43
102	Do	18	3 do	red leaf	300	35
103	Gona Adika	20	2 hf-ch	red leaf	100	36
109	B, in estate mark	32	11 do	pekoe	622	43
110	C B	34	7 ch	bro sou	700	45
111	Do	36	4 hf-ch	dust	320	33
112	Do	38	1 do	red leaf	50	38

Mr. E. John put up for Sale at the Chamber of Commerce Sale-room today; 4th March, the undermentioned lots of Tea (58,160 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	G	56	8 hf-ch	bro tea	400	36
2	B K	57	1 ch	bro or pek	76	63
3	Do	58	4 do	bro tea	410	37
4	Do	60	11 hf-ch	dust	1066	35
5	Faithlie	62	11 ch	bro pek	1210	58 bid
6	Do	64	17 do	pekoe	1350	51
7	Do	66	15 do	pek sou	3950	44 bid
8	Do	68	1 do	sou	90	37
9	Do	69	1 do	bro mix	85	34
10	Do	70	3 hf-ch	dust	225	36
11	Anchor, in estate mark	71	12 ch	bro pek	1380	62 bid
12	Do	73	25 do	pekoe	2500	54
13	Do	75	17 do	pek sou	1700	47
14	Deeside	77	29 hf-ch	bro pek	1740	64 bid
15	Do	79	19 ch	pekoe	1805	55
16	Do	81	13 do	pek sou	1300	47
17	Dunbar	83	19 do	bro pek	1995	58 bid
18	Do	85	27 do	pekoe	2430	47 bid
19	Do	87	2 do	dust	260	34
20	Hattangalla	88	19 do	pekoe	1805	47
21	Killaloo	101	25 do	sou	2250	35
22	Cruden Factory	103	40 do	or pek	4000	61 bid
23	Do	105	33 do	pekoe	3300	48 bid
24	Do	107	5 do	pek sou	500	43 bid
25	Maria	108	17 do	bro pek	1870	60 bid
26	Do	110	18 do	pek sou	1800	47 bid
27	Madool-tenne	112	12 ch	bro pek	1320	51 bid
28	Do	114	14 do	pekoe	1400	45 bid
29	Do	116	12 do	pek sou	1200	43
32	Logan	120	27 hf-ch	bro pek	1350	61 bid
33	Do	122	25 do	pekoe	1125	49 bid
34	Do	124	44 do	pek sou	1980	46
35	Do	126	8 do	sou	360	39
36	Do	127	7 do	dust	420	35
37	Albion	128	25 ch	bro pek	2750	64 bid
38	Do	130	22 do	pekoe	2200	55
39	Do	132	25 do	pek sou	2400	47 bid
40	Ayr	134	2 hf-ch	bro pek No. 1	100	41
41	Do	135	19 do	bro pek No. 2	855	60 bid
42	Do	137	26 do	pekoe	1040	46 bid
43	Do	139	32 do	pek sou	1344	45
44	Do	141	4 do	congou	160	37
45	Do	142	4 do	fans	160	37
46	Do	143	1 do	pek dust	54	32

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 4th March, the undermentioned lots of Tea (39,920 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	P	60	13 ch	dust	2080	33
2	P	61	11 do	bro mix	1100	36
3	Wewesse	62	8 hf-ch	bro pek	400	61
4	Do	63	15 do	pekoe	750	49
5	Do	64	12 do	pek sou	600	44
6	Do	65	3 do	sou	152	40
7	Do	66	1 do	pek fans	60	63
8	Do	67	1 do	dust	75	34
9	B, in estate mark	68	3 do	bro pek	150	54
10	Do	69	4 do	pekoe	200	43
11	Do	70	5 do	pek sou	200	40
12	M C K	71	37 do	pekoe	1876	51 bid
13	Weregalla	72	12 ch	bro pek	1200	57 bid
14	Do	73	14 do	pekoe	1190	49
15	Do	74	14 do	pek sou	1120	44
16	Do	75	2 hf-ch	dust	150	31
17	C A, in estate mark	76	4 do	unas	220	43
18	Do	77	4 do	bro mix	224	37
19	P W E G, in estate mark	78	9 do	or pek	450	54 bid
20	Do	79	13 do	pekoe	598	46 bid
21	Do	80	8 do	pek sou	336	42 bid
22	Do	81	1 do	dust	70	34
23	K	82	3 do	pekoe	156	44
24	A K R	83	6 ch	pekoe	600	43 bid
25	F E	84	10 hf-ch	bro pek	499	44 bid
26	D	85	5 do 1 box	pekoe	259	01
27	Yarrow	86	24 hf-ch	pek sou	1344	85
28	W T	87	8 do	bro pek	402	84
29	W A	88	6 ch	bro pek	599	43

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
30	A	89	5 ch			
			2 hf-ch	pek sou	566	39
31	A	90	7 ch	fans	1035	36
32	P B	91	2 do	bro tea	185	31
33	Do	92	1 do			
			1 hf-ch	red leaf	177	28
34	Do	93	4 do	faus	348	27 bid
35	Do	94	4 ch	dust	602	29 bid
36	P	95	9 do	bro or pek	900	55
37	P	96	6 do	pekoe	540	46
38	P	97	3 hf-ch	pek sou	135	41
39	P	98	1 ch	dust	75	33
40	New Valley	99	1 do	congou	100	36 bid
41	H F A	100	8 hf-ch	bro tea	560	36
42	St. Andrews	1	14 do	or pek	924	72
43	Do	2	45 box	or pek	900	67 bid
44	Do	3	15 hf-ch	bro pek	975	56
45	Do	4	40 do	pekoe	2560	51 bid
46	D S	5	4 do	bro pek	200	44
47	Do	6	13 do	sou	520	34
49	K	8	14 do	uoas	700	41 bid
50	A N A	9	3 ch			
			1 hf-ch	or pek	315	43
51	H L M	10	6 ch	pekoe	536	43 bid
52	Kesbewa	11	58 hf-ch	pekoe	2030	26
53	S, in estate mark	12	12 do	bro pek	660	56
54	Do	13	15 do	pekoe	810	44
55	S S	14	7 ch			
			1 hf ch	fans	990	36
56	H H K	15	17 ch	bro pek	1832	54 bid
57	Do	16	19 ch			
			1 hf-ch	pekoe	1950	48
58	G I N	17	5 ch	bro mix	500	39 bid
59	S H	18	15 do	pek sou	1275	47

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, February 6th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 6th Feb.:—

Ex "Orotava"—Middleton, Dimbula, 1b 113s; 5c 113s 6d; 2c 108s 6d; 1t 103s 6d; 1c 140s; 1t 101s.

Ex "Kaisow"—Mahauva. 1t 108s; 1c 103s 6d; 1c 102s 6d; 1b 98s; 1 sd and 2 pkd 106s; 1 95s 6d. Alloowibare, 3c 113s 6d; 3c 1b 108s; 1b 102s; 2b 135s; 1t 100s; 1b 106s; 4b 97s 6d.

Ex "Hesperia"—STCT, 1t 99s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 13th Feb.:—

Ex "Navigator"—Meddecombra, 1c 117s; 5c 1t 116s; 5c 111s; 1t 102s 6d; 1c 138s; 1t 100s 6d; 2b 112s.

Ex "Navigator"—Claremout, 2c 113s 6d: 2c 109s; 1c 134s. Manickwatte, 1c 114s; 2c 1b 109s 6d; 1c 102s 6d; 1b 130s; 1b 98s 6d. Mausagalla, 1b 112s; 3c 1b 102s 6d; 5c 109s; 1c 1b 102s; 1c 1b 133s 6d; 1c 99s 6d. Claremont, 1 bag ovtakr 107s. Manickwatte, 1 bag ovtkr 104s.

Ex "Glengarry"—(DC)OO, 1b 112s; 2c 110s 6d; 1c 1t 107s; 1b 100s 6d; 1t 121s; 1t 102s. (DC), 1 bag ovtkr 98 6d.

Ex "Navigator"—Lawrence, 1t 118s; 3c 1b 114s; 4c 110s; 1b 102s 6d; 1c 1t 138s. (LRT), 1c 102s. Lawrence, 1 bag ovtkr 97s.

Ex "Myrmidon"—Morar, 1t 117s 6d; 3c 1t 115s; 3c 110s 6d; 1b 102s 6d; 2t 115s. (MRT), 1c 1t 108s. Morar, 1 bag ovtkr 115s; 1 bag ovtkr 108s. St. Clair, 2c 115s; 2c 110s 6d; 1b 102s 6d; 1t 137s; 1b 99s; 1b 105s. Yapame, 1b 113s; 2c 1b 114s; 3c 109s; 1b 102s; 1c 136s. (YPT), 1t 100s. Yapame, 1b 108s. North Matale, 2c 100s; 3c 106s; 1b 102s; 2b 130s; 1c 1b 99s 6d; 1b 104s; 1b 1c 1b 1b 1t 95s; 1b 110s,

Ex "Myrmidon"—Wiharagalla, 1b 112s; 4c 1t 109s; 5c 106s; 1c 1t 106s; 1c 101s; 1c 1b 131s. (WHGT), 3c 1t 98s 6d.

Ex "Myrmidon"—Wiharagalla, 1b 10 s 6d; 1b 10. WHGT, 1b 101s. Gowerakellie. 1b 1c and 1b 112s 6d; 3c 109s; 1b 103s; 1t 137s. GHET, 1b 99s; 1b and 1t 00 6 ; 1b 104s 6d; 1 bag 105s 6d.

Ex "Glengarry"—P.D. M., 1c 119s; 10c 117s 6d; 2c 1b 110s: 1t 103s 6d; 2t 140s; 1c 103.

Ex "Myrmidon"—Tillicoultry, 1t 1 15s; 5c 114s 6d; 5c 111s; 1b 103s 6d; 1c 1t 136s 6d; 2t 101s 6d; 1 bag 109s. Udahena, 2c 1t 107s 6d; 1b 101s; 1b 117s; 1c 97s 6d.

Ex "Rome"—Wattegoda, 2c 115s; 2c 111s 6d; 1b 103s; 1t 138s; 1t 101s 6d.

Ex "Myrmidon"—Hylton, 2c 111s; 5c 108s; 1c 103s 6d; 1b 3s; 1 98s 6d; 2b 100s: 1b 92s; 2 bags 100s. Berragalla; 2c 1b 117s 6d; 5c 111s 6d; 1t 104s 6d; 1c 138s 1 101s 6d; 2 bags 110s. Kelburne, 5c 111s; 12c 106s 6d; 2 101s 6d; 2t 136s; 1c 1t 126s 6d; 4c 1b 96s 6d; 1 bg 106s; 1 105s; 1 94s.

CEYLON CINCHONA SALES IN LONDON.

(From Wilson, Smithett, & Co.'s Circular.)

MINCING LANE, Feb. 13th, 1891.

Mark.	Natural Stem.	Renewed.	Root.
	SUCCIRUBRA.		
Upper raoley	2½d	3½d to 4d	3d
RCW, B in diamond	2d	4d	3d
Shawlands	1¾d	...	...
ST & LC, S in diamond	...	4½d	...
Invery, mixed	2¼d	3d to 3½d	3½d
Strathdon ,,	2½d to 3d	...	...
TJE, J, D in dia.	1¾d	2½d	...
S, K	1¾d	2½d	...
Maha Uva	2d to 4d	3d to 5½d	...
Allakolla	1¾d to 2½d	...	...
WSB, N in dia.	2½d to 3d	2¼d to 2½d	...
Preston	1¾d	3½d	4d
Wannerajah	2d	...	2½d
Battagalla	2½d to 3d	4¾d	...
Roseneath, mixed	2d to 3½d	...	...
	OFFICINALIS.		
Upper Craoley	2½d	4d	...
Verelapatna	2d	...	..
S T & L C, B in diamond	...	8½d	...
S T & L C, S in diamond	...	9d	...
M C C Co., in diamond	2½d to 4d	4½d to 5d	...
Preston	2½d	4d	..
St. Leonards	2¼d	5½d to 8d	...
Oliphant	2½d to 2½d	4d	...

CEYLON COCOA SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Feb. 13th, 1891.

Ex "Prometheus"—Hylton, 47 bags 105s 6d; 9 90s; 2 71s 6d. Victoria, 24 115s 6d.

Ex "Kaisow"—Yatawatte, 40b 110s; 67 bags 110s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, Feb. 6th, 1891.

Ex "Ningchow"—Katooloya, 4 cases 1s 9d.

Ex "Goorkha"—Dangkande OBEC, 4 cases 1s 3d; 4 1s 6d.

Ex "Duke of Argyll"—Naranghena, case 1s 1d; 11 1s 8d; 1 1s 5d; 1 1s 3d. Havilland, 3 cases 1s 7d.

Ex "Clan Lamont"—Havilland. 2 cases 2s 4d.

No. 8.] COLOMBO, MARCH 19, 1891. {PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room today, 4th March, the undermentioned lots of Tea (58,224 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
6	Relugas	8	35	ch	bro pek	1925	59 bid
7	Do	10	24	do	bro pek	1320	50
8	Do	12	20	ch	pekoe	2200	49
19	Do	14	24	do	pek sou	2400	41
10	Do	16	1	do	dust	150	34
11	Horagoda	17	3	ch	bro pek	300	54 bid
12	Do	18	13	do	pekoe	1235	47
13	Do	20	1	do	red leaf	74	31
18	Ettapolla	29	17	do	bro pek	935	58
29	Do	31	31	do	pekoe	1550	47
20	D P	33	55	do	pekoe	4675	46 bid
21	Do	35	15	hf-ch	pek sou	750	42 bid
2	D G A O, in estate mark	37	20	cb	bro pek	2000	53 bid
23	Do	39	18	do	pekoe	1800	48
24	Do	41	30	do	pek sou	3000	44
25	Do	43	5	do	congou	400	36 bid
26	Do	44	2	de	bro tea	200	34
27	F H	45	7	do	bro pek	700	52 bid
28	Do	47	12	do	pekoe	1120	45 bid
29	Do	49	8	do	pek sou	720	43
30	E;G A	51	12	do	bro pek	1200	51 bid
31	Do	53	12	do	pekoe	1200	44 bid
32	Do	55	18	do	pek sou	1800	43
33	N, in estate mark	57	27	bf-ch	bro pek	1485	59 bid
34	Do	59	47	do	pekoe	23‵0	49 bid
35	Do	61	7	ch	pekoe No. 2	630	40 bid
36	P O	63	4	hf-ch	bro pek	226	55
37	Do	64	13	do	pek sou	714	43
38	Do	66	1	do	congou	50	38
39	Do	67	1	do	dust	70	32
40	Dikmukalana	68	3	do	bro pek	150	45
41	Do	69	3	do	pekoe	135	43
42	Do	70	9	do	sou	405	37
43	Do	72	4	do	dust	240	32
44	A & F L	73	3	do	sou	165	35
45	Do	74	3	do	pek fans	235	34
46	Horagoda	76	1	ch	pek sou	95	40
47	Do	77	1	do	dust	100	32
48	Nugagalla	83	11	hf-ch	bro or pek	550	63
49	Do	85	28	do	pekoe	1400	49
50	Do	87	1	do	dust	80	33

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room today, 4th March, the undermentioned lots of Tea (114,469 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Malvern	40	1	ch	unas	69	48
2	Traquair	42	3	bf-ch	bro pek	165	46
3	Do	44	3	do	pekoe	152	43
4	Do	46	8	do	pek sou	459	40
5	Do	48	1	do	congou	45	32
6	Alton	50	13	do	bro tea	585	46
7	Aigburth	52	20	ch	bro pek	2000	56 bid
8	Do	54	12	do	pekoe	1200	47 bid
9	Do	56	15	do	pek sou	1500	43
10	Do	58	2	do	dust	320	34
11	Portmore	60	34	do	bro pek	3740	60 bid
12	Do	62	13	do	pekoe	1300	48 bid
13	P	64	1	do	fans	112	35
14	Polatagama	66	31	hf-ch	bro pek	1860	59 bid
15	Do	68	58	do	pekoe	2900	46 bid
16	Do	70	48	do	pek sou	2400	46
17	Marguerita	72	15	do	bro pek	900	64 bid
18	Do	74	13	do	pekoe	650	56
19	Do	76	19	do	pek sou	1045	48
20	Bowlana	78	4	ch	bro pek	440	withd'n
21	Do	80	4	do	pekoe	400	withd'n
	Do	82	5	do	pek sou	475	withd'n
23	M' K Oya	84	8	ch	bro pek	840	57
24	Do	86	14	do	pekoe No. 1	1260	46
25	Do	88	9	do	pekoe No. 2	720	45
26	Do	90	16	do	pek sou	1280	44
27	Do	92	3	do	dust	180	37
28	Macaldenia	94	21	bf-ch	bro pek	1259	61
29	Do	96	13	do	pekoe	715	51
30	Do	98	9	ch			
			6	bf-cb	pek sou	1257	46
31	Do	100	2	ch	sou	200	40
32	Do	102	2	bf-ch	dust	148	35
33	Do	104	1	do	red leaf	28	36
34	Do	106	1	box	flowery pek	10	1·06
35	Do	108	8	hf-ch	bro pek	360	61
36	Do	110	1	do	pekoe	55	52
37	Do	112	3	ch			
			2	bf-ch	pek sou	419	48
38	Do	114	1	do	sou	50	42
39	G	116	1	do	sou	53	38
40	Gouamotava	118	1	do	bro mix	71	34
41	B T N	120	1	ch	sou	95	36
42	Do	122	1	do	dust	90	35
43	Henfold	124	10	do	sou	800	45
44	Do	126	12	do	dust	1650	37
45	Glengariffe	128	4	do	bro tea	400	44
46	Do	130	1	do	bro pek sou	100	33
47	Do	132	3	do	dust	300	34
48	Lagalla	134	2	hf-cb	dust	160	35
49	Do	136	1	do	bro mix	50	33
50	Do	138	7	do	sou	385	40
51	Ampitiya	140	2	ch	bro pek	200	46
52	Do	142	2	do	pekoe	160	38
53	Do	144	1	do	pek sou	100	38
54	Do	146	7	do	congou	665	35
55	Do	148	2	do	bro tea	200	29
56	Do	150	4	do			
			1½	do	red leaf	326	29
57	Do	152	2	do	dust	330	32
58	Digdolla	154	5	do	bro pek	500	47
59	Do	156	6	do	pekoe	600	43
60	Do	158	7	do	pek sou	700	39
61	Do	160	2	do	bro tea	200	25
62	Beau Séjour	162	5	do	bro pek	500	59
63	Do	164	14	do	pekoe	1260	48
64	Do	166	5	do	pek sou	500	43
65	Do	168	1	do	sou	100	39
68	Do	170	2	hf-ch	dust	140	35
67	I C B	172	5	do	bro pek	500	56
68	Do	174	4	do	pekoe	400	47
69	Do	176	4	do	pek sou	400	43
70	Katugalla	178	5	do	bro pek	550	58
71	Do	180	6	do	pekoe	600	48
72	Do	182	3	do	pek sou	330	43
73	A K	184	5	do	sou	500	43
74	Do	186	4	do			
			1	hf-cb	red leaf	470	37
75	Do	188	1	ch			
			1	hf-ch	dust	185	36
76	P C H Galle, in estate mark	190	3	do	bro pek	150	47
77	Do	192	1	do	pekoe	50	42
78	Do	194	6	do	pek sou	300	42
79	Do	196	1	do	congou	40	30
80	Do	198	3	do	dust	208	36
81	C, in estate mark	200	8	cb	bro tea	800	31
82	J G	202	13	do	sou	1170	42
83	Do	204	2	do	bro tea	240	34
84	L, in estate mark	206	7	do	bro tea	700	30
85	V O	208	3	do	red leaf	330	33
86	Do	210	2	do	dust	224	31
87	Doonevale	212	7	do	bro pek	700	59
88	Do	214	19	do	pekoe	1710	44
89	Do	216	1	do	fans	115	37
90	Alnoor	218	22	hf-ch	bro pek	1100	58
91	Do	220	21	do	pekoe	1050	47
92	Yataderia	222	17	ch	bro pek	1870	58
93	Do	224	42	do	pekoe	4200	47
94	Do	226	22	do	pek sou	1980	44
95	St. Leonards	228	1	do	pek sou	100	40
96	Do	230	1	bf-ch	dust	70	34
97	H	232	3	ch	bro or pek	330	55
98	H	234	2	do	pekoe	200	45

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
99	H	236	1 ch	pek sou	100	43
100	H	138	2 hf-ch	dust	100	33
101	Mausa-kane	240	13 ch	bro pek	1300	58
102	Do	242	14 do	pekeo	1260	46
103	Do	244	5 do	pek sou	450	43
104	Do	246	1 do	dust	130	32
105	C R D	248	2 hf-ch	red leaf	110	34
106	Do	250	3 do	dust	195	35
107	G L, in estate mark	252	2 ch	pek sou	180	40
108	Moralioya	254	18 hf-ch	bro pek	990	51 bid
109	Do	256	20 do	pekoe	1000	46
110	Do	258	20 do	pek sou	900	42
111	Do	260	1 do	bro tea	40	39
112	Do	262	1 do	pk dust	86	35
113	Theberton	264	17 ch	pek sou	1700	39
114	Do	266	9 do	fans	900	36
115	Do	268	5 do	pek dust	500	32
116	Do	270	2 do	congou	200	30
117	Fetteresso	272	4 do	red leaf	380	30
118	Do	274	3 do	sou	285	40
119	Do	276	2 do	dust	290	35
122	Thornfield	282	30 do	bro pek	1800	64
123	Do	284	24 ch	pekoe	2400	51
124	Do	286	15 ch	pek sou	1470	45
125	Do	288	2 hf-ch	pek dust	160	36
126	Do	290	1 do	bro mix	56	33
127	Columbia	292	20 do	bro pek	1200	72 bid
128	Do	294	23 do	pekoe	1035	63
129	Do	296	2 do	pek sou	90	46
130	Do	298	1 do	dust	75	36
131	St. Catherine	300	10 ch	bro pek	900	54 bid
132	Do	302	6 do	pekoe	540	46
133	Do	304	5 do	pek sou	425	43
134	Do	306	1 do	fans	80	35
135	Chesterford	308	26 hf-ch	bro pek	1560	53 bid
136	Do	310	26 do	pekoe	1300	45
137	Do	312	18 do	pek sou	900	42
138	L B, in estate mark	314	1 ch	pekoe	92	36
139	Do	316	8 do	red leaf	288	27
140	Do	318	3 do	dust	300	34
141	Do	320	1 do	dust	162	33
142	St. Heliers	322	6 hf-ch	bro pek fans	420	37
143	Amblakan-da	324	5 ch	bro or pek	500	59
144	Do	326	9 do	pekoe	810	44
145	Do	328	6 do	sou	540	38
146	Avisawella	330	3 do	sou	315	36
147	Do	332	3 do	unas	135	44
148	Farnham	334	25 do	bro or pek	1250	60
149	Do	336	29 hf-ch	pekoe	1305	48
150	Do	338	46 do	pek sou	2070	46
151	Do	340	2 do	fans	120	36
152	Do	342	1 do	dust	65	35
153	A	344	3 do	bro tea	220	10
154	A	346	1 do	unas	60	36
155	A	348	1 do	red leaf	60	30
156	Annfield	350	3 ch	bro mix	300	37
157	Tellisagalla	352	12 do	bro pek	780	59
158	Do	354	3 do	bro pek fans	220	45
159	Do	356	19 do	pekoe	1120	47
160	Do	358	9 do	pek sou	520	45
161	Do	360	1 do	dust	100	35
162	M	362	1 bf-ch	bro pek	56	55
163	M	364	1 do	do	55	55
164	Horagas-kelle	366	5 do	bro pek	300	56
165	Do	368	5 do	pekoe	280	44
166	Do	370	9 do	pek sou	522	42
167	Do	372	1 do	bro mix	77	30

Mr. E. John put up for sale at the Chamber of Commerce Sale-room today, 11th March, the undermentioned lots of Tea (90,652 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	L	144	17 ch	fans	2380	37
2	L	146	13 do	congou	1235	42
3	Gonavy	148	42 do	bro pek	4200	59
4	Do	150	6 do	pekoe	540	49
5	Do	152	10 do	pek sou	900	46
6	Do	154	1 do	dust	150	45
7	F T	155	31 do	bro pek	3100	54
8	Do	157	15 do	pekoe	1500	47
9	Do	159	19 do	pek sou	1900	43
10	Do	161	2 do	bro tea	200	37
11	Tientsin	162	10 do	bro bek	1100	61
12	Do	164	30 do	pek sou	2700	48
13	Do	166	1 hf-ch	fans	65	36
14	Do	167	1 ch	dust	118	32
15	Mocha	168	25 hf-ch	bro pek	1375	66
16	Do	170	42 ch	pekoe	4200	56
17	Do	172	23 do	pek sou	2070	49
18	Ottery	174	23 do	bro pek	2300	66 bid
19	Do	176	37 do	pekoe	3330	55 bid
20	Do	178	18 do	pek sou	1620	48
21	Do	180	4 do	bro mix	520	36
22	H J R	181	13 do	bro pek	1235	54
[illegible]	Do	183	21 do	pekoe	1680	46
24	Do	185	14 do	pek sou	1190	43
25	Do	187	1 hf-ch	dust	80	32
32	P T E	199	1 do	dust	118	34
33	Do	200	1 do	fans	65	37
34	M R	201	1 do	dust	128	33
35	Do	202	1 do	fans	67	34
36	D E	203	5 do	fans	420	37
37	Do	204	5 do	bro mix	445	42
38	Agra Ouvah	205	34 hf-ch	bro pek	1700	53 bid
39	Do	207	31 do	bro pek	1550	49 bid
40	Do	209	22 do	or pek	1100	66 bid
41	Do	211	35 do	pekoe	1575	46 bid
42	Do	213	41 do	pekoe	1845	46
43	Do	215	26 do	pek sou	1170	43 bid
44	Do	217	40 do	pek sou	1800	43 bid
45	Do	219	7 do	pek sou No. 2	315	42
46	Do	220	7 do	pek fans	560	33
47	Brownlow	221	14 ch	bro pek	1540	66 bid
48	Do	223	14 do	pekoe	1330	56
49	Do	225	16 do	pek sou	1440	48
50	Do	227	1 do	dust	70	33
53	Albion	230	13 ch	bro pek	1320	66
54	Do	232	23 do	pekoe	2000	54
55	Do	234	23 do	pek sou	2300	47
56	Do	236	2 do	sou	210	40
57	Do	237	5 do	dust	750	37
58	B T	238	27 do	bro mix	2430	38
61	K B	244	3 do	bro mix	255	30
62	Do	245	7 do	bro mix	537	30
63	C K	246	2 do	pekoe	174	46
64	Doranakanda	247	2 hf-ch	pek fans	100	42
65	Do	248	2 do	dust	140	32
66	Do	249	13 do	bro mix	650	39
67	Do	251	2 do	bro tea	100	29
68	Glencorse	252	17 ch	bro pek	1785	55 bid
69	Do	254	19 do	pekoe	1710	47 bid
70	Do	256	27 do	pek sou	2295	43
71	Do	258	3 do	dust	435	32

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 11th March, the undermentioned lots of Tea (119,700 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. b	c.
1	P T W	386	1 hf-ch	fans	61	36
2	Do	388	1 ch	dust	110	33
3	Wallahan-duwa	390	9 hf-ch	bro pek	540	58
4	Do	392	15 do	pekoe	816	48
5	Do	394	16 do	pek sou	800	44
6	S P A	396	3 do	pek sou	150	41
7	Do	398	27 do	sou	1350	40
8	Do	400	3 do	bro tea	150	32
9	Do	402	2 do	dust	148	36
10	Do	404	5 do	bro mix	275	38
11	S P V	406	2 do	bro pek	120	55
12	Do	408	2 do	pekoe	114	46
13	Do	410	3 do	pek sou	150	43
14	Do	412	9 do	sou	437	39
15	S P B	414	2 do	unas	110	45
16	S K C, in estate mark	416	5 ch 3 hf-ch	bro pek	745	54
17	Do	418	15 do	pekoe	750	46
18	Do	420	1 do	bro tea	70	36
19	Halpan-tenne	422	3 ch	bro pek	300	56
20	Do	424	4 do	pekoe	390	46
21	Do	426	9 do	pek sou	795	41
22	Do	428	4 do	sou	320	39
23	Do	430	2 do	bulk	120	38
24	Do	432	2 do	pek fans	230	37
25	Do	434	2 hf-ch	fans	120	36
26	D O	436	3 ch	bro pek	300	50
27	Do	438	5 do	pekoe	500	42
28	Do	440	1 do 6 hf-ch	pek sou	400	41
29	Katugalla	442	5 ch	bro pek	550	50
30	Do	444	6 do	pekoe	600	46
31	Do	446	4 do	pek sou	400	44

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
32	Beverley	448	5	hf-ch	pek dust	375	35
33	Do	450	8	do	dust	600	31
34	Do	452	2	do	congou	110	30
35	H	454	3	ch	bro pek	285	53
36	H	456	1	do	pekoe	88	45
37	Becherton	458	16	hf-ch	bro pek	800	58
38	Do	460	34	do	pekoe	1530	46
39	Duckwari	462	2	ch	dust	280	32
40	Do	464	2	do	fans	270	37
41	Do	466	1	do	congou	110	38
42	Dehiowitta	468	15	hf-ch	bro pek	1575	58
43	Do	470	37	ch	pekoe	3700	47
44	Do	472	16	do	pek sou	1520	45
45	Do	474	1	do	bro tea	120	37
46	Do	476	1	do	dust	155	33
47	Yataderia	478	28	do	bro pek	3080	59
48	Do	480	37	do	pekoe	3700	47
49	Do	482	37	do	pek sou	3330	44
50	Do	484	14	do	bro tea	1260	39
51	Weyvelhena	486	5	do	bro or pek	525	56
52	Do	488	9	do	or pek	765	53
53	Do	490	22	do	pekoe	1760	47
54	Do	492	1	hf-ch	dust	80	32
55	Palamcotta	494	10	do	sou	550	43
56	Do	496	3	do	dust	255	33
57	Do	498	1	ch	red leaf	100	31
59	D E	502	5	hf-ch	bro pek	259	46
60	Do	504	10	do	pekoe	546	43
61	Do	506	4	ch	faus	578	37
62	W S	508	2	do			
			1	hf-ch	bro pek	250	54
63	Do	510	4	oh	pekoe No. 1	400	47
64	Do	512	2	do	pekoe No. 2	200	43
65	Do	514	1	hf-ch	dust	50	34
66	Atherfield	516	15	do	sou	750	42
67	Do	518	3	do	dust	240	30
68	Do	520	1	do	bro tea	50	33
69	S K	522	4	do	dust	292	34
70	Easdale	524	22	ch	bro pek	2200	58
71	Do	526	19	do	pekoe	1520	50
72	Do	528	27	do	pek sou	2160	44
73	Radella	530	39	do	bro pek	3900	59
74	Do	532	34	do	pekoe	2720	52
75	Do	534	41	do	pek sou	3280	44
76	California	536	1	hf-ch	bro pek	56	57
77	Do	538	1	do	pekoe No. 1	45	46
78	Do	540	1	do	pekoe No. 2	42	43
79	Do	542	1	do	pek sou	62	30
80	D, in estate mark	544	3	do	bro pek	194	56
81	Do	546	3	do	pekoe	168	45
82	A M B	548	9	do	pek sou	468	43
83	L, in estate mark	550	1	do	pek sou	34	39
84	Middleton, H	552	53	do	bro pek	3445	60
85	Do	554	20	ch	pekoe	2400	48
86	M	556	12	hf-ch	bro pek	780	56
87	M	558	4	oh	pekoe	440	47
88	M	560	2	do	pek sou	220	43
89	Galkadua	562	11	hf-ch	bro pek	550	56
90	Do	564	28	do	pekoe	1400	43
91	Do	566	30	do	pek sou	1500	42
92	Harangalla	568	32	ch	bro pek	3200	59
93	Do	570	57	do	pekoe	5130	45
94	Ferndale	572	8	do	bro pek	1800	63 bid
95	Do	574	30	do	pekoe	3000	47 bid
96	B E R	576	5	do	bro pek	450	51
96*a*	Do	577	4	do	bro pek	400	43
97	Do	578	10	do	pekoe	800	43
98	Do	580	16	do	pek sou	1440	41
99	Do	582	2	do	dust	230	33
100	B D	584	1	do	unas	79	45
101	Do	586	4	do	dust	660	32
102	Do	588	3	do	red leaf	320	28
103	Melrose	590	20	hf-ch	bro pek	1120	57
104	Do	592	12	ch	pekoe	1146	48
105	Do	594	8	do	pek sou	797	44
106	Do	596	2	hf-ch	dust	156	34
107	P	598	2	ch	fans	140	32
108	N, in estate mark	600	14	hf-ch	dust	1050	34
109	Do	2	2	oh	bro mix	250	42
110	Do	4	1	do	unas	105	42
111	Mary Land	6	9	do	bro or pek	900	53
112	Do	8	11	do	or pek	880	46
113	Do	10	13	do	pek sou	975	43
114	Do	12	1	do	dust	76	32
115	Midlothian	14	20	hf-ch	bro pek	1000	58
116	Do	16	23	oh	pekoe	2530	47
117	Do	18	2	hf-ch	congou	120	39
118	Do	20	2	do	red leaf	120	31
119	Do	22	1	do	dust	100	31

Lot No.	Mark	Box No.	Pkgs.		Description	Weight. lb.	c.
120	Ingeriya	24	2	ch	dust	155	35
121	Do	26	1	oh	pek sou	62	39
122	Bismark	28	1	do	dust	140	32
123	H S, in estate mark	30	6	do	dust	840	33
124	Amblakande	32	6	do	bro or pek	600	58
125	Do	34	10	do	pekoe	900	45
126	Do	36	7	do	sou	630	42
127	M K	38	2	do	or pek	120	71
128	Do	40	2	do	pekoe	200	45
129	Do	42	2	do	pek sou	200	44
130	Do	44	1	do	congou	100	38
131	Do	46	1	hf-ch	dust	47	31
132	Polatagama	48	35	do	bro pek	2100	62
133	Do	50	65	do	pekoe	3250	49
134	Do	52	75	do	pek sou	3750	45
135	Tonacombe	54	19	do	bro pek	1045	68
136	Do	56	45	do	pekoe	2250	51
137	Do	58	26	do	pek sou	1170	46
138	Do	60	13	do	sou	520	43
139	Do	62	3	do	dust	240	36
140	Do	64	4	do	pek fan	240	50
141	Hunugalla	66	5	ch	sou	450	40
142	V	68	5	do	pek sou	450	40
143	V	70	8	hf-ch	dust	560	33
144	V	72	8	do	bro mix	400	31
145	Radella	74	2	ch	red leaf	160	31

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room today, 11th March, the undermentioned lots of Tea (88,686 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	M A H, in estate mark	19	6	ch	congou	540	38
2	Do	20	2	do	red leaf	200	28
3	A E Ceylon, in estate mark	21	1	hf-ch	unas	50	35
4	Do	22	3	do			
			2	ch	dust	485	27
5	Do	23	6	do	bro tea	575	33
6	Yellebende	24	11	do	bro pek	990	60
7	Do	25	11	do	pek sou	935	46
8	I P	26	10	do	bro tea	900	35
9	C T M	27	2	ch	bro mix	180	33
10	Do	28	1	hf-ch	dust	70	30
11	D B G	29	3	do	fans	195	37
12	Do	30	7	do	bro mix	385	39
13	Do	31	3	do	dust	240	32
14	Mousa	32	13	do	bro pek	715	62
15	Do	33	15	do	pekoe	750	49
16	Do	34	22	do	pek sou	1100	47
17	Do	35	20	do	unas	1000	47
18	Do	36	2	do	sou	100	38
19	Do	37	2	do	red leaf	100	36
20	Ovoca, A I	38	15	do	bro pek	1725	71
21	Do	39	33	do	pekoe	3300	55 bid
22	Do	40	23	do	pek sou	2300	48 bid
23	Allakolla	41	12	hf-ch	bro pek	780	68
24	Do	42	27	ch	pekoe	2835	48
25	Do	43	18	do	pek sou	1800	44
26	Do	44	2	hf-ch	dust	150	32
27	Lyndhurst	45	11	ch	bro pek	1200	54 bid
28	Do	46	25	do	pekoe	2375	45
29	Do	47	24	do	pek sou	2205	42 bid
30	Mapitigama	48	10	do	bro pek	1095	58
31	Do	49	21	do	pekoc	1995	44 bid
32	Z, Star in estate mark	50	3	hf-ch	bro pek	150	44
33	Do	51	8	do	pekoe	400	41
34	Do	52	5	do	pek sou	210	40
35	M W S, in estate mark	53	1	do	bro pek	50	42
36	Do	54	6	do	pekoe	300	41
37	Do	55	3	do	pek sou	126	41
38	Ingeriya	56	3	do	or pek	165	59
39	Do	57	7	do	pekoe	350	48
40	Do	58	5	do	pek sou	245	44
41	Do	59	1	do	bro mix	65	35
42	Malgolla	60	20	do	bro pek	1100	49 bid
43	Do	61	23	do	pekoe	1150	46
44	Do	62	29	do	pek sou	1305	43
45	Arslena	63	22	do	unas	1100	47
46	Do	64	2	do	sou	100	38
47	Do	65	7	do	dust	350	33
48	Ederapolla	66	16	do	bro or pek	800	56 bid
49	Do	67	7	ch	or pek	630	48 bid
50	Do	68	19	do	pkeoe	1710	45 bid
51	Do	69	7	do	pek sou	630	43
52	Do	70	7	do	sou	630	42

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
53	C K W	71	13	ch			
			1	hf-ch	bro tea	1490	38
54	Do	72	2	do	congou	80	38
55	Do	73	1	do	pekoe	65	39
56	Malgolla	74	31	do	bro pek	1705	57
57	Do	75	48	do	pekoe	2400	47 bid
58	Do	76	55	do	pek sou	2475	43 bid
59	Do	77	10	do	bro tea	550	38
60	South Wanna Rajah	78	14	ch	bro pek	1400	77 bid
61	Do	79	34	do	pekoe	3400	50 bid
62	Do	80	12	do	pek sou	1200	46 bid
63	Abbotsford	81	28	do	bro pek	2940	67
64	Do	82	31	do	pekoe	3100	53
65	Do	83	16	do	pek sou	1600	47
66	Wereagalla	84	12	do	bro pek	1200	56 bid
67	Do	85	13	do	pekoe	1170	46 bid
68	Do	86	13	do	pek sou	1105	43 bid
69	J J	87	1	hf-ch	pekoe	60	37
70	N V	88	1	ch	pek sou	100	39
71	W T, in estate mark	89	22	hf-ch	pekoe	2420	43
72	C R D	90	16	ch			
			1	hf-ch	bro tea	1645	35 bid
73	Do	91	5	do			
			1	ch	dust	563	30
74	Patteragalla	92	4	hf-ch	bro pek	200	55
75	Do	93	6	do	pekoe	300	46
76	Do	94	10	do	pek sou	500	41
77	Pallai	95	15	do	pek fan	750	27 bid
78	M O	96	18	do	bro pek	990	49 bid
79	Do	97	20	do	pekoe	1000	45
80	Do	98	1	do	pek sou	39	38
81	F F	99	15	do	bro pek	825	50
92	P W E G, in estate mark	10	8	do	or pek	400	51 bid
93	Do	11	10	do	pekoe	460	44 bid
94	Do	12	9	do	pek sou	378	41 bid
95	Do	13	1	do	dust	70	31

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Feb. 20th.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 20th Feb. :—

Ex "Clan Macgregor"—Meddecombra, 1c 120s 6d; 5c 118s 6d; 3c 118s 6d; 6c 113s 6d; 1c 106s 6d; 1c 1b 142s; 1t 104s; 1b 108s.

Ex "Rome"—Cranley, 1c 116s; 3c 1b 115s 6d; 5c 1b 112s; 1t 105s 6d; 1c 1t 141s 6d; 1c 1b 103s 6d; 3b 109s.

Ex "Prometheus"—North Matale, 1 bag 89s.

Ex "Orestes"—Meeriabedde, 2c 1t 115s; 3c 1b 110s 6d; 1c 105s; 1t 140s; 1b 106s.

Ex "Navigator"—Hornsey, 1b 116s; 3c 115s; 5c 112s; 1c 105s; 1c 1b 141s; 1b 100s 6d; 1b 108s. Suduganga, 1t 110s; 2t 107s 6d; 1b 102s; 1b 126s. (SDGT) 1b 94s 6d. (SDCP), 1b 94s 6d.

Ex "Myrmidon"—WPF, 1c 107s; 2c 107s; 2c 105s; 1b 101s 6d; 1c 121s; 1c 96s 6d; 1b and 1b 94s 6d; 1b 1t 2b 104s.

Ex "Rome"—WP 1, 1c 1b 111s; 2c 1b 107s 6d; 1b 103s; 1t 103s; 1c 99s 6d.

Ex "Clan Macgregor"—Norwood, 1b 118s; 4c 117s 6d; 4c 1t 112s 6d; 1c 106s; 1c 1b 101s; 1t 101s; 1b 112s 6d.

Ex "Rome"—PDMOO, 1b 120s; 4c 1t 119s; 1c 1b 112s 6d; 1b 106s; 1t 140s; 1b 102s 6d. Wiharagalla, 1b 114s; 2c 111s 6d; 6c 107s 6d; 1c 103s 6d; 2t 130s; 3c 99s; 1b 105s. Rangbodde, 1c 1t 119s; 2c 1b 115s; 1b 103s 6d; 1b 138s; 1b 100s; 1b 107s. West Holyrood, 1b 118s; 1c 2t 116s; 2c 2t 112s 6d; 1b 105s 6d; 1c 141s; 1c 102s 6d; 1b 109s. Gonakelle, 1c 108s; 1t 99s 6d.

Ex "Austral"—Middleton, Dimbula, 1b 118s 6d; 2c 1b 116s; 1c 1b 112s 6d; 1b 104s 6d; 1t 140s; 1b 106s.

Ex "Glengarry"—Grange, 2c 1t 125s.

Ex "Austral"—Deyanella, 1b 115s; 2c 116s 6d; 1t 108s; 1b 103s 6d; 1b 129s; 1b 101s.

Ex "Myrmidon"—Elmshurst, 1b 1c 111s; 3c 1b 108s; 1t 102s 6d; 1b 102s; 1b 101s; 1t 1b 1b 106s; 3b 1b 94s 6d.

Ex "Orestes"—Bogawantalawa, 2b 3c 118s; 5c 113s; 2b 104s 6d; 4b 139s; 2b 102s 6d; 1b 113s.

Ex "Glengarry"—Pittarat Malle, 1b 114s; 1c 112s; 4c 103s 6d; 1c 1b 102s 6d; 1t 106s; 1c 101s; 2b 107s; 1b 95s.

Ex "Orestes"—Belgravia, 2c 114s 6d; 5c 1b 111s 6d; 1t 105s; 2t 134s 6d; 1t 101s; 1b 110s.

Ex "Austral"—Lunugalla, 1b 114s; 1c 2t 112s; 1c 1b 108s; 1b 106s 6d; 1t 136s; 1b 101s.

Ex "Myrmidon"—Ouvah, 1c 112s; 4c 1t 109s 6d; 1c 103s 6d; 1b 134s; 1c 136; 1b 101s 6d; 2b 107s.

Ex "Golconda"—Haputale, 2c 1b 116s; 3c 1b 109s 6d; 1t 104s 6d; 1t 139s; 2 bags 108s 6d; 4 102s. Leangawelle, 1c 1t 114s 6d; 5c 109s 6d; 1c 1t 105s; 1c 139s; 2 bags 108s 6d; 5 99s 6d.

CEYLON COCOA SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Feb. 20th, 1891.

Ex "Glengarry"—GW, 33 bags 106s 6d; 8 67s 6d. Sirigalle, 19 bags 105s; 2 71s; 1 61s; 1 50s. Dynevor, 2 bags 105s; 3 68s; 1 31s; 1 66s.

Ex "Myrmidon"—Gangaroowa, 20 bags 112s 6d; 27 112s 6d. Anniewatte, 26 bags 88s; 5 80s. AA, 22 bags 108s; 15 97s; 3 71s 6d; 5 68s; 1 54s. Kepitigalla; 30 bags 108s; 3 71s; 2 72s. Gonambil, 19 bags 104s; 25 80s 6d; 3 60s. Wariagalle, 78 bags 119s; 1 75s; 12 82s 6d; 14 47s; 3 40s; 3 52s; 1 40s; 101 119s. Hylton, 32 bags 108s; 13 100s; 3 69s 6d; 4 74s. Palli, 4 bags 68s; 1 65s; 6 74s; 1 50s.

Ex "Clan Macgregor"—Woodslee, 35 ags 104s; 2 73s; 11 73s; 1 32s.

Ex "Rome"—Wariagalla, 118 bags 119s 6d; 18 75s 6d; 12 48s. Hylton, 17 bags 114s; 8 100s; 2 67s 6d. Nartakande, 28 bags 108s; 3 65s; 3 64s. Sanquhar, 9 bags 105s; 1 65s.

Ex "Orestes"—Anniewatte, 20 bags 87s 6d; 11 87s; 7 90s 6d.

Ex "Kaisow"—Palli, 100 bags 109s 6d; 8 72s; 12 70s 6d.

Ex "Golconda"—Victoria, 32 bags 109s; 1 72s; 1 35s. Elmshurst, 7 bags 85s; 1 65s; 1 20s.

Ex "Navarino"—G(C)M, 12 bags 108s 6d; 3 96s; 1 65s.

Ex "Orestes"—Levelle, 14 bags 112s 6d. Kondesalle (OBEC), 1 bag 84s; 20 108s 6d; 42 109s; 6 81s 6d.

Ex Myrmidon"—Levelle, 20 bags 105s.

Ex "Orestes"—Mahaberia, 29 bags 120s; 12 109s; 4 60s.

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Feb. 20th, 1891.

Ex "Kaisow"—Gallantenne, 8 cases 3s 7d; 3 1s 9d; 4 1s 7d; 1 1s 6d. Yattawatte, 7 cases 2s 2d; 1 1s 7d; 2 1s 8d.

Ex "Orestes"—Gallawatte, 8 cases 2s; 2 2s 1d; 3 1s 3d; 1 1s 8d.

Ex "Legislator"—EGT, 3 cases 1s 2d. Meddecombra, 2 cases 1s 4d.

Ex "Myrmidon"—Wariagalla, 4 cases 2s; 4 1s 5d; 1 1s 3d; 7 1s 2d; 3 1s 9d; 1 1s 5d; 2 2s 3d. Mount Pleasant, Malabar, 4 cases 1s 8d.

Ex "Orion"—Katooloya, 2 cases 2s; 1 1s 6d; 2 1s 2d.

Ex "Chingwo"—Katooloya, 1 case 2s 1d; 1 1s 7d; 1 1s 3d.

Ex "Pallas"—Cottaganga, 2 cases 2s 3d; 2 1s 8d; 3 1s 4d; 2 1s 1d.

Ex "Prometheus"—Galaha, 20 cases 3s 8d; 3 2s 11d; 2 2s 10d; 1 1s 10d; 6 1s 5d.

Ex "Clan Ranald"—Kitoolmoola, 1 case 3s 9d; 3 3s 7d; 1 1s 10s; 1 1s 4d; 3 1s 6d.

Ex "Orestes"—Delpotonoya, 1 case 2s 11d; 1 2s 10d; 2 3s; 2 1s 6d; 1 1s; 1 1s 7d. (A&Co.,), 3 cases 1 5d; 3 6d. (JJA&Co.), 3 cases 1s 8d; 2 6½d.

Ex "Glengarry"—Elkadua, 1 case 2s 1d; 10 2s 2d; 3 1s 6d; 1 1s 3d; 2 1s 9d; 1 10½d. Nellaoola, 1 case 2s 1d; 14 2s; 2 1s 4d; 3 1s 9d.

Ex "Plassey"—K Group, 5 cases 1s 9d; 2 1s 8d; 2 1s 2d; 1 11½d.

Ex "Traveller"—Delpotonoya, 1 case 2s 9d; 1 2s 8d.

"CEYLON OBSERVER" PRESS, COLOMBO.

TEA, COFFEE, CINCHONA, COCOA, AND CARDAMOM SALES.

No. 9.] COLOMBO, APRIL 8, 1891. { PRICE :—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room, on the 11th March, the undermentioned lots of Tea (57,845 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
6	A K A C, in estate mark	9	35 hf-ch	pekoe	1750	47
7	Do	11	6 do	sou	300	43
8	Do	13	4 do	unas	200	46
9	A G C	14	10 do	dust	700	31
10	Nahalma	15	43 do	bro pek	2150	56 bid
11	Do	17	45 ch	pekoe	4500	47
12	Do	19	5 hf-ch	pek sou	250	44
13	Do	20	1 do	dust	75	34
14	Agar's Land	21	40 do	bro pek	2000	60 bid
15	Do	23	30 do	pekoe	1500	50 bid
16	Do	25	35 do	pek sou	1575	46
17	Do	27	34 do	sou No 2.	1530	40
18	Mohedin	29	2 do	bro pek	84	56
19	Do	30	3 do	pekoe	120	45
20	Do	31	7 do	pek sou	280	41
21	Do	32	2 do	congou	80	33
22	Do	33	2 do	red leaf	80	31
23	Do	34	1 do	bro pek fans	50	35
24	S C R	35	10 do	bro pek	508	60
25	Do	37	31 do	pekoe	1444	44 bid
26	Do	39	4 do	pek sou	240	39 bid
27	Do	40	1 do	fans	76	33
32	Agraoya	48	18 ch	bro pek	1800	70
33	Do	50	12 do	pekoe No. 1	1200	56
34	Do	52	15 do	do No. 2	1500	51
35	Do	54	1 do	dust	100	33
36	Comillah	55	1 box	bro or pek	10	1·00
37	Do	56	5 hf-ch	bro pek	275	50
38	Do	57	10 do	pekoe	500	44
39	Do	59	8 do	pek sou	400	43
40	Do	61	1 do	dust	68	31 bid
41	Y D, in estate mark	62	44 ch	or pek	4400	54 bid
42	Do	64	59 hf-ch	bro pek	3245	59 bid
43	Do	66	7 ch	pekoe	700	51
44	Kottagalla	67	1 ch	unas	90	50
45	Do	68	1 do	sou	69	39
46	Do	69	2 hf-ch	dust	170	31
47	Nahalma	70	38 do	bro pek	1900	55 bid
48	Do	72	43 ch	pekoe	4300	44 bid
49	Do	74	17 hf-ch	pek sou	850	43 bid
50	Do	76	1 do	dust	75	32
51	Woodend	77	11 ch	bro pek	1155	50 bid
52	Do	79	21 do	pekoe	2100	40 bid
53	Do	81	4 do	pek sou	400	41
54	Do	82	1 do	dust	135	31
55	W	83	7 do	bro pek	700	60
56	K P W	85	18 hf-ch	bro pek	900	54
57	Do	87	29 ch	pekoe	1305	49
58	Do	89	27 do	pek sou	1215	44
59	Do	91	7 do	sou	315	42
60	Do	93	1 hf-ch	dust	70	32
62	G H K, in estate mark	92	3 ch	sou	300	31
63	Do	94	3 do	bro sou	320	35
64	Do	95	1 hf-ch	pek dust	65	30
65	B, in estate mark	97	do	bro pek sou	136	38
66	K	98	2 do	sou	100	39
67	K	99	7 do	congou	350	37
68	K	103	8 do	dust	560	33

Messrs. E. BENHAM & Co. put up for sale at the Chamber of Commerce Sale-room on the 18th March, the undermentioned lots of Tea (1,027 lb.) which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	R	24	7 hf-ch	congou	350	34
2	R	26	5 do	dust	400	31
3	R	28	2 do			
			2 box	red leaf	172	28
4	H H	30	5 ch	pek sou	500	43
5	Do	32	3 do	bro mix	405	33

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room on the 18th March, the undermentioned lots of Tea (94,569 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Glanrhos	1	18 hf-ch	bro pek	900	57
2	Do	3	19 do	pekoe	1330	43
3	Do	5	23 do	pek sou	1610	42
4	Do	7	1 do	congou	85	30
5	Do	8	1 do	dust	90	33
6	Kelani	9	40 do			
			7 box	bro pek	2340	53 bid
7	Do	11	118 hf-ch	pekoe	5300	44 bid
8	Harrow	13	7 do	bro pek	420	51 bid
9	Do	15	12 do	pekoe	660	45 bid
10	Do	17	24 do	pek sou	1320	43
11	Do	19	2 do	bro mix	130	33
12	Ossington	20	18 do	bro pek	900	50
13	Do	22	14 do	pekoe	700	41
14	Do	24	18 do	pek sou	900	40
15	Do	26	1 do	dust	80	30
16	Do	27	2 do	fans	140	33
17	Do	28	2 do	red leaf	100	30
18	Brae	29	30 do	bro pek	1800	50 bid
19	Do	31	21 do	pekoe	1155	43 bid
20	Do	33	34 do	pek sou	1700	39 bid
21	Do	35	3 do	fans	180	32
22	Do	36	3 do	red leaf	150	29
23	Morton	37	9 ch	bro pek	900	48 bid
24	Do	39	17 do	pekoe	1360	44 bid
25	Do	41	21 do	pek sou	1680	39
26	Do	43	1 do	dust	125	32
27	L	44	1 do	bro mix	105	35
28	P, in estate mark	45	1 hf-ch	sou	80	34
29	Horagoda	46	5 ch	bro mix	500	50 bid
30	Do	48	18 do	pekoe	1710	41 bid
31	Do	50	1 do	pek sou	95	39
32	Shannon	51	60 hf-ch	bro pek	3300	60
33	Do	53	22 ch	pekoe	1980	46 bid
34	Do	55	21 do	pek sou	1890	43
35	Do	57	6 hf-ch	bro pek sou	288	32 bid
36	Do	59	2 do	dust	170	31
40	Agar's Land	66	40 do	bro pek	2000	60
41	D	67	2 ch	dust	280	32
42	Torrington	68	42 do	bro or pek	4620	64 bid
43	Do	70	57 ch	bro, pek	6270	55
44	Do	72	94 do	pekoe	9400	43 bid
45	Do	74	80 do	pek sou	8000	41 bid
46	Do	76	16 hf-ch	dust	1440	32
47	Bogahagodawatte	78	3 do	bro pek	210	50
48	Do	79	4 do	pekoe	200	41
49	Do	80	7 do	pek sou	350	39
50	Do	82	3 do	bro mix	208	33
51	Do	83	2 do	fans	110	33
52	Nahalma	84	45 do	bro pek	2250	55
53	Do	86	47 ch	pekoe	4700	44 bid
54	Do	88	6 do	pek sou	600	40
55	Do	90	1 hf-ch	dust	75	33
56	W W	91	3 do	pekoe	164	31 bid
57	Do	92	3 ch	pek sou	322	28 bid
58	Do	93	2 hf-ch	bro tea	112	26 bid
59	Do	94	5 ch	fans	750	29
60	Do	95	1 do	red leaf	95	25

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room on the 18th March, the undermentioned lots of Tea (67,949 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	B, in estate mark	10	3 hf-ch	congou	180	39
2	Do	11	1 do	dust	90	32
3	Beaumont, W	12	17 ch	bro pek	1700	54 bid
4	Do	14	27 do	pekoe	2484	43 bid
5	G K W	16	3 do	bro tea	270	28
	Do	17	2 do	dust	160	21
7	Dunbar	18	25 do	bro pek	2500	52 bid
8	Do	20	22 do	pekoe	1980	44 bid
9	Do	22	6 do	sou	540	39

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
10	Eila	24	14 ch	bro pek	1400	50 bid
11	Do	26	26 do	pekoe	2080	43 bid
12	Do	28	32 do	pek sou	2560	39 bid
13	Do	30	2 do	dust	250	33
14	Galkandawatte	31	46 do	bro pek	4600	55 bid
15	Do	33	62 do	pekoe	5580	44 bid
16	Ythanside	35	2 hf-ch	red leaf	160	27
17	Bittacy	63	21 hf-ch	bro pek	1260	55 bid
18	Do	38	35 ch	pekoe	2100	47 bid
19	N	40	4 hf-ch	bro mix	240	34
20	Ivies	41	12 ch	bro pek	1320	52 bid
21	Do	43	19 do	pekoe	1805	40
22	Do	45	12 do	pek sou	1080	40
23	Do	47	2 do	dust	160	21
24	Killaloo	48	35 do	sou	3150	37
25	Kandenewera	50	47 hf-ch	bro or pek	2350	53
26	Do	52	18 ch	pekoe	1440	43 bid
27	Do	54	47 do	pek sou	4230	41
28	D F, in estate mark	56	30 ch	bro pek	3150	47 bid
29	Do	58	24 do	pekoe	2280	43 bid
30	Do	60	31 do	pekoe No. 2	2915	41
31	Do	62	30 do	pek sou	2700	38 bid
32	Do	64	16 do	fans	1680	30
33	Do	66	1 do	dust	150	31
34	T	67	1 hf ch	dust	80	31
35	Keenagodde	68	10 do	bro pek	600	53
36	Do	70	6 ch	pekoe	660	43 bid
37	Do	72	5 do	pek sou	550	40
38	Do	73	1 hf-ch	dust	80	30
39	Comar	74	5 ch	bro tea	475	30
43	Gouravilla	78	9 do	pek sou	900	39
44	Do	80	24 do	sou	2400	39
45	Lawrence	82	30 do	sou	3000	35
46	B B	84	1 hf-ch	pekoe	45	35

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room on the 18th March, the undermentioned lots of Tea (74,396 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Heatherton	14	1 hf-ch	bro tea	45	28
2	Do	15	2 do	dust	176	31
3	Kuruwitte	16	6 do	bro pek	324	63
4	Do	17	4 do	pekoe	192	45
5	Do	18	16 do	pek sou	768	45
6	Do	19	5 do	sou	225	40
7	Do	20	3 do	bro tea	150	36
8	Do	21	1 do	congou	46	35
9	Do	22	1 do	dust	79	32
10	Depedene	23	14 do	bro pek	700	59
11	Do	24	31 do	pekoe	1550	48
12	Do	25	36 do	pek sou	1800	45
13	H D	26	102 do	bro tea	5100	37
14	Do	27	11 do	bro mix	550	29
15	Do	28	6 do	dust	480	31
16	Hatdowa	29	11 do	bro pek	550	51
17	Do	30	1 do	bro mix	50	30
18	Do	31	27 do	bro tea	1350	39
19	Do	32	1 do	congou	50	36
27	Ederapolla	40	11 hf-ch	bro or pek	550	53 bid
28	Do	41	4 ch	or pek	360	46 bid
29	Do	42	12 do	pekoe	1080	44 bid
30	Do	43	8 do	pek sou	720	44
31	Do	44	3 do	sou	270	37
32	Do	45	2 do	bro tea	200	34
33	Castle	46	2 hf-ch	bro pek	107	55
34	Do	47	7 do	pekoe	389	45
35	Do	48	3 do	pek sou	138	41
36	Eilandhu	50	15 do	bro pek	1200	49 bid
37	Do	51	22 ch	pekoe	1760	42 bid
38	Do	52	1 hf-ch	dust	70	30
39	St. Andrews	53	15 do	or pek	990	66 bid
40	Do	54	16 do	bro pek	1040	49 bid
41	Do	55	57 do	pekoe	3648	47 bid
42	Roseneath	56	21 do	bro pek	1470	49 bid
43	Do	57	13 ch	pekoe	1430	42 bid
44	Do	58	14 do	pek sou	1540	42
45	Kitulgalla	59	4 do	bro pek	400	50
46	Do	60	6 do	pekoe	480	43
47	Do	61	8 do	pek sou	640	42
48	Abbotsford	62	20 ch	bro pek	2000	60 bid
49	Do	63	23 do	pekoe	2300	49 bid
50	Do	64	12 do	pek sou	1200	45
51	No. 33	65	16 hf-ch	bro pek	720	52 bid
52	Do	66	27 do	pekoe	1080	39
53	Do	67	1 do	sou	30	30

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
59	Killin	73	6 ch	bro pek	600	47 bid
60	Do	74	6 do	pekoe	570	42 bid
61	Do	75	3 do	pek sou	270	42
62	Do	76	5 do	bro tea	500	33
63	E	77	1 do	pek sou	100	40
64	E	78	3 do	dust	360	30 bid
65	G L	79	4 do	congou	340	35
66	Do	80	2 do	bro tea	240	28 bid
67	E P	81	6 do	bro tea	420	30 bid
68	W	82	1 hf-ch	bro pek	46	out
69	A K T, in estate mark	83	11 do	pekoe	550	38
70	Do	84	5 do	pekoe	250	37 bid
71	Penrith	85	18 ch	bro pek	1890	56 bid
72	Do	86	27 do	pekoe	2540	43 bid
73	Do	87	23 do	pek sou	2005	43
74	Do	88	3 do	sou	300	36
75	Do	89	5 do	dust	750	31
76	F T E	90	4 hf-ch	bro pek	256	45
77	Do	91	4 do	pekoe	232	out
78	Do	92	15 do	sou	840	33
79	T, in estate mark	93	20 ch	pek sou	1960	37
80	S P B	94	2 hf-ch	unas	110	40 bid
81	M R M	95	18 do	bro or pek	990	46 bid
82	Blairavon	96	20 ch	bro pek	2000	53 bid
83	Do	97	21 do	pekoe	1890	45 bid
84	Do	98	35 do	pek sou	3150	43
85	Do	99	3 do	bro tea	340	28
86	Do	100	3 do	dust	360	30
87	Ellekande	1	6 hf-ch	bro pek	330	64 bid
88	Do	2	12 do	pekoe	600	48
89	Do	3	26 do	pek sou	1300	41
90	Do	4	8 do	bro mix	480	33 bid
91	Do	5	1 do	dust	480	30 bid
92	Charlie Hill	6	6 do	bro pek	240	50
93	Do	7	4 do	pekoe	160	43
94	Do	8	8 do	pek sou	320	42
95	Do	9	10 do	sou	370	36
96	Do	10	1 do	unas	50	32
97	Do	11	1 do	dust	48	32
98	S	12	2 ch	bro or pek	250	41 bid
99	G P W	13	8 hf.ch	bro pek	400	43
100	Do	14	10 do	pekoe	460	40 bid
101	Do	15	9 do	pek sou	378	40 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room on the 18th March, the undermentioned lots of Tea (148,189 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
3	G	80	1 do	dust	95	11
4	G	82	1 do	bro mix	70	27
5	D C S	84	3 hf-ch	bro pek	155	49
6	Do	86	2 ch	pekoe	180	44
7	Do	88	5 hf-ch	do No 2	246	43
8	Do	90	10 do	pek sou	450	40
9	Do	92	12 do	unas	480	36
10	Do	94	2 do	pek fans	105	32
11	Do	96	2 ch	sou	160	34
12	W K	98	2 hf-ch	bro pek	110	64
13	Do	100	6 do	pekoe	300	49
14	Do	102	3 do	sou	135	42
15	Do	104	1 do	fans	55	36
16	Do	106	1 do	red leaf	42	30
17	Farm	108	24 do	bro pek	1080	58
18	Do	110	12 ch	pekoe	1080	44
19	Do	112	17 do	pek sou	1360	42
20	Do	114	1 hf-ch	sou	40	31
21	Do	116	1 do	dust	70	33
22	Maskeliya	118	11 do	or pek	550	54
23	Do	120	3 ch	pek sou	300	44
24	Mousakelle	122	12 hf-ch	bro pek	720	57 bid
25	Do	124	19 do	bro pek	1045	57 bid
26	Do	126	39 do	pekoe	2340	48 bid
27	Do	128	40 do	pekoe	2000	48 bid
28	Do	130	2 do	congou	120	55
29	Do	132	2 do	dust	200	28
30	Deaculla	134	21 do	or pek	1260	66
31	Do	136	16 ch	pekoe	1600	48
32	Do	138	1 do	congou	100	36
33	Do	140	1 do	dust	70	30
34	Wavendon	142	1 do	dust	155	33
35	Palamcotta	144	2 hf-ch	dust	170	29
36	Do	146	1 ch	red leaf	100	29
37	Melrose	148	14 hf-ch	bro pek	840	58
38	Do	150	15 ch	pekoe	500	44
39	Do	152	9 do	pek sou	900	44

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
40	D, Melrose	154	7 hf-ch	bro pek	392	56
41	Do	156	4 ch	pekoe	400	45
42	Do	158	4 do	pek sou	400	44
43	Do	160	1 do	dust	80	33
44	Angroowella	162	2 hf-ch	dust	150	35
51	Chrystler's Farm	176	46 hf-ch	bro pek	2484	62bi d
52	Do	178	59 ch	pekoe	5015	51
53	Do	180	22 do	pek sou	1650	45
54	Do	182	3 do	sou	225	41
55	Do	184	2 do	dust	250	35
56	Do	186	1 do	bro mix	80	34
57	J R H	188	5 hf-ch	bro pek	275	52 bid
58	Do	190	6 do	pekoe	300	46
59	Do	192	6 do	pek sou	270	44
60	Tellisagalla	194	18 ch	bro pek	1080	59 bid
61	Do	196	33 hf-ch	pekoe	1650	43 bid
62	Do	198	10 ch	pek sou	500	43 bid
63	Do	200	2 do	bro mix	90	37 bid
64	Do	202	4 do	bro pk fans	260	41
65	Do	204	2 do	dust	180	33
66	Do	206	1 do	red leaf	55	29
67	Attabage	208	36 hf-ch	bro pek	1800	57 bid
68	Do	210	42 ch	pekoe	3780	45 bid
69	Debatgama	212	1 ch	congou	90	34
70	Do	214	1 do	fans	110	34
71	Do	216	1 do	dust	120	31
72	Iddegodde	218	2 ch	sou	100	36
73	Do	220	1 do	dust	128	31
74	K V	222	3 do	congou	270	36
75	Do	224	1 do	faus	100	34
76	G L, in estate mark	226	17 do	bro pek	1870	53 bid
77	Do	228	15 do	pekoe	1425	45
78	Do	230	3 do	pek sou	270	43
79	Tantiya	232	3 do	sou	222	37
80	Do	234	2 do	dust	242	31
81	Pingarawa, Uva	236	4 do	pek sou	360	38
82	Do	238	4 hf-ch	dust	320	33
83	H & H	240	3 ch	bro mix	300	32
84	Bowlana	242	7 do	bro pek	770	49 bid
85	Do	244	8 do	pekoe	800	46 bid
86	Do	246	8 do	pekoe sou	760	43
87	Court Lodge	248	26 hf ch	bro pek	1456	80
88	Do	250	23 do	pekoe	1058	65
89	Do	252	24 do	pek sou	1080	53
90	Do	254	1 ch	sou	86	46
91	Do	256	2 do	dust	272	34
92	Thornfield	258	37 hf-ch	bro pek	2220	61
93	Do	260	30 ch	pekoe	3000	49
94	Do	262	12 do	pek sou	1176	42
95	Do	264	3 hf-ch	pk dust	234	33
96	Kottiagalla	266	9 ch	bro pek	900	47
97	Do	268	14 do	pekoe	1400	39
98	Do	270	6 do	pek sou	600	34
99	Do	272	2 do	red leaf	188	25
100	Do	274	2 do	dust	286	31
101	Katugalla	276	4 do	bro pek	440	50
102	Do	278	5 do	pekoe	500	41
103	Do	280	3 do	pek sou	330	42
104	Freds Ruhe	282	22 hf-ch	bro pek	1100	60
105	Do	284	25 ch	pekoe	2500	45
106	Do	286	26 do 1 hf-ch	pek sou	2508	40
107	W A	288	7 ch 1 hf-ch	bro tea	885	37
108	Do	290	1 ch	dust	165	31
109	Do	292	1 hf-ch	red leaf	62	32
111	Do	296	2 do	pekoe No. 2	160	33
112	Do	298	2 do	bro sou	200	28
113	Yataderia	300	15 ch	bro pek	1650	51bid
114	G A	302	46 do	pekoe	4600	44
115	Do	304	19 do	pek sou	1710	43
116	Pansala-tenne	306	3 do	congou	300	37
117	Do	308	5 hf-ch	dust	375	33
118	Craighead	310	30 do	bro or pek	1500	51 bid
119	Do	312	19 ch	pekoe	1710	46 bid
120	Do	314	22 do	pek sou	1870	45
121	Do	316	5 do	sou	425	37
122	Palmerston	318	3 do	bro pek	200	58 bid
123	Do	320	6 do	pekoe	600	49
124	Do	322	4 do	pek sou	380	44
125	Avisawella	324	3 do	sou	315	36
126	Do	326	4 do	dust	600	32
127	Patiagama	328	2 do	dust	300	32
128	Kahagalla	330	13 do	pekoe	1300	41
129	Queensland	332	5 do	pek fans	375	36
130	Do	334	4 do	unas	400	44
131	T C O	336	2 do	sou	200	29
132	Blairgowrie	338	28 hf-ch	bro pek	1400	56 bid
133	Do	340	11 ch	pekoe	1045	44 bid
134	Do	342	9 do	pekoe	855	42
135	Do	344	2 hf-ch	bro mix	90	29
136	Do	346	1 do	dust	75	31
137	Monrovia	348	9 ch	bro pek	900	55
138	Do	350	13 do			
			1 hf-ch	pekoe	1355	43
139	Do	352	4 ch			
			2 hf-ch	pek sou	505	41
140	Do	354	1 ch	bro mix	102	32
141	Do	356	1 do	dust	138	29
142	B W	858	2 do			
			12 hf-ch	pekoe	775	41
143	R A	360	6 ch	bro mix	858	28
144	D A	362	2 do	bro pek	200	40
145	H A	364	6 do	pek fan	824	36
146	Ravaila	366	48 do	bro pek	4800	55 bid
147	Do	368	45 do	pekoe	4050	49 bid
148	Do	370	10 do	pek sou	950	45
149	Do	372	2 do	sou	160	38
150	Do	374	6 do	dust	480	28
151	Marguerita	376	12 hf-ch	bro pek	720	64 bid
152	Do	378	13 do	pekoe	650	59
153	Do	380	21 do	pek sou	1155	48 bid
154	A B C	382	31 do	bro pek	1860 }	out
155	Do	384	41 do	pekoe	2255 }	
156	Do	386	26 do	pek sou	1430	44 bid
157	Do	388	6 do	pekoe	300	45
158	Do	390	9 do	pek sou	450	45
159	Do	392	2 ch	dust	200	36
160	N	394	7 hf-ch	sou	350	36
161	N	396	2 do	dust	150	32
162	Glasgow	398	3 ch	bro mix	300	41
163	Do	400	4 hf-ch	dust	320	31
164	G T W	402	2 do	congou	100	33
165	Do	404	2 do	bro mix	100	29
166	Do	406	3 do	dust	258	32
167	Stisted	408	18 do	bro pek	1008	58 bid
168	Do	410	26 do	pekoe	1430	47
169	Do	412	4 do	pek sou	184	40
170	Do	414	2 do	dust	100	31
171	Attabage	416	14 do	bro pek	700	60 bid
172	Do	418	11 do	pekoe	990	44 bid
173	W G	420	3 do	bro pek fans	180	40 bid
174	Do	422	1 do	pek fans	70	34
175	B	424	23 ch	unas	2800	46
176	K C, in estate mark	426	4 hf-ch	bro pek sou	200	37
177	Do	428	13 do	pek fans	650	36
178	Do	430	3 do	dust	225	31
179	Panmure	432	13 ch	bro pek	1430	57
180	Do	434	19 do	pekoe	1995	46
181	Do	436	13 do	pek sou	1300	45
182	Do	438	1 do	dust	130	31
183	Do	440	1 do	bro mix	120	28
184	Panmure, Break No. 2	442	7 do	bro pek	770	57
185	Do	444	7 do	pekoe	735	46
186	Do	446	6 do	pek sou	600	45
187	Do	448	1 do	bro mix	125	28
188	S B R	450	1 do	dust	140	31
192	Dehigalla	458	1 do	bro pek	46	55
193	Do	460	1 do	pekoe	50	51
194	Do	462	1 do	congou	48	32

Mr. E. John put up for sale at the Chamber of Commerce Sale-room on the 25th March, the under-mentioned lots of Tea (58,008 lb.), which sold as under:—

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
1	B T	88	29 ch	bro mix	2610	38
2	Anchor, in estate mark	101	15 do	bro pek	1725	62
3	Do	103	29 do	pekoe	2900	49
4	Do	105	20 do	pek sou	2000	44
5	Meddo-gedera	107	40 hf-ch	bro pek	2320	54
6	Do	109	40 do	pekoe	2000	45
7	Do	111	19 do	pek sou	874	43
8	Do	113	1 do	sou	53	35
9	Do	114	5 do	dust	365	31
10	Eildon Hall	115	28 ch	bro pek	2800	57
11	Do	117	27 do	pekoe	2160	47 bid
12	Do	119	15 do	pek sou	1200	45
13	D F, in estate mark	121	30 do	bro pek	3150	50
14	Do	123	24 do	pekoe	2280	44 bid

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
15	Ottery	125	20	do	bro pek	2000	63 bid
16	Do	127	30	do	pekoe	2700	50 bid
17	Do	129	12	do	pek sou	1080	44 bid
18	Do	131	4	do	bro mix	520	33
19	Albion	132	22	do	bro pek	2420	64
20	Do	134	23	do	pekoe	2300	51
21	Do	136	13	do	pek sou	1300	45
22	Madool-tenne	138	12	do	bro pek	1320	52
23	Do	140	13	do	pekoe	1300	43
24	Do	142	12	do	pek sou	1200	38
25	Great Valley	144	25	ch	bro pek	2750	57
26	Do	146	30	do	pekoe	3000	46
27	Do	148	24	do	pek sou	2280	43
28	Do	150	1	do	red leaf	90	28
29	Do	151	3	hf-ch	pek dust	210	31
30	Agra Ouvah	152	33	do	bro pek	1485	59
31	Do	154	32	do	pekoe	1440	45 bid
32	Do	156	25	do	pek sou	1125	43 bid
33	Orange Field, P N R	158	3	ch			
			1	hf-ch	bro pek	346	50
34	Do	159	22	ch	pekoe	2090	43
35	Do	161	5	do			
			1	hf-ch	sou	495	36
36	Do	162	2	do	dust	120	36

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Feb. 27th.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 27th Feb.:—

Ex "Oanfa"—Delrey, 1c 118s; 3c 1b 116s; 4c 111s 6d; 1b 104s; 1o 1b 142s; 1b 100s; 2b 110s 6d.

Ex "Capella"—Agra, 1c 1t 1b 117s; 3o 1b 112s 6d; 1b 106s; 1b 140s; 1b 138s; 1t 102s 6d; 1b 110s.

Ex "Oanfa"—Gonagalla, 1b 116s; 4c 1b 115s 6d; 5c 110s; 1b 103s 6d; 1c 1t 141s 6d; 2b 110s 6d. Meddecombra, 1c 123s; 5c 120s; 5c 115s; 1c 107s 6d; 2c 143s; 1t 104s; 2b 116s 6d; 1b 99s.

Ex "Golconda"—Blackwood, 3c 1t 113s 6d; 5c 109s; 3c 109; 2c 105s; 1c 143s. Palmerston, 1c 115s 6d; 3c 1t 113s; 1t 107s 6d; 1t 140s.

Ex "Glengarry"—Nagalla, 1t 113s; 3c 109s 6d; 1t 105s 6d; 1b 92s 6d; 1b 124s. Balmoral, 1b 112s; 1c 107s; 1b 103s 6d; 1t 127s; 1t 116s 6d.

Ex "Austral"—Killarney, 5c 112s 6d; 2c 113s; 2o 1b 106s; 1t 103s; 1c 1t 135s 6d.

Ex "Goloonda"—Kahagalla, 1c 111s; 1c 1b 108s 6d; 1b 104s; 1b 129s.

Ex "Rome"—Kondesalle (OBEC), 2b 109s; 1c 106s 6d; 1b 102s 6d; 1b 126s. Naranghena, 2c 116s; 2c 1t 115s 6d; 2c 1t 110s 6d; 1b 103s 6d; 1c 140s. Darrawelle, 1t 115s 1c 111s; 1b 105s; 1b 134s. Mahaberiatenne, 1b 1o 104s 6d; 1b 103s; 1b 114s.

Ex "Oanfa"—New Cornwall, 1o 114s; 4c 1b 110s 6d; 1b 103s 6d; 2b 135s 6d; 1b 101s; 1b 106s.

Ex "City of Canterbury"—Caledonia, Dimbula, 1b 116s; 3c 116s 6d; 3o 1t 111s; 1t 105s 6d; 1o 1t 140s, 2t 103s 1b 109s.

Ex "Oanfa"—Elbedde, 1b 1o 118s; 5c 1t 115s; 5o 110s 6d; 1b 103s 6d; 2c 140s; 1o 100s 6d. Glasgow, 1t 1c 117s; 5c 114s 6d; 1c 1b 115s; 1b 104s 6d; 1b 1t 138s; 1c 1b 103s 6d; 1 bag 110s. RWA. 4c 113s 5c 1b 110s; 1b 101s; 2b 130s 6d; 1t 101s; 1 bag 107s.

Ex "City of Canterbury"—Dunsinane, 1c 118s; 4 116s 6d; 4 112s; 1b 103s 6d; 1c 140s. Tillicoultry, 1t 115s; 5c 1t 114s; 7c 110s 6d; 1b 104s 6d; 2o 140s.

Ex "Oanfa"—Pallai, 1t 109s; 1c 1b 106s 6d; 8c 1t 104s; 1c 102s 6d; 3c 1t 124s 6d. Ouvah 4c 115s; 10c 110s; 1 105s 6d; 1t 141s 1c 139s.

CEYLON CINCHONA SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, Feb. 27th, 1891.

Mark	Natural Stem	Renewed	Root
Brechin	1¼d to 1¾d	2¼d	...
Derry Clare	2d to 2½d	...	...
Fernlands	...	3d to 3½d	...
MCC Co. in diamond	...	4¾d to 5d	...
Haputale, mixed	2¾d to 3d	...	...
Dotel Oya, hybrid	2¼d	...	..
,, ,,	2¾d	3¾d	2d to 2½d
D C in diamond	2d	3d	2½d
Maturata, hybrid	2d	3d	2¼d
Hadley	2d	2¼d	2d to 2½d
Lindoola	2½d	3½d	...
Amanadowa, hyd.	3¼d to 4d	...	...
	OFFICINALIS.		
ST&LC. in diamond	...	6½d to 7½d	...
MCC Co. ,,	...	6d	...
Park	2½d	4½d	5½d
Maturata	2½d	4d to 5d	...

CEYLON COCOA SALES IN LONDON.

(*From Wilson, Smithett, & Co's. Circular.*)

MINCING LANE, Feb. 27th, 1891.

Ex "Golconda"—Crystal Hill, 44 bags 96s; 7 70s; 1 30s. Palli, 124 bags 115s; 16 73s; 3 78s.

Ex "Orestes"—Yattewatte, 86 bags 116s 6d; 3 71s 6d; 1 69. Lower Haloya, 8 bags 110s; 10 87s; 1 55s. Palli, 79 bags 116s 6d; 4 72s; 1 77s; 1 64s.

Ex "Malwa"—Gangwarily, 15 bags 100s; 3 73s 6d; 2 57s; 4 52s.

Ex "Myrmidon"—Wariagalla, 15 bags 107s 6d; 3 65s 6d.

Ex "Orestes"—Amba, 92 bags 117s 6d; 3 71s; 5 77s.

Ex "Glengarry"—Nellaoola, 1 bag 57s; 66s.

CEYLON CINNAMON SALES IN LONDON.

(*From Our Commercial Correspondent.*)

Monday, Feby. 23rd 1891.

G. D. C. Ekelle, 26 bales 6½d; 2 boxes 35 bags 6d; 3 bags 5½d.

R. Kadarane, 6 bags 8½d; 6 bags 8d; 18 bags 7½d; 18 bags 7d; 8 bags 7½d; 31 bales 6½d; 10 bales 6d; 3 bales 5¾; 1 par 5½d; 1 box 6d; 19 bags 5¾d.

Horahena, 2 bales 1 par 1s 2d.

G. & Co. (*in diamond.*) 6 bales 8d; 14 bales 8½; 1 parcel 6½d; 1 box (brok) 6d.

F. & Co., Ekelle, 4 bales 6d.

A. & Co., Ekelle 32 bales 9½d,

F—47, (*in diamond.*) 1 bag (broken) 6½d.

C. H. de S. 10 bales, 9d; 9 bales 8½d; 26 bales 7d; 7 bales 6½d; 4 bales 6d; 1 box 6d; 2 bags 6½d; 10 bags 6d; 37 bales 8d; 30 bales 7d; 6 bales 7½d: 12 bales 7d; 6 bales 7½d; 14 bales 7d; 17 bales 6½d; 4 bales 6d; 1 box 6½d; 3 bags 5½d; 18 bales 8½d; 17 bales 8d; 18 bales 7½d; 5 bales 7d, 2 bales 6½d; 1 box 13 bags 6d.

D. B. Ekelle, 5 bales 7½d 6 bales 7d; 5 bales 6½d; 7 bales 6d; 6 bales 6d; 27 bags qullings 6d.

A. de R. Ekelle, 18 bales 11½d; 2 bales 11d; 3 bales 9½d; 6 bales 7½d; 3 bales 6½d; 1 bale 7d; 1 box 6½d; 4 bags 6½d.

S. (*in diamond.*) Ekelle, 71 bales 8d; 18 bales 7½d; 11 bales 7d; 1 box 6½d.

H. F. P. Kaderana, 7 bales 8d.

C. P. H. & C. 15 bales chips 2d.

F. S K. Kaderane, 1 box 6½d.

A. S. G. P. Kaderana, 8 bales 6½d; 1 box 6½d; 12 bags clippings 6½d.

F. S. W. S. Kaderane, 4 bales 1s 1d; 5 bales 1s; 8 bales 11½d: 6 bales 10d; 2 bales 8½d; 1 box 6½d: 1 parcel 8d; 8 bales 7d; 9 bales 6½d; 1 bale 6d.

J. D. S. R. Kaderane, 1 bale 6½d: 3 bales 11d; 1 bale 9½d; 1 bale 8d; 2 bales 7d; 4 bales 6½d; 10 bags 6d.

No. 10.] COLOMBO, APRIL 11, 1891. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room on the 25th March, the undermentioned lots of Tea (44,005 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Kelani	1	40 hf-ch	bro pek	2200	57
4	W O	6	4 ch 1 hf-ch	fans	640	34
5	Do	8	4 do	bro tea	440	29
6	I B, in estate mark	9	52 do	bro or pek	5200	56
7	Do	11	120 ch	pekoe	10200	44 bid
8	Do	13	12 hf-ch	dust	840	32 bid
9	Norton	15	11 do	pekoe	550	46
10	A G C	17	19 do	dust	1330	33
11	Do	19	3 ch	sou	300	33
12	Nahalma	20	43 hf-ch	bro pek	2150	56
13	Do	22	36 ch	pekoe	3600	45
14	Do	24	6 do	pek sou	600	39
15	Do	26	2 hf-ch	dust	150	31
16	Yarrow	27	10 do	bro pek	640	60
17	Do	29	20 do	pekoe	1200	48
18	Do	31	5 do	pek sou	280	42
19	G H K, in estate mark	32	14 do	or pek	700	53 bid
20	Do	34	14 ch	pekoe	1330	43
21	W	36	3 hf-ch	pekoe	164	32
22	W	37	3 ch	pek sou	322	30
23	W	38	2 hf-ch	bro tea	112	28
24	K, in estate mark	39	4 ch	pek dust	540	31
25	Ruanwella	40	6 hf-ch	bro pek	300	48 bid
26	Do	41	11 do	pekoe	550	43
27	Do	43	5 do	pek sou	250	39
33	Hakuragalla	49	10 ch	bro pek	1000	52 bid
34	Do	51	12 do	pekoe	1080	44
35	Do	53	12 do	pek sou	1080	41
36	P O	55	3 hf-ch	bro pek	168	55
37	Do	56	13 do	pekoe	172	43
38	Do	58	14 do	pek sou	82	39
39	Do	60	1 ch	congou	53	29
40	Do	61	1 do	dust	67	30

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room on the 25th March the undermentioned lots of Tea (72,927 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	P G	16	5 ch	bro mix	550	38
2	X Z	17	16 hf-ch	pekoe sou	900	34
3	Naseby	18	11 do	bro pek	605	62 bid
4	Do	19	20 do	pekoe	1100	48 bid
5	Do	20	1 do	bro tea	75	32
6	Wewesse	21	16 do	bro pek	800	66
7	Do	22	17 do	pekoe	850	49
8	Do	23	21 do	pek sou	1050	43
9	Do	24	7 do	sou	350	40
10	Do	25	1 do	dust	80	29
11	E A T S, in estate mark	26	4 ch	bro pek	440	69
12	Do	27	3 do	pekoe	300	53
13	Do	28	3 do	pek sou	300	46
14	Do	29	1 hf-ch	dust	45	34
15	D G	30	5 do	bro pek fans	275	40
16	Do	31	6 do	fans	330	38
17	Do	32	5 do	dust	300	31
18	Do	33	5 do	bro mix	250	36
19	I N G, in estate mark	34	5 ch	bro pek	500	63
20	Do	35	10 do	pekoe	1000	50
21	Do	36	10 do	pek sou	1000	45
22	Do	37	3 do	fans	300	36
23	Do	38	1 do	bro mix	100	37
24	Do	39	1 do	dust	100	31
25	D B G	40	1 do	bro mix	110	33 bid
26	Do	41	3 hf-ch	dust	240	32
27	Do	42	1 ch	fans	110	35
28	C	43	1 do	bro tea	68	30
29	C	44	2 hf-ch	dust	130	30
30	E C	45	3 hf-ch	dust	210	32
31	Do	46	1 do	congou	45	33
32	C T M	47	3 ch	bro mix	270	31 bid
33	Do	48	1 hf-ch	dust	70	31
34	R X	49	1 ch	bro tea	120	35 bid
35	Do	50	1 do	bro mix	120	37
36	Do	51	2 do	pek dust	280	35
37	Yahalaenne	52	6 hf-ch	bro pek	360	48 bid
38	Do	53	13 ch	pekoe	1105	43 bid
39	Do	54	6 do	pek sou	540	40
41	Manickande	56	10 do	pekoe	525	37 bid
42	Do	57	13 ch	bro tea	1154	32 bid
43	S S	58	2 do	pekoe	196	37
44	Do	59	5 do	bro tea	559	30
45	A A	60	1 hf-ch	pekoe	56	33
46	Morningside	61	7 do	bro pek	350	52 bid
47	Do	62	23 do	pekoe	1150	45
48	Do	63	3 do	pek sou	168	37
49	Do	64	1 do	dust	60	30
50	Do	65	1 do	bro mix	56	29
51	St. Andrews	66	15 do	or pek	990	66 bid
52	Do	67	16 do	bro pek	1040	49 bid
53	Do	68	57 do	pekoe	3648	47 bid
54	Allakolla	69	12 do	bro pek	780	54
55	Do	70	18 ch	pekoe	1890	43 bid
56	Do	71	11 do	pek sou	1100	45
57	S B R	72	1 do	bro pek	90	44
58	Do	73	1 do	pek sou	90	36
59	Wereagalla	74	12 do	bro pek	1200	59
60	Do	75	12 do	pekoe	1080	47
61	Do	76	14 do	pek sou	1190	43 bid
62	Do	77	2 hf-ch	dust	150	31
63	Stinsford	78	24 do	bro pek	1320	53
64	Do	79	27 ch	pekoe	2700	44
65	Do	80	36 hf-ch	pek sou	1980	41
66	Do	81	3 ch	pek dust	420	30
67	Forest Hill	82	20 do	bro pek	2000	54
68	Do	83	20 do	pekoe	1900	46
69	Do	84	10 do	pek sou	900	43
70	Do	85	1 do	dust	130	32
71	Abbotsford	86	30 box	bro or pek	600	52 bid
72	Do	87	24 ch	bro pek	2400	57 bid
73	Do	88	21 do	pekoe	2100	46 bid
74	Do	89	12 do	pek sou	1200	43 bid
75	W. Star in estate mark	90	9 hf-ch	pek sou	378	40
76	Ovoca	91	14 ch	bro pek	1610	69
77	Do	92	23 do	pekoe	3300	51
78	Do	93	22 do	pek sou	2200	46
79	Crurie	94	15 do	bro pek	1650	59 bid
80	Do	95	19 do	pekoe	1805	48
81	Do	96	30 do	pek sou	2850	43 bid
82	Katherine Valley	97	9 hf-ch	bro pek	450	45
83	Do	98	6 do	pek sou	300	41
84	Do	99	2 do	congou	96	33
85	Kosgahena	100	5 ch	unas	500	35
86	Do	1	10 hf-ch	unas	500	36
87	B D P	2	1 do	bro pek	45	47
88	Do	3	2 do	pekoe	100	38
91	Pallai	6	19 do	pek fan	760	27 bid
92	Do	7	4 do	dust	280	28
93	P	8	5 ch	pek sou	525	37 bid
94	P W	9	9 hf-ch	bro pek	450	53
95	Do	10	13 do	pekoe	598	46
96	Do	11	10 do	pek sou	420	42
97	Do	12	1 do	dust	70	31
98	C C	13	7 do	bro tea	392	28
99		14	12 do	pek sou	720	43

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room on the 25th March, the undermentioned lots of Tea (135,155 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Ismalle	464	2 ch	dust	260	31
2	Do	466	1 do	bro mix	90	36
3	N M	468	3 do	red leaf	216	31
4	Alton	470	6 do	bro tea	640	43
5	N G	472	1 do	bro pek	100	47
6	Do	474	1 hf-ch	pekoe	50	44
7	Do	476	1 do	bro tea	60	32

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
8	Katugalla	478	5	ch	bro pek	650	51
9	Do	480	5	do	pekoe	500	41
10	Do	482	3	do	pek sou	330	43
11	D C	484	4	do	bro pek	400	49
12	Do	486	5	do	pekoe	500	43
13	Do	488	2	do	pek sou	200	41
14	Do	490	1	do	red leaf	100	29
15	Do	492	1	hf-ch	pek sou	50	41
16	Do	494	1	do	congou	50	31
17	Do	496	1	do	dust	60	31 bid
18	Portswood	498	24	do	bro pek	1440	86 bid
19	Do	500	46	do	pekoe	2530	66 bid
20	Do	502	17	do	pek sou	850	57
21	L G E	504	18	ch	or pek	1800	50
22	Do	506	13	do	pekoe No. 1	1300	44
23	Do	508	3	hf-ch	dust	255	31
24	Caledonia	510	8	ch	bro pek	800	53
25	Do	512	15	do	pekoe	1500	44
26	Do	514	1	do	bro pek sou	100	37
27	Clarendon	516	24	hf-ch	bro pek	1314	64
28	Do	518	40	ch	pekoe	4000	50
29	Glenorchy	520	21	hf-ch	bro pek	945	70
30	Do	522	12	do	pekoe	660	69
31	Do	524	22	do	pekoe	990	53
32	Do	526	16	do	pekoe	800	53
33	Do	528	4	do	pek sou	200	44
34	O O O O O	530	24	do	bro pek	1200	68 bid
35	Do	532	35	ch	pekoe	3325	45 bid
36	Shrubs Hill	534	29	do	bro pek	2900	
37	Do	536	31	do	pekoe	2325	
38	Do	538	30	do	pek sou	2550	withd'n
39	Do	540	2	do	sou	180	
40	Do	542	1	do	dust	170	
41	Dehiowita	544	18	do	bro pek	1890	55
42	Do	546	31	do	pekoe	3100	44
43	Do	548	11	do	pek sou	10450	41
44	Do	550	1	do	bro tea	120	35
45	Do	552	1	do	dust	160	31
46	L, in estate mark	554	1	hf-ch	pekoe	35	50
47	Do	556	1	do	pek sou	29	42
49	N M, in estate mark	560	1	ch	red leaf	110	39
50	C R D	562	5	hf-ch	dust	275	33
51	Do	564	3	do	red leaf	150	31
52	P D M	566	1	ch	congou	100	39
53	Do	568	1	do	dust	123	33
54	Chalmers	570	21	do	bro pek	1470	58
55	Do	572	30	do	pekoe	1800	48
56	Do	574	18	do	pek sou	1080	44
57	Do	576	6	do	pek fans	540	39
58	Do	578	2	do	dust	200	31
59	Do	580	3	do	bro mix	225	34
60	Donside	582	5	ch	bro pek	500	49 bid
61	Do	584	7	do	pekoe	595	out
62	Do	586	7	do	pek sou	595	out
63	Do	588	2	do	sou	170	36
64	Do	590	1	hf-ch	dust	70	31
65	D	592	11	do	pekoe	527	45
66	D	594	5	ch	bro mix	708	28
67	B T N	596	1	do	sou	90	36
68	Bramley	598	1	do	dust	110	31
69	Glengariffe	600	4	do	bro tea	420	41
70	Do	2	2	do	dust	200	31
71	Yataderia	4	19	do	bro pek	2090	55
72	Do	6	46	do	pekoe	4600	45
73	Do	8	33	do	pek sou	2970	43
74	Do	10	18	do	bro tea	1620	37
75	Alnoor	12	26	hf-ch	bro pek	1300	52
76	Do	14	19	do	pekoe	950	43
77	Do	16	1	do	dust	80	31
78	Galakadua	18	11	do	bro pek	550	53
79	Do	20	17	do	pekoe	850	43
80	Do	22	21	do	pek sou	1050	40
81	Do	24	3	do	red leaf	148	26
82	Middleton	26	52	do	bro pek	3380	60
83	Do	28	19	ch	pekoe	2090	48
84	Do	30	1	do	congou	112	36
85	Do	32	3	hf-ch	dust	240	31
86	Yahalakelle	34	2	ch	pek dust	160	31
87	Talgaswella	36	44	do	bro pek	4440	53
88	Do	38	6	do	pek sou	600	43
89	Yalta	40	16	hf-ch	pek sou	800	49 bid
90	Do	42	8	do	sou	400	49
91	Do	44	7	do	dust	560	33 bid
92	Polatagama	46	37	do	bro pek	2220	61
93	Do	48	86	do	pekoe	4300	47
94	Do	50	85	do	pek sou	4250	44
95	Abamalla	52	8	do	bro mix	600	37
96	Do	54	9	do	dust	675	31
97	Chesterford	56	25	do	bro pek	1500	52
98	Do	58	31	do	pekoe	1550	43
99	Do	60	20	do	pek sou	1000	38

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
100	Alnoor	62	27	hf-ch	bro pek	1400	52
101	Do	64	21	do	pekoe	1050	46
102	Do	66	12	do	pek sou	600	46
103	Do	68	2	do	dust	160	31
104	M O G	70	23	do	bro pek	1380	58
105	Do	72	25	do	pekoe	1500	48
106	Do	74	11	do	pek sou	660	43
107	M A E	76	10	ch	pekoe	1000	43
108	Do	78	4	do	pek fan	600	36
109	St. Heliers	80	5	hf-ch	pek fan	350	36
110	Bismark	82	2	ch	dust	280	32
111	Amblakanda	84	18	do	bro or pek	1800	58
112	Do	86	39	do	pekoe	3510	44
113	Do	88	17	do	sou	1530	40
114	Do	90	4	do	bro mix	480	30
115	Tbeydon Bois	92	15	do	bro or pek	1500	56
116	Do	94	19	do	pekoe	1710	44
117	Do	96	6	do	sou	510	40
125	Liskilleen	112	24	do	bro pek	1200	54
126	Do	114	24	ch	pekoe	2400	44
127	Do	116	3	hf-ch	congou	150	37
128	Do	118	3	do	dust	210	31
129	Farnham	120	18	do	bro or pek	900	59
130	Do	122	23	do	pekoe	1035	47
131	Do	124	38	do	pek sou	1710	44
132	Do	126	4	do	unas	180	43
133	Do	128	3	do	fans	180	33
134	Do	130	2	do	dust	130	31
135	A B C	132	31	do	bro pek	1860	57 bid
136	Do	134	41	do	pekoe	2255	46
137	Do	136	26	do	pek sou	1430	45
138	M M	138	4	do	bro pek	256	48
139	Do	140	4	do	pekoe	232	42

Messrs. Somerville & Co put up for sale at the Chamber of Commerce Sale-room on the 8th April, the undermentioned lots of Tea (85,338 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Wevelmadde	15	3	ch	dust	273	31
2	Do	16	1	ch	red leaf	91	28
3	P	17	10	do	pek sou	1000	41
4	P	18	3	do	bro mix	330	31
5	P	19	2	do	dust	320	34
6	Marymont	20	6	hf-ch	unas	300	37
7	Hattanwella	21	46	do	pekoe	2300	42 bid
8	A B B	22	2	ch	pekoe	200	39
9	Do	23	1	hf-ch	dust	65	31
10	Lyndhurst	24	11	ch	bro pek	1210	53
11	Do	25	23	do	pekoe	2185	44
12	Do	26	22	do	pek sou	2090	39 bid
13	Depedene	27	15	hf-ch	bro pek	755	57
14	Do	28	31	do	pekoe	1550	48 bid
15	Do	29	41	do	pek sou	2050	42
16	H D	30	8	do	bro mix	400	30
17	Do	31	71	do	bro tea	3550	39
18	Do	32	4	ch	dust	400	31
19	Hiralouvah	33	18	do	bro pek	2016	50
20	Do	34	20	do	pekoe	1900	44
21	Do	35	8	do	pek sou	811	40
22	Do	36	1	do	fans	95	36
23	Do	37	2	do	bro mix	232	32
24	Do	38	4	hf-ch	dust	270	29
25	Stockholm	39	23	do	or pek	1265	60 bid
26	Do	40	22	ch	pek sou	2090	46 bid
27	Do	41	2	do	fans	280	35
28	Vincit	42	7	hf-ch	bro pek	385	53 bid
29	Do	43	13	do	or pek	650	44 bid
30	Do	44	13	do	pekoe	715	42 bid
31	Do	45	5	do	pek sou	275	37 bid
32	Do	46	2	do	bro tea	120	31 bid
33	Do	47	4	do	pek dust	260	33
34	Do	48	1	ch	fans	100	25 bid
35	W V	49	3	do			
			1	hf-ch	unas	350	42
36	Do	50	1	do	dust	50	31
37	T, in estate mark	51	5	do	pek fans	280	36
38	Do	52	4	do	mixed	228	37
39	Do	53	4	do	dust	328	30
40	Pallai	54	57	do	pek fans	2280	26 bid
41	Deemally	55	8	do	or pek		
42	Do	56	27	ch		475	60 bid

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
72	St. Andrews	86	30 hf-ch	bro pek	1950	48 bid
73	Do	87	57 do	pekoe	3648	withd'n
74	Do	88	34 do	do	2176	"
75	E L K	89	10 do	pekoe	525	38
76	W L K	90	2 ch	pekoe	194	31
77	Do	91	1 hf-ch	dust	72	29
78	Abbotsford	92	30 box	bro or pek	600	53 bid
79	Do	93	24 ch	bro pek	2400	55 bid
81	Do	95	12 do	pek sou	1200	44
86	E D P	100	1 hf-ch	bro or pek	50	41
87	M A H	1	4 ch	congou	360	30 bid
88	Do	2	1 do	dust	130	30
89	Do	3	2 do	red leaf	200	26 bid
90	Narangoda	4	3 ch	or pek	300	50
91	Do	5	7 do	pekoe	700	46
92	Do	6	13 do			
			1 hf-ch	pek sou	1350	44
93	Do	7	1 ch	sou	87	33
94	Do	8	2 hf-ch	dust	140	31
95	Hatdowa	9	5 ch	bro pek	500	46
96	Do	10	13 do	bro tea	1300	37
97	Do	11	1 do	congou	100	32
98	Do	12	1 do	red leaf	100	30
			1 hf-ch	unas	2620	42 bid
43	Do	57	1 ch	sou	70	36
44	M C A	58	13 do	pek scu	1154	33
45	Do	59	5 do	bro tea	559	27
46	Roseneath	60	23 hf-ch	bro pek	1610	52 bid
47	Do	61	14 ch	pekoc	1540	45 bid
48	Do	62	16 do	pek sou	1760	42
49	S	63	1 do	bro pek	110	52 bid
50	Wewesse	64	18 hf-ch	bro pek	900	59
51	Do	65	24 do	pekoe	1200	50
52	Do	66	23 do	pek sou	1150	44
53	Do	67	1 do	sou	50	34
54	Do	68	2 do	dust	160	30
55	S, in estate mark	69	5 ch	pek sou	525	36
56	E	70	8 do	dust	1229	28
57	E	71	2 do			
			2 hf-ch	red leaf	290	27
58	W	72	5 ch			
			5 hf-ch	bro mix	825	27
59	Pallai	73	25 do	pek fans No. 1	1125	27 bid
60	Do	74	28 do	do ,, 2	1120	23 bid
61	Do	75	15 do	pekoe	600	30 bid
62	Do	76	5 do	dust	350	25 bid
63	T T	77	16 do	pek sou	900	33 bid
68	S	82	7 ch	dust	490	29 bid
69	S	83	2 do	dust	280	23 bid
70	B T	84	12 hf-ch	bro tea	1255	32
71	Do	85	2 do			
			1 ch	pekoe	225	34

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, March 6th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 6th March :—

Ex "City of Canterbury"—Wiharagalla, 1t 115s; 5c 113s 6d; 3c 109s; 1c 1b 104s 6d; 2c 136s; 4c 101s 6d; 1b 2c 103s; 1c 98s; 1b 109s; 1t 1b 92s 6d; 3b 109s; 1b 100s.

Ex "Austral"—Batgodde, 1c 1t 113s 6d; 1t 103s 6d; 1b 130s; 1b 109s 6d.

Ex "City of Canterbury"—Talawkellie, 1c 1t 114s 6d; 2c 111s; 1b 106s; 1t 138s; 1b 101s 6d. Galloola, 1t 114s; 2t 109s 6d; 2b 106s 6d; 1b 129s; 1b 99s 6d; 1b 99s 6d. Badullawatte, 2c 1b 117s; 4c 1t 112s 6d; 1t 106s; 1t 140s; 1t 136s 6d; 1c 107s; 1b 107s.

Ex "Canfa"—Invery, 1c 1t 114s 6d; 2c 110s; 1t 105s; 1t 136s; 1b 100s.

Ex "Chusan"—Norwood, 1b 121s; 5c 1b 171s 6d; 6c 114s; 1c 1t 106s 6d; 2c 141s; 1t 100s 6d; 1b 108 6d. Mausagalla, 1b 116s 6d; 2c 114s; 2c 1b 111s; 1c 106s 6d; 1c 142s.

Ex "Oruba"—Cabragalla, 1c 1b 117s; 1b 108s; 1b 136s

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 13th March :—

Ex "India"—Belgravia, 1c 116s; 4c 112s 6d; 1t 107s.

Ex "Polyphemus"—Ury, 3c 1b 115s; 4c 1b 100s; 1c 106s; 1c 140s; 1c 1t 112s. Mt. Vernon AOW, 1c 1t 10 s 1t 104s; 1c 135s.

Ex "Chusan"—Sutton, 3c 118s 6d; 5c 113s 6d; 3c 114s; 1c 108s; 2c 141s; 1c 104s; 1b 115s.

Ex "Legislator"—Hantane, 1t 101s; 1c 1t 109s; 2c 106s 6d; 1b 104s; 1b 119s; 1c 99s; 1b 107s. St. Clair, 1c 117s; 3c 1t 117s 6d; 5c 114s 6d; 1c 1t 114s 6d; 1c 107s; 1c 1t 141s 6d; 1c 104s; 1t 102s; 1b 107s; 1b 117s.

Ex "Oruba"—Kotiyagalla KTGT, 1b 102s; 4c 111s; 2c 2t 108s 6d; 1t 1b 105s 6d; 1c 1t 131s; 1c 1c 102s 6d: 1b 96s.

Ex "India"—Blackwood, 1c 110s; 3c 1b 109s; 1c 1b 106s; 1b 127s 6d. Haldamulle, 2c 1b 115s 6d; 3c 1b 111s; 1c 1t 107s; 1c 140s. Hanipha, 1c 1b 113s; 1c 1t 109s; 1b 105s; 1b 127s 6d; 4b 4b 100s.

Ex "Sobraon"—Gonamotava, 1c 112s; 6c 111s; 2c 106s; 1c 136s; 1c 1b 103s; 1c 110s 6d; 5c 1b 109s; 2c 106s; 1c 130s; 1c 1b 102s; 2b 108s 6d; 2b 107s 6d.

Ex "India"—Ravenswood, 1t 112s; 2c 1t 108s 6d; 1b 103s 6d; 1b 120s. Haputale, 1c 113s 6d; 3c 1t 110s 6d; 2c 106s 6d; 1c 136s; 2b 103s 6d; 5b 102s. Mahadowa, 2c 1b 114s 6d; 3c 1b 110s 6d; 1t 106s; 1t 137s; 2b 109s 6d; 4b 107s 6d.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 20th March :—

Ex "Legislator"—Tillicoultry, 1t 119s; 3c 117s; 6c 1t 113s 6d; 1b 115s; 1c 106s 6d; 2c 138s 6d; 1t 106s 6d; 1b 105s; 1c 1b 125s 6d; 2c 104s.

Ex "Oruba"—Balmoral, 1b 114s; 3c 116s; 2c 110s 6d; 1t 105s 6d; 1c 1t 133s 6d; 1c 103s 6d.

Ex "Legislator"—Gouravilla, 1b 118s; 2c 1t 120s; 4c 115s; 1b 106s; 2t 142s; 1c 104s; 1b 111s. Gowerakellie, 2c 118s 6d; 3c 1t 111s; 1t 104s; 1t 140s; 1c 102s 6d; 1t 1b 101s; 1b 113s; 1b 118s. Niabedda, 1t 117s. 5c 110s; 3c 1t 110s; 3c 106s; 2t 140s; 2c 102s 6d; 2b 109s; 1b 104s. Wiharagalla, 3c 1t 105s; 1t 104s; 1b 108s; 1c 1t 109s; 1b 2t 1b 102s 6d; 1b 104s; 1b 4c 99s 6d; 1b 101s 6d; 1ct 1t 94s; 1b 105s; 1b 99s.

Ex "Laertes"—Holbrook, 1b 117s; 1c 1b 116s; 3c 110s 6d; 1b 105s; 1c 141s; 1t 102s 6d.

Ex "Pakling"—Wevekelle, 1t 115s; 3c 112s 6d, 3c 1b 109s; 1c 104s 6d; 1c 140s; 1c 102s 6d.

Ex "Laertes"—BBWD, 1c 116s; 4c 1b 113s 6d; 4c 1b 108s 6d; 1b 104s 6d; 1c 140s; 1t 102s; 2b 108s. Bridwell, 1b 3c 115s; 3c 111s; 1b 105s; 1b 141s; 1t 103s 2b 108s 6d, 1c 1b 118s 6d; 5c 1b 117s; 4c 1b 112s; 1b 104s; 1c 1b 140s 6d. Coslanda, 1c 103s 6d; 2b 109s; 1t 113s; 3c 1b 110s 6d; 5c 1b 107s 6d; 1c 104s; 1c 136s; 1c; 1b 102s; 1b 105s. Yoxford, 2c 119s 6d; 8c 117s 6d; 7c 1b 111s; 1b 104s; 2c 140s 6d; 1t 103s; 6b 108s; 1b 99s. Coslanda, 1b 99s.

Ex "Pakling"—Bridwell, 1b 115s; 3c 1b 116s 6d; 1b 113s; 6c 112s 6d; 1b 119s; 1t 106s; 1c 1t 140s; 1c 1b 103s. Thotulagala, 1b 110s; 1c 1b 108s 6d; 6c 1t 10 s; 1c 103s 6d; 1c 136s; 1c 101s 6d; 1b 105s 6d; 2b 106s 6d. Ampitiyakanda, 1b 114s; 1c 109s; 1c 1b 106s; 1b 104s; 1b 126s; 1t 102s 6d. Meddecombra, 1c 121s; 7c 1b 118s 6d; 6c 164s 6d; 1c 1b 108s; 2c 142s 6d; 1c 104s; 1b 114s; 1b 116s.

Ex "Manora"—Meddecombra, 1b 119s; 1c 115s; 6c 111s; 1c 1b 106s; 2c 1b 140s; 1c 103s; 1b 110s.

Ex "Pakling"—Fordyce, 1b 116s; 2c 114s 6d; 3c 110s; 1b 105s; 1c 141s; 1b 103s; 1b 110.

Ex "Laertes—Kew, 1b 117s; 1c 1b 111s; 2c 116s; 1b 106s; 1t 142s; 1b 100s 6d.

Ex "Manora"—Morar, 1b 116s; 2c 1t 113s 6d; 4c 1b 110s 6d; 1b 106s; 1c 1t 141s 6d; 2t 103s 1b 106s.

Ex "Pakling"—Upper Cranley, 1b 118s; 1c 115s; 6d; 3c 111s 6d; 1b 104s 6d; 1t 138s 6d; 1b 102s; 1b 109s; 1b 117s; 1c 115s; 3c 111s; 1b 105s; 1t 138s; 1b 102s 6d 1b 109s.

Ex "Clan Mackenzie"—Lawrence, 3c 1t 117s 6d; 5c 112s; 1b 105s; 1c 138s; 1t 102s 6d; 1b 88s; 1b 110s.

Ex "Manora"—Yapame, 1c 1t 116s 6d; 2c 111s; 1b 125s; 1b 125s; 1b 102s 6d.

Ex "Navarino"—Wewesse. 2c 109s 6d; 2c 107s; 1b 102s 6d; 1t 120s; 1b 97s; 1b 105s.

Ex "Sobroan"—Maha Uva, 1c 1b 110s; 1c 1t 107s; 2c 1b 105s; 1t 102s; 1c 116s; 1b 98.

Ex "Mira"—Glasgow, 1b 115s; 1b 5c 112s; 1c 1b 107s; 1b 134s; 1b 1c 138s 6d; 1c 1b 103s 6d; 1b 110s.

Ex "India"—Braemore, 1c 115s; 1t 106s; 1b 1t 138s; 1b 102s 6d; 1b 111s.

Ex "Navarino"—Bogawantalawa, 1t 106s; 1b 141s; 1b 1c 138s 6d; 1c 103s 6d; 1b 112s. Ambawella, 1t 105s 6d; 1t 133s; 1c 102s 6d; 1b 108s. Bogawantalawa, 1c 106s; 1b 131s; 1c 128s; 1c 103s; 1b 108s. Louisa, 1b 120s; 3c 118s; 1b 106s; 1c 138s; 1t 103s.

Ex "Pakling"—Roehampton, 1b 113s 6d; 1c 110s 6d; 6c 1b 107s 6d; 1c 1t 105s; 1s 138s; 1t 102s 6d; 2b 107s. Gracelyn, 1b 105s; 1b 104s; 1b 113s; 1b 99s.

Ex "Cuzco"—Beredewelle, 1t 105s; 1b 101s; 1b 97s; 1b 104s; 1b 87s Rathnillckelle, 1c 108s; 1t 105s 6d; 1b 104s; 1b 120s; 1b 100s.

Ex "Manora"—Aldie, 1b 138s; 1b 103s.

Ex "Pakling"—Kabagalla, 1c 112s 6d; 5c 109s; 3c 1t 106s 6d; 1c 138s; 1c 1t 115s; 3c 1b 111s; 1c 106s; 1t 140s; 4b 101s. Ouvah, 2c 1t 113s; 5c 110s; 1c 1b 110s; 1c 105s 6d; 1b 136s; 1c 135s; 1c 102s 6d; 3b 107s 6d.

Ex "Cuzco"—Macoolussa, 1b 110s; 2c 107; 1b 105s; 1b 117s; 1b 93s; 1b 102s; 1b 108; 1b 93s.

Ex "India"—Belgravia, 1b 128s; 1c 128;

Ex "Manora"—Fermoyle, 1c 1 14s; 1c 1 10s 6d; 2b 106s. Needwood, 1c 109s; 1t 106s; 1b 134s. Deagalla, 1c 113s 6d; 2c 110s; 1c 105s; 1b 134s; 1b 101s.

Ex "Pakling"—(B W), 1b 1c 104s; 1c 103s 6d; 1c 120s.

CEYLON CINCHONA SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, March 13th, 1891.

Mark.	Natural Stem.	Renewed.	Root.
Verelapatna	1¾d	2½d	...
Dromcland	2½d	...	...
Meddecombra	2d to 2½d	...	...
Mausagalla	2½d to 5½d	4½d to 5d	...
Dessford	2d to 3½d	...	2d to 2½d
Roeberry	2¾d to 3d	...	...
Kandal Oya	3½d to 4d	...	...
Uvakelle	2¾d	3½d	...
M C C Co. in dia.	2½d	...	...
Meeriabedde	2¼d to 2½d	...	...
Condegalla	2d	...	2¼d to 2½d
OFFICINALIS.			
Verelapatana	1¾d	2½d	...
Mausagalla	3d to 3½d	...	...
Amandowa	2d to 2½d	...	...
M C C Co. in dia.	...	5¼d to 5½d	...
" Calisaya	5½d	...	...
C H de S	2½d to 3½d	...	...

CEYLON COCOA SALES IN LONDON.

(From Wilson, Smithett, & Co's. Circular.)

MINCING LANE, March 6th, 1891.

Ex "City of Canterbury"—Delgolla, 39 bags 120s 6d; 100 bags 116s 6d; 16 71s; 5 83s 6d.

Ex "Oanfa"—Palli, 20 bags 120s 6d; 6 75s; 2 82s 6d; 84 120s 6d.

Ex "Austral"—Beredewelle, COC, 1 bag 46s; 1 53s 38 120s 6d; 2 80s 6d.

Ex "Austral"—Lesmoir, 8 bags 105s; 1 59s; 1 36s.

Ex "City of Canterbury"—Sudugauga, 123 bags 118s 6d; 5 69s. Maousava, 19 bags 120s 6d; 3 53s; 2 70s; 7 110s 6d. Kandewatte, 20 bags 111s 6d; 1 42s; 1 54s. Warriapolla, 1 bag 101s.

Ex "Austral"—Dynevor, 42 bags 118s; 8 74s 6d; 2 51s.

Ex "Myrmidon"—Eriagastenne SD, 45 bags 117s; 3 73s; 2 68s; 6 56s 6d.

Ex "City of Canterbury"—Kepitigalla, 27 bags 118s 6d; 3 73s.

Ex "Rome"—Nartakauda, 1 bag 100s.

MINCING LANE, March 13th, 1891.

Ex "Chusan"—Mahaberia (OBEC), 45 bags 123s 6d; 18b 115s; 41b 50s. Kondesalle, 18b 123s 6d; 28b 115s 6d; 11b 85.

Ex "Rome"—Delgolla, 20b 115s; 9b 73s 6d; 41 115s.

Ex "Orestes"—Annewatte, 20b 16b 95s withdrawn

Ex "Golconda"—Elmshurst, 7b 92s.

Ex "Chusan" North Matale, 20b 118s 6d. Aloowihare 620b 123s; 20b 118 6d.

Ex "City of Canterbury"—Hantane, 14b 100s d b44s.

Ex "Rome"—Wiharagama, 22b 117s 6d; 7b 83s 6d.

Ex "Polyphemus"—Wiharagama, 20b 118s; 9b 92s.

Ex "Mira"—Rajawelle, 75b 120s; 25b 97s.

Ex "Myrmidon"—Rajawelle, 5b 85s; 2b 69s; 1b 90s.

MINCING LANE, March 20th, 1891.

Ex "Polyphemus"—Mahaberia, 20 bags 133s; 11b 133s; 14b 123s 6d; 4b 6s.

Ex "Laertes"—Kondesalle, 15 bags 133s; 20b 123s 6d 18b 123s 6d; 13b 89s.

Ex "Legislator"—Macoolussa, 16 bags 128s; 1b 83s; 1b 57s; 26b 131s; 20b 108s 6d; 6b 90s 6d; 6b 88s 6d; 2b 41s.

Ex "Sutlej"—Palli, 20b 130s 6d; 20 130s 6d; 115b 130s 6d; 8b 84s 6d; 1b 85s.

Ex "Navarino"—Palli, 128b 131s; 13b 84s 6d; 2b 85s.

Ex "Legislator"—Beredewelle COC, 33b 131s 6d; 2b 100s; 5b 110s; 2b 50s; 1b 40s.

Ex "India"—Hunasgeria, 16b 129s 6d; 1b 46s; 1b 41s; 12b 130s; 1b 26s; 1b 86s.

Ex "Sobraon"—Hylton, 15b 121s; 3b 110s; 2b 52s; 10b 115s; 2b 105s.

Ex "Laertes"—Udapolla, 168b 120s 6d; 41b 115s; 7b 70s; 5b 31s 6d.

Ex "Navarino"—Ross, 37b 119s; 2b 68s 6d; 1b 65s 6d.

Ex "Chusan"—Maragalla, 17b 100s; 6b 72s; 1b 27s.

Ex "Clan Sinclair"—Gangwarily, 20b 123s 6d; 3b 50s; 2b 46s.

Ex "Pakling"—Ingurugalla, 31b 125s 6d; 9b 70s; 1b 37s. Asgeria, 26b 126s; 6b 70s; 7b 44s; 2b 2s 6d. Kirimettia, 14b 22s 6d; 3b 70s. Woodslee, 33b 129s 6d; 10b 72s; 1b 31s. Bulatwatte, 46b 129s 6d; 7b 72s; 1b 31s.

Ex "Manora"—North Matale, 53b 125s 6d. Alloowihare, 62b 129s 6d; 17b 122s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, March 6th, 1891.

Ex "Oanfa"—Osborne, 2 cases 1s 7d; 1 1s 4d.

Ex "Capella"—Galaha EF, 1 case 3s 9d; 4 2s 9d; 1 1s 10d; 1 1s 6d; 4 1s 7d. Katooloya, 2 cases 2s 1d; 2 1s 8d; 2 1s 6d; 2 1s 4d.

Ex "Persia"—Dangkande (OBEC), 4 cases 1s 5d; 1 1s 10d.

Ex "Traveller"—Delpotonoya, 2 bags 1s 9d.

MINCING LANE, March 20th, 1891.

Ex "Cuzco"—Tunisgalla 6 cases 1s 9d; 1 1s 4d; 1 1s 9d.

Ex "Legislator"—WHM, 3 cases 2s 6d. Lunagalla, 2 cases 2s 1d; 1 2s 2d; 1 1s 11d; 1 1s 5d; 1 1s 8d.

Ex "Chusan"—Gallawatte, 16 cases 2s 2d; 1 1s 11d.

Ex "Golconda"—Laxapanagalla 1 case 2s 2d; 4 1s 6d; 1 1s 11s. Woodslee 6 cases 1s 10d; 2 1s 7d; 2 1s 4d; 2 1s 9d; 1 10d.

Ex "Legislator"—PHSP, 1 case 1s 2d; 1 1s 4d; 3 1s 6d; 6 1s 7d; 3 1s 6d.

Ex "Engineer"—Old Madegama 3 cases 3 2s 2d; 4 2s 3d.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 11.] COLOMBO, APRIL 20, 1891. { PRICE :—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room on the 8th April, the undermentioned lots of Tea (82,715 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	D F, in estate mark	165	23	ch	bro pek	2415	47 bid
2	Do	167	16	do	pekoe	1520	43
3	Do	169	30	do	do No 2	2850	41
4	Do	171	19	do	pek sou	1710	39
5	Do	173	12	do	fans	1200	35
6	D E	174	9	do	fans	765	38
7	Suduganga	176	4	hf-ch	bro or pek	200	54
8	Do	177	10	do	pekoe	500	44
9	Do	178	14	do	pek sou	700	41
10	Do	180	5	do	sou	250	36
11	Panapitiya	181	11	do	pekoe	552	31
12	Labugama	183	6	do	bro or pek	552	47
13	Do	184	11	do	bro pek	440	53
14	Do	185	29	do	pekoe	1160	45
15	Do	187	17	do	sou	680	40
16	Do	189	11	do	pek fan	495	38
17	Do	190	2	do	pk dust	150	31
18	Do	191	6	do	red leaf	300	30
19	Cruden	192	22	do	sou	1100	38
20	Logan	194	29	do	bro pek	1450	53
21	Do	196	28	do	pekoe	1260	46
22	Do	198	47	do	pek sou	2115	43
23	Do	200	12	do	sou	540	39
24	Do	202	5	do	red leaf	225	34
25	Do	203	8	do	dust	480	31
26	Blackburn	204	55	box	pekoe	1100	48 bid
27	Do	206	16	ch	do	1600	44 bid
28	Do	208	4	do	pek sou	365	41 bid
29	Do	209	1	do	dust	123	32
30	H J R	210	6	do	bro pek	570	50
31	Do	212	8	do	pekoe	640	44
32	Do	214	7	do	pek sou	595	39
33	Do	216	1	do			31
			1	hf-ch	bro tea	150	
34	Do	217	1	do	dust	80	30
35	Fankerton	218	23	do	pek fan	1035	32 bid
36	Mocha	220	30	do	bro pek	1565	69
37	Do	222	44	ch	pekoe	4000	52
38	Do	224	31	do	pek sou	2790	47
44	E W	236	15	do	congou	675	37
45	Do	237	7	do	dust	490	33
46	Do	238	7	do	fans	420	40
47	Do	239	3	do	red leaf	130	30
48	Do	240	1	do	bro tea	55	38
49	Dunbar	241	25	ch	bro pek	2500	54 bid
50	Do	243	25	do	pekoe	2250	46
51	Agra Ouvah	245	32	hf-ch	pekoe	1440	46
57	Fankerton	255	5	do	pek fans	225	33
58	Agra Ouvah	256	42	do	bro pek	1890	55 bid
59	Tangapoo Tottum	258	12	do	bro pek	1320	50 bid
60	Do	260	21	ch	pekoe	2520	44 bid
61	Do	262	13	do	pek sou	1456	41
62	Do	264	6	do	congou	672	34
63	Maria	265	1	do	bro mix	90	35
64	Do	266	3	hf-ch	dust	210	31
70	F T	276	31	do	bro pek	3100	49 bid
71	Do	278	18	do	pek sou	1800	42 bid
72	Do	280	1	do	bro pek	93	35
73	Do	281	1	hf-ch	pekoe	41	35
74	Do	282	1	do	pek sou	38	30
75	Gonavy	283	49	ch	bro pek	4900	50 bid
76	Do	285	15	do	pekoe	1350	46
77	Do	287	10	do	pek sou	900	43
78	Do	289	2	do	dust	300	38

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room on the 8th April, the undermentioned lots of Tea (87,460 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	D E O	1	1	hf-ch	fans	55	35
2	Do	2	7	do	red leaf	385	30
3	Do	4	1	do	dust	75	30
4	A S O	5	4	hf-ch	red leaf	200	30
5	Do	6	2	do	fans	100	31
6	K	7	92	do	pek sou	4140	42
7	K	9	1	do	dust	75	31
8	M, in estate mark	10	2	do	bro tea	112	25
13	G H K, in estate mark, Ceylon	18	18	ch	pek sou	1800	39
14	Do	20	3	hf-ch	bro sou	180	33
15	Do	21	3	do	sou	120	28
16	Do	22	1	do	dust	57	26
17	K	23	1	ch	sou	100	28 bid
18	K	24	8	hf-ch	pek dust	560	32 bid
19	Woodend	25	15	ch	bro pek	1500	51 bid
20	Do	28	22	do	pekoe	2200	43
21	Do	30	5	do	pek sou	450	38
22	Do	32	1	do	dust	135	29 bid
23	Do	33	1	do	congou	95	30
24	Nahalma	34	46	hf-ch	bro pek	2300	50 bid
25	Do	36	42	ch	pekoe	3990	42 bid
26	Do	38	3	do	pek sou	300	39
27	Do	39	1	hf-ch	dust	80	31
28	A & D T	40	4	do	dust	300	32 bid
29	Relugas	41	28	do	bro pek	1540	53 bid
30	Do	43	15	ch	pekoe	1650	43 bid
31	Do	45	23	do	pek sou	2300	42
32	Do	47	1	do	dust	100	30 bid
33	Do	48	1	hf-ch	red leaf	42	27
36	Horagoda	51	6	ch	bro pek	600	51 bid
37	Do	53	20	do	pekoe	1900	45
38	Do	55	1	hf-ch	pek sou	50	40
39	Do	56	1	do	dust	80	30
40	C	57	1	do	dust	68	30
45	R E C	66	42	do	pekoe	4200	45
46	Nahalma	68	39	do	bro pek	2145	51 bid
47	Do	70	42	ch	pekoe	4200	43 bid
48	Do	72	3	do	pek sou	300	38
49	Do	73	1	hf-ch	dust	80	31
54	B U S, in estate mark	81	8	ch	congou	880	34
62	Nugagalla	96	13	do	bro or pek	650	56 bid
63	Do	98	37	do	pekoe	1850	50
64	Do	100	2	do	dust	160	32
65	Mohedin	25	2	do	bro pek	100	50
66	Do	31	4	do	pekoe	160	45
67	Do	52	5	do	pek sou	200	40
68	Do	82	1	do	bro pek fans	50	28
69	Do	94	1	do	congou	50	31
70	Do	27	3	do	red lef	120	29
71	Do	29	1	do	pek dust	58	29
72	P O	3	4	do	bro pek	212	54
73	Do	8	3	do	pekoe	162	42
74	Do	21	12	do	pek sou	716	38
75	Do	14	3	do	unas	172	39
76	Do	16	1	do	congou	51	27
77	Do	35	1	do	dust	78	29
84	K	111	7	box	bro pek	140	45 bid
85	O	112	1	ch	dust	80	28
86	Ossington	113	6	hf-ch	bro pek	300	48
87	Do	114	5	do	pekoe	250	50
88	O D	115	1	do	bro pek	35	40
89	Do	116	1	do	pekoe	52	37
90	Do	117	1	do	pek sou	24	30
91	Do	118	1	box	unas	23	28

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room on the 8th April, the undermentioned lots of Tea (185,553 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	Lesmoir	142	1	ch	sou	90	36
2	Do	144	4	hf-ch	dust	180	34
3	Augusta	146	1	ch	sou	90	36
4	Do	148	4	hf-ch	dust	280	34
5	New Peradeniya	150	4	do	sou	360	36
6	Do	152	2	do	red leaf	170	32
7	Do	154	27	hf-ch	dust	1811	35
8	T	156	8	do	dust	640	33
9	T	158	11	ch	bro mix	1210	37
10	T	160	1	do	sou	100	32
11	Fetteresso	162	2	do	sou	190	38
12	Do	164	1	do	dust	150	33

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
13	P	166	2	ch	fans	138	34
14	Harangalla	168	25	do	bro pek	2500	55
15	Do	170	38	do	pekoe	3420	43
16	K H L	172	2	do	dust	280	32
17	Do	174	4	do	bro mix	400	33
18	Katugalla	176	5	do	bro pek	550	50
19	Do	178	5	do	pekoe	500	44
20	Do	180	3	do	pek sou	330	39
21	A K	182	2	do	red leaf	220	33
22	Beverley	184	1	hf-ch	pek sou	55	40
23	Do	186	3	do	sou	165	36
24	Do	188	2	do	pek dust	150	34
25	Do	190	3	do	dust	225	33
26	Do	192	1	do	congou	55	32
27	California	194	1	do	bro pek	47	35
28	Do	196	1	do	pekoe No. 1	43	44
29	Do	198	1	do	pekoe No. 2	42	42
30	Koppelana	200	11	do	unas	495	39
31	Wallahanduwa	202	9	do	bro pek No. 1	585	53
32	Do	204	18	do	pekoe No. 1	990	46
33	Do	206	16	do	pek sou No. 1	800	42
34	Do	208	1	do	bro pek No. 2	70	55
35	Do	210	3	do	pekoe No. 2	135	44
36	Do	212	6	do	pek sou No. 2	280	42
37	S P A	214	1	do	pekoe	36	42
38	Do	216	13	do	sou No. 1	715	39
39	Do	218	18	do	sou No. 2	900	39
40	Do	220	7	do	bro tea	345	32
41	Do	222	2	do	bro mix	120	32
42	S P K	224	2	do	pekoe	101	33
43	Galdola	226	1	do	bro pek	65	47
44	Do	228	1	do	pekoe	46	40
45	Do	230	1	do	pek sou	50	39
46	Do	232	1	do	sou	62	37
48	Deniyaya	236	5	do	bro pek	300	50
49	Do	238	8	do	pekoe	400	42
50	Do	240	4	do	pek sou	200	39
51	Do	242	2	do	sou	100	33
52	L B K	244	3	ch	bro pek	300	32
53	S K	246	5	hf-ch	unas	265	40
54	Do	248	5	do	dust	410	32
55	Kirimettia, L M	250	10	do	bro pek	505	54
56	Do	252	16 / 1	ch / hf-ch	pekoe	1610	45
57	Do	254	3	do	pek sou	160	38
58	Do	256	4	do	pek fan	275	39
59	Weddigodde	258	1	do	bro pek	50	50
60	Do	260	6	do	pekoe	300	42
61	Do	262	7	do	pek sou	350	40
62	Do	264	1	do	fans	50	35
63	St. Catherine	266	9	ch	bro pek	810	52
64	Do	268	6	do	pekoe	540	45
65	Do	270	6	do	pek sou	480	42
66	Do	272	1	hf-ch	pek fans	49	36
67	Do	274	1	do	dust	60	32
68	E D K E, in estate mark	276	2	do	red leaf	110	28
69	Bandarapolla	278	30	do	bro pek	1500	54
70	Do	280	39	do	pekoe	1950	46
71	Do	282	35	do	pek sou	1575	43
72	N C	284	7	do	bro pek	350	47
73	Do	286	3	do	sou	135	33
74	Do	288	2	do	dust	140	33
75	Bandarapolla	290	22	do	bro pek	1100	54
76	Do	292	23	do	pekoe	1150	46
77	Do	294	22	do	pek sou	945	44
78	Farm	296	8	ch	bro pek	800	52
79	Do	298	8	do	pekoe	720	45
80	Do	300	9	do	pek sou	702	41
81	Do	302	1	do	sou	85	31
82	Do	304	1	hf-ch	red leaf	38	26
83	Do	306	1	do	dust	60	33
84	Wevegoda	308	10	do	bro pek	600	50
85	Do	310	11	do	pekoe	550	41
86	Do	312	19	do	pek sou	1010	39
90	F F	320	3	ch	bro pek dust	407	36
91	Do	322	1	do	dust	136	33
92	Traquair	324	3	hf-ch	bro pek	164	49
93	Do	326	5	do	pekoe	254	43
94	Do	328	10	do	pek sou	510	40
95	Do	330	2	do	congou	85	29
96	Deyanella	332	35	do	bro pek	2100	62
97	Do	334	22	ch	pekoe	2200	50
98	Do	336	1	do	sou	100	39
99	Digdolla	338	6	do	bro pek	600	48
100	Do	340	7	do	pekoe	700	40
101	Do	342	16	do	pek sou	1600	37

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
102	P C H Galle, Cross in estate mark	344	2	hf-ch	bro pek	100	45
103	Do	346	7	do	pek sou	350	39
104	Do	348	2	do	pekoe	80	30
105	Columbia	350	24	do	bro pek	1440	71 bid
106	Do	352	21	do	pekoe	945	56
107	Do	354	2	do	pek sou	100	45
108	Do	356	2	do	dust	140	34
109	Palamcotta	358	1	do	dust	85	32
110	Rambodde	360	13	ch	bro pek	1430	60
111	Do	362	13	do	pekoe	1309	50
112	Do	364	15	do	pek sou	1500	44
113	Do	366	1	do	congou	100	36
114	Do	368	2	hf-ch	dust	400	33
115	St. Leonard's	370	1	do	pek sou	80	36
116	Weyvelhena	372	11	do	bro or pek	1155	54
117	Do	374	26	do	or pek	2210	48
118	Do	376	31	do	pekoe	2480	46
119	Do	378	3	do	sou	240	38
120	Do	380	3	hf-ch	dust	240	32
123	Esperanza	386	3	do	bro or pek	168	46
124	Do	388	13	do	or pek	650	61
125	Do	390	41	do	pekoe	1886	48
126	Berragalla	392	3	ch	bro pek	390	44
127	Do	394	5	do	pekoe	525	44
128	Do	396	3	do	pek sou	300	42
129	Waveodon	398	1	do	dust	100	33
130	Yataderia	400	14	do	bro pek	1540	53
131	Do	402	31	do	pekoe	3100	44
132	Do	404	49	do	pek sou	4410	42
133	Do	406	10	do	bro tea	900	36
134	Doonevale	408	6	do	bro pek	600	51
135	Do	410	22	do	pekoe	1980	43
136	Do	412	1	do	bro mix	105	31
137	Do	414	1	do	fans	115	34
138	Do	416	1	do	dust	140	31
139	Warwick	418	3	hf-ch	congou	145	39
140	Do	420	7	do	dust	560	34 bid
141	Do	422	2	do	bro mix	110	31
142	Clyde	424	5	ch	bro pek	530	51
143	Do	426	15	do	pekoe	1425	44
144	Do	428	11	do	pek sou	1045	42
145	H O	430	5	do	congou	450	37
146	Do	432	4	do	fans	480	36
147	Do	434	5	do	bro tea	500	32
148	Do	436	3	do	dust	450	31
149	C, in estate mark	438	18	do	bro tea	1800	28
150	L B K	440	5	do	pekoe	505	28
151	Thornfield	442	57	hf-ch	bro pek	3420	58
152	Do	444	34	ch	pekoe	3400	47
153	Do	446	14	do	pek sou	1372	43
154	Do	448	4	hf-ch	dust	320	33
155	Tellisagalla	450	2	do	bro mix	90	33
156	Leaston	452	1	do	bro tea	85	34
157	Do	454	10	hf-ch	dust	750	32
158	Stisted	456	8	do	bro pek	480	61
159	Do	458	26	do	pekoe	1456	48
160	Do	460	8	do	pek sou	400	43
161	Do	462	1	do	dust	81	31
162	Pattigama	464	2	ch	dust	300	34
163	Avisawella	466	2	do	unas	210	41
164	Amblakande	468	7	do	bro or pek	700	51
165	Do	470	11	do	pekoe	990	45
166	Do	472	3	do	souchong	270	39
167	Do	474	2	do	bro mix	240	36
168	Do	476	11	do	bro or pek	1100	55
169	Do	478	18	do	pekoe	1620	45
170	Do	480	7	do	souchong	630	39
171	Do	482	1	hf-ch	bro tea	120	35
172	P A G	484	2	ch	bro pek	205	45
173	Do	486	7	do	pekoe	586	41
174	Do	488	2 / 1	do / hf-ch	pek fans	336	32
175	Do	490	11	do	red leaf	569	26
176	Macaldenia	492	18	do	bro pek	1080	55 bid
177	Do	494	11	do	pekoe	550	50
178	Do	496	10	ch	pek sou	1050	44
179	Do	498	1	do	souchong	100	40
180	Do	500	1	hf-ch	bro mix	55	38
181	Do	502	2	do	dust	148	32
182	Do	504	1	box	or pek	10	90
183	Do	506	1	do	flowery pek	10	66
184	Do	508	2	boxes	flowery dust	20	39
185	O	510	3	ch	pekoe	300	38
186	Galkadua	512	7	hf-ch	bro pek	350	48
187	Do	514	12	do	pekoe	600	43
188	Do	516	11	do	pek sou	550	40
189	Angroowella	518	1	do	dust	75	34
190	C C T G	520	1	do	dust	50	30

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
191	Middleton	522	50 hf-ch	bro pek	3250	57
192	Do	524	16 ch	pekoe	1760	47
197	Dehiowita	534	12 do	bro pek	1260	54
198	Do	536	31 do	pekoe	3100	44
199	Do	538	10 do	pek sou	950	41
200	Do	540	1 do	bro tea	120	34
201	Do	542	1 do	dust	160	31
202	T	544	1 hf-ch	bro tea	55	28
203	Silver Valley	546	11 do	pekoe	550	42
204	Do	548	3 do	red leaf	134	34
205	Do	550	1 do	congou	48	32
206	A B C	552	2 do	dust	200	33
207	B E R	554	7 ch	or pek	630	49
208	Do	556	3 do	bro pek	300	46
209	Do	558	22 do	pek sou	1980	39
210	Do	560	2 do	dust	280	32
211	Lankapura W	562	4 boxes	hyson No. 1.	80	69
212	Do	564	22 do	hyson No. 2.	440	46
213	Do	566	4 do	Imperial	80	56
214	Do	568	4 do	hyson mix	80	45
215	Do	570	3 do	hyson fans	60	31
216	W G	572	3 hf-ch	bro pek fans	195	39
217	K	574	1 ch	pek sou	100	40
218	K	576	1 do	dust	160	31
219	Uda Radella	578	1 do	red leaf	100	23
220	Do	580	2 do	red leaf	160	29
229	W, in estate mark	598	5 do	pekoe	252	40
230	P, in estate mark	600	2 do	pek sou	110	37
231	F H, in estate mark	2	16 do	pek dust	1330	31
232	Panelkande	4	1 do	bro; pek	60	45
233	Do	6	2 do	pekoe	71	41
234	Do	8	4 do	pek sou	180	36
235	Do	10	1 do	bro tea	45	29
236	Do	12	3 do	red leaf	150	27
237	Polatagama	14	42 hf-ch	bro pek	2520	61
238	Do	16	90 do	pek	4500	47
239	Do	18	111 do	pek sou	4995	43
240	Horagaskelle	20	6 do	bro pek	355	52
241	Do	22	6 do	pek	312	42
242	Do	24	11 do	pek sou	616	42
243	Do	26	1 do	bro mix	82	28
244	Putupaula	28	4 do	dust	240	29
245	Palmerston	30	6 do	bro pek	360	60
246	Do	32	11 ch	pek	1100	51
247	Do	34	6 do	pek sou	600	43
248	St. Heliers	36	24 do	bro pek	2400	49 bid
249	Do	38	15 do	pek	1425	45
250	Do	40	20 do	pek sou	1900	42
251	Do	42	3 do	bro tea	300	30
252	Do	44	4 hf-ch	dust	280	30
253	H, in estate mark	46	2 do	do	111	30
254	Avisawella	48	4 ch	sou	400	35
255	Do	50	3 do	dust	450	31

Mr. E. Benham put up for sale at the Chamber of Commerce Sale-room on the 15th April, the undermentioned lots of Tea (8,020 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	O B E C, in estate mark Havilland, Ceylon	34	25 hf-ch	bro pek	1375	52 bid
2	Do	36	41 do	pekoe	2050	48
3	Do	38	27 do	pek sou	1215	41 bid
4	Do	40	32 do	sou	1280	42 bid
5	Do	42	20 do	dust	1200	34 bid
6	W O	44	9 ch	bro tea	900	34

Messrs. Somerville & Co. put up for sale at th Chamber of Commerce Sale-room on the 15th April, the undermentioned lots of Tea (61,330 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight. lb.	c.
1	W R T, in estate mark	13	10 hf-ch	dust	700	30
2	Do	14	1 do	pek fans	60	35
3	Do	15	4 do	bro mix	400	38
10	C A, in estate mark	22	4 do	unas	232	42
11	Do	23	5 do	bro mix	290	37
	Do	24	3 do	dust	174	30

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
13	Naseby	25	8 hf-ch	bro pek	400	49 bid
14	Do	26	14 do	pekoe	700	44 bid
15	Do	27	2 do	bro tea	154	34 bid
16	Ederapolla	28	30 do	bro pek	1500	52
17	Do	29	5 ch	or pek	450	46
18	Do	30	36 do	pekoe	3240	45
19	Do	31	14 do	pek sou	1260	42
20	South Wana Rajah	32	13 do	bro pek	1300	60 bid
21	Do	33	31 do	pekoe	3100	49 bid
22	Do	34	10 do	pek sou	1000	45 bid
23	St. Andrews	35	8 hf-ch	or pek	528	66
24	Do	36	17 do	bro pek	1105	49 bid
25	Do	37	38 do	pekoe	2432	48
26	L B K	38	2 ch, 1 hf-ch	pekoe	225	32 bid
27	Do	39	12 ch, 1 hf-ch	bro tea	1255	36
28	Pallai	40	33 do	pek fans	1485	27 bid
29	S	41	29 do	bro pek	1595	52
30	S	42	31 ch	pekoe	3100	46
31	S	43	29 hf-ch	pek sou	1595	42
32	E C E	44	5 ch, 5 hf-ch	bro mix	825	29
33	Do	45	8 ch	dust	1229	29
34	W L P, in estate mark	46	15 do	pek sou	1449	36
35	W	47	17 hf-ch	bro sou	895	38
36	B B S	48	1 ch	congou	112	30
37	Do	49	2 do, 1 hf-ch	pekoe	274	32
38	Do	50	1 do	dust	85	31
39	T K	51	5 ch	bro mix	559	31
40	Killin	52	9 do	bro pek	900	50
41	Do	53	8 do	pekoe	760	43 bid
42	Do	54	4 do	pek sou	360	42
43	Do	55	2 do	bro tea	200	33
44	Ovoca A I	56	12 do	bro pek	1380	61 bid
45	Do	57	32 do	pekoe	3200	49 bid
46	Do	58	20 do	pek sou	2000	46
47	Do	59	13 do	bro mix	1560	43
48	Do	60	13 hf-ch	dust	975	25
49	Do	61	5 ch	bro tea	530	30
50	G W	62	4 do	bro mix	400	33
51	A T	63	11 hf-ch	bro pek	559	48
52	Do	64	14 do	pekoe	700	42 bid
53	Do	65	14 do	pek sou	701	39
54	R X	66	2 ch	pek dust	276	33
55	Do	67	1 do	dust	140	32
56	Do	68	1 do	bro tea	120	36
57	C T M	69	4 do	bro mix	360	35
58	Do	70	2 hf-ch	dust	140	32
59	Kitulgalla	71	4 ch	bro pek	400	51
60	Do	72	9 do	pekoe	720	43
61	Do	73	6 do	pek sou	480	41
62	Lulu	74	5 do	bro pek	500	50
63	Do	75	3 do	pekoe	300	42 bid
64	Do	76	4 do	pek sou	400	41 bid
65	Allakolla	77	16 hf-ch	bro pek	1010	53
66	Do	78	23 ch	pekoe	2415	46
67	Do	79	16 do	pek sou	1600	41
68	Do	80	1 hf-ch	dust	95	31
69		81	5 do	dust	350	25

Mr. E. John put up for Sale at the Chamber of Commerce Sale-room on the 15th April, the undermentioned lots of Tea (91,233 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	D E	10	4 ch	fans	340	38
2	Ayr	11	2 hf-ch	bro pek	100	40
3	Do	12	18 do	bro pek	900	58
4	Do	14	25 do	pekoe	1050	46
5	Do	16	26 do	pek sou	1092	43
6	Do	18	6 do	congou	258	37
7	Do	19	3 do	fans	150	37
8	Do	20	1 do	pek dust	71	32
9	D F D	21	6 ch	pek sou	570	48
10	Albion	23	20 do	bro pek	2200	60
11	Do	25	16 do	pekoe	1600	51
12	Do	27	15 do	pek sou	1500	45
13	Acrawatte	29	7 do	bro pek	735	57
14	Do	31	8 do	pekoe	760	48
15	Do	33	12 do	pek sou	1080	45
16	Kandenewera	35	54 hf-ch	bro or pek	2700	50
17	Do	37	38 do	pekoe	1900	44
18	Do	39	25 ch	pek sou	2730	42
19	Do	41	14 do	pek sou	1540	41

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
20	K G	43	22 hf-ch	bro pek	1320	53
21	Do	45	11 ch	pekoe	1320	47
22	Do	47	11 do	pek sou	1320	45
23	Do	49	3 hf-ch	dust	240	32
24	Gonakelle Factory	50	4 ch	bro or pek	420	56
25	Do	51	7 do	bro pek	735	45
26	Kandenewera	53	25 do	sou	2750	withd'n.
27	Do	55	13 do	unas	1300	41
28	Ottery	57	33 do	bro pek	3200	58 bid
29	Do	59	44 do	pekoe	3960	48 bid
30	Do	61	17 do	pek sou	1530	45
31	Do	63	4 do	bro mix	520	33
32	L	64	19 do	congou	1710	41
33	L	66	13 do	fans	1820	34
34	D F, in estate mark	68	15 ch	bro pek	1575	50
35	Do	70	18 do	pekoe	1710	45
36	Do	72	18 do	„ No 2	1710	43
37	Do	74	28 do	pe sou	2520	41
38	Do	76	2 do	dust	300	31
39	Great Valley	78	14 do	bro pek	1540	50 bid
40	Do	80	17 do	pekoe	1700	46
41	Do	82	12 do	pek sou	1140	42
42	Do	84	1 do	sou	95	38
43	Do	85	3 hf ch	dust	210	31
44	Tientsin	87	28 do	bro pek	1680	57
45	Do	89	62 ch	pek sou	5580	45 bid
46	Do	101	1 do	dust	152	33
47	Do	102	1 do	fans	124	36
48	Agra Ouvah	103	25 hf-ch	bro or pek	1250	60 bid
49	Do	105	18 do	or pek	810	52 bid
50	Do	107	42 do	bro pek	1890	52 bid
51	Do	109	46 do	pekoe	2070	46 bid
52	Do	111	30 do	pek sou	1350	45
53	Do	113	6 do	pek sou No. 2	270	41
54	Madooltenne	114	12 ch	bro pek	1320	51
55	Do	116	12 do	pekoe	1200	43
56	Do	118	12 do	pek sou	1200	40
57	Albion	120	16 do	bro pek	1760	58 bid
58	Do	122	16 do	pekoe	1600	51
59	Do	124	18 do	pek sou	1800	45
60	Do	126	1 do	sou	90	39
61	Do	127	4 do	dust	600	33
62	Do	128	2 do	red leaf	200	34
63	Gonavy	129	49 do	bro pek	4900	57
64	Eila	131	15 do	bro pek	1500	52
65	Do	133	25 do	pekoe	2000	45
66	Do	135	19 do	pek sou	1520	43
67	Do	137	2 do	unas	196	38
68	Do	138	2 do	pek dust	250	32

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room on the 15th April, the undermentioned lots of Tea (136,553 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	A S C	1	1 hf-ch	pek dust	50	32
2	Do	2	3 do	red leaf	150	29
3	K	3	7 box	bro pek	140	50
4	K	5	50 hf-ch	pekoe	2250	46
5	K	7	70 do	pek sou	3150	43
12	D G A O Cross, in estate mark	18	50 box	bro or pek (Not exceeding 28 lb gross.)	1000	52 bid
13	Do	20	46 ch	bro pek	4600	49 bid
14	Do	22	41 do	pekoe	4100	46
15	Do	24	58 do	pek sou	5800	43
16	Relugas	26	29 hf-ch	bro pek	1595	52 bid
17	Do	28	17 ch	pekoe	1870	42 bid
18	Do	30	24 do	pek sou	2400	42
19	Do	32	3 do	dust	268	33
23	Agra oya	38	18 do	or pek	900	52 bid
24	Do	40	12 ch	bro pek	1200	52 bid
25	Do	42	15 do	pekoe	1500	45 bid
26	Do	44	17 do	pek sou	1700	43
27	Do	46	3 do, 1 hf-ch	unas	350	33
28	Do	47	4 do	dust	240	33
29	I B, in estate mark	48	160 box	or pek (Not exceeding 28 lb. gross.)	3240	55 bid
30	Do	50	139 ch	pekoe	11815	43
31	Do	52	4 do	dust	600	33
32	Woodend	53	13 do	bro pek	1300	51
33	Do	55	17 do	pekoe	1615	44
34	Do	57	5 do	pek sou	425	42
35	Do	58	1 do	dust	120	32

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
41	Harrow	69	7 do	bro pek	420	52
42	Do	71	12 do	pekoe	660	45
43	Comillah	73	2 box	bro or pek	20	68 bid
44	Do	74	10 hf-ch	bro pek	550	48
45	Do	76	16 do	pekoe	800	44
46	Do	78	12 do	pek sou	600	42
47	Do	80	1 do	dust	50	31
48	C C	81	6 do	pekoe	300	43 bid
49	Do	82	4 do	pek sou	240	36 bid
50	S C R	83	17 do	bro pek	935	47 bid
51	Do	85	47 do	pekoe	2350	42
52	K P W	87	23 do	bro pek	1150	52
53	Do	89	35 do	pekoe	1575	48
54	Do	90	37 do	pek sou	1665	45
55	Do	92	7 do	sou	315	40
56	Do	93	2 do	dust	140	32
57	A C W	94	50 do	pe ksou	2500	44
58	Harrow	96	4 do	bro pek	240	55
59	Do	97	7 do	pekoe	385	47
60	Do	98	18 do	pek sou	1030	45
61	Do	100	3 do	bro tea	120	32
66	F, in estate mark	107	2 ch	sou	160	34
67	L	108	1 do	bro mix	80	26
68	W N	109	13 hf-ch	bro pek	650	54 bid
69	Do	111	7 do	pek sou	350	43
70	P O	113	12 do	unas	692	43
71	Do	115	1 do	congou	50	30
72	Do	116	1 do	dust	42	31
73	Shannon	117	65 do	bro pek	3575	52 bid
74	Do	119	38 ch	pekoe	3420	43
75	Do	121	37 do	pek sou	3330	39
76	Do	123	3 hf-ch	bro tea	141	28
77	Do	124	2 do	dust	172	31
78	A G C	125	14 do	dust	980	32

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

Mincing Lane, March 27th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 27th March :—

Ex "Legistor"—Kirklees, 1b 111s; 3c 110s; 2c 105s; 1t 103s 6d; 1c 131s. Gampaha, 1b 111s; 5c 111s 6d; 3c 1b 107 6d; 1c 105s 6d; 1c 1b 137s 6d.

Ex "Cuzco"—Dammeria, 1b 109s; 2c 107s 6d; 1b 101s; 1b 105s.

Ex "Manora"—Kirkoswald, 1b 112s 6d; 4c 1t 115s; 5c 109s 6d; 1b 105s 6d; 1c 1b 141s. Sheen, 1b 113s; 3c 1t 116s; 4c 1b 110s; 1b 105s.

Ex "Pakling"—Venture, 1b 114s; 2c 114s; 2c 1b 112s; 1b 105s; 1t 140s.

Ex "Manora"—Eilaoya, 1c 2t 1b 112s 6d; 4c 1t 111s; 4t 1b 111s; 5t 107s; 22t 1b 106s 6d; 1c 2t 1b 104s; 2t 133s 6d; 2t 132s; 5t 99s 6d; 5t 100s; 5t 1b 99s 6d. Yapame, 1b 113s. Mahauva, 1c 1b 104s 6d; 2c 104s; 1b 101s; 1b 110s. Haputale, 1c 111s; 2c 1b 107s 6d 1b 106s 6d; 1t 134s.

Ex "India"—Ravenswood, 1b 120s.

Ex "Manora"—Aldie, 1b 103s.

Ex "Navarino"—Mt. Vernon, 1b 115s; 4c 112s 6d; 5c 108s 6d; 1c 106s; 1c 139s.

Ex "Manora"—Rangbodde, 1b 115s; 2c 113s 6d; 3c 1b 105s; 1t 134s; 1b 98s; 1b 106s. Gowerakellie, 1c 112s; 3c 2b 109s; 1t 134s. Gonakelle, 3c 1b 108s 6d; 1b 104s; 1c 99s 6d; 1b 95s; 1b 106s.

CEYLON COCOA SALES IN LONDON.

(From Wilson, Smithett, & Co's. Circular.)

Mincing Lane, March 27th, 1891.

Ex "Pakling"—Palli, 2 bags 90s; 7 bags 67s. Amba, 3 bags 82s. Victoria, 1 bag 88s; 3 bags 44s 6d; 2 bags 22s; 9 bags 125s. Elmhurst, 1 packet 55s. Horang Kanda, 12 bags 123s; 1 bag 76s; 31 bags 123s; 3 bags 84s; 1 bag 75s; 2 bags 56s; 5 bags 42s 6d; 1 bag 32s.

Ex "Cuzco"—Dea Ella, 10 bags 108; 1 bag 65s; 1 bag 66s; 1 bag 65s; 1 bag 40s. Yattawatte, 99 bags 128s 6d; 4 bags 71s; 2 bags 75s; 2 bags 83s.

Ex "Manora"—Crystal Hill, 18 bags 95s; 7 bags 45s.

Ex "Golconda"—Crystal Hill, 34 bags 105s.

Ex "Orestes"—Lower Haloya, 10 bags 115s.

Ex "Malwa"—Gangwarily, 15 bags 125s.

Ex "Pak Ling"—Mahaberia, 8 bags £6; 6 bags 93s; 9 bags 24s.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 12.] COLOMBO, MAY 4, 1891. PRICE :—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room on the 15th April, the undermentioned lots of Tea (136,569 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	B B B B	52	2 ch	bro tea	180	31
2	N M, in estate mark	54	2 do	red leaf	160	31
3	Bearwell	56	2 hf-ch	sou	100	36
4	Do	58	1 do	red leaf	35	25
5	C B	60	8 ch	bro sou	800	43
6	Do	62	5 hf-ch	pek dust	350	35
7	Do	64	5 do	dust	400	31
8	Uvakelle	66	6 do	or pek	330	56
9	Do	68	9 do	bro pek	450	48
10	Do	70	8 do	pekoe	360	44
11	Do	72	3 do	fans	180	35
12	Do	74	2 do	sou	90	38
13	N, in estate mark	76	9 do	dust	675	32
14	Dehiowita	78	15 ch	bro pek	1575	52
15	Do	80	25 do	pekoe	2500	44
16	Do	82	11 do	pek sou	1045	42
17	Do	84	1 do	bro tea	120	35
18	B & D	86	4 do	dust	500	30
19	Atherfield	88	10 hf-ch	sou	500	40
20	Do	90	1 do	bro tea	50	37
21	Do	92	3 do	dust	240	31
22	C R D	94	3 do	red leaf	165	32
23	Do	96	6 do	dust	330	33
24	Meddetenne	98	6 ch	bro pek	630	56
25	Do	100	17 do	pekoe	1615	46
26	Do	102	1 do	dust	145	31
27	Mousakelle	104	28 hf-ch	bro pek	1540	58
28	Do	106	61 do	pekoe	3050	48
29	Do	108	1 do	congou	60	40
30	Do	110	2 do	dust	160	30
31	W T	112	10 do	bro pek	500	51
32	Do	114	18 do	pekoe	900	44
33	Sembawtte	116	9 do 7 ch	pek fan	1380	37
34	Yataderia	118	24 do	bro pek	2640	52
35	Do	120	60 do	pekoe	6000	43
36	Do	122	45 do	pek sou	4050	42
37	Do	124	20 do	bro tea	1800	38
38	Thornfield	126	29 hf-ch	bro pek	1740	66
39	Do	128	29 ch	pekoe	2900	50
40	Do	130	9 do	pek sou	900	46
41	Do	132	2 hf-ch	pek dust	160	33
42	Mary Land	134	7 ch	bro or pek	665	50
43	Do	136	6 do	or pek	480	44
44	Do	138	13 do	pek sou	975	42
45	Do	140	1 hf-ch	dust	65	31
46	Chesterford	142	26 do	bro pek	1560	53
47	Do	144	28 do	pekoe	1400	43
48	Do	146	19 do	pek sou	950	41
49	Chalmers	148	11 do	bro pek	770	54
50	Do	150	32 do	pekoe	1920	49
51	Do	152	15 do	pek sou	900	45
52	Do	154	3 do	pek fans	270	37
53	Do	156	3 do	bro mix	225	39
54	Blairgowrie	158	26 do	bro pek	1300	55
55	Do	160	13 ch	pekoe	1235	46
56	Do	162	12 do	pek sou	1140	42
57	Do	164	1 hf-ch	bro tea	47	30
58	Do	166	2 do	dust	160	31
59	Radella	168	34 ch	bro pek	3400	52
60	Do	170	34 do	pekoe	2720	46
61	Do	172	37 do	pek sou	2960	43
62	Midlothian	174	20 hf-ch	bro pek	1000	55
63	Do	176	22 ch	pekoe	2420	45
64	Do	178	4 hf-ch	congou	200	41
65	Fetteresso	180	2 ch	sou	180	39
66	Do	182	1 do	dust	155	31
67	A D	184	14 hf-ch	red leaf	714	} 53
68	Do	186	1 do	red leaf	43	
69	Doonevale	188	9 ch	bro pek	900	52
70	Do	190	11 do	pekoe	990	42
71	Alnoor	192	29 hf-ch	bro pek	1450	51
72	Do	194	33 do	pekoe	1650	44
73	Do	196	4 do	pek sou	200	40
74	Do	198	2 do	dust	136	32
75	B A	200	8 ch 24 hf-ch	pekoe	1953	43
76	Shrub's Hill	202	49 ch	bro pek	4900	51
77	Do	204	49 do	pekoe	4165	44 bid
78	Do	206	48 do	pek sou	3840	42
79	Kelaneiya	208	39 do	bro pek	3315	57
80	Do	210	55 do	pekoe	4400	47
81	Do	212	3 do	congou	270	38
82	Do	214	2 do	dust	230	31
83	Portmore	216	52 do	bro pek	5720	54 bid
84	P	218	2 do	fans	182	32
85	Patiagama	220	16 do	bro pek	1760	52
86	Do	222	32 do	pekoe	3200	41 bid
87	Do	224	2 do	dust	300	33
88	Craighead	226	30 hf-ch	bro or pek	1500	52
89	Do	228	19 ch	pekoe	1710	44 bid
90	Do	230	19 do	pek sou	1700	42
91	Do	232	6 do	sou	510	40
92	Bismarck	234	2 do	dust	240	31
93	Amblakande	236	10 do	bro or pek	1000	53
94	Do	238	17 do	pekoe	1530	44
95	Do	240	4 do	sou	360	40
96	Do	242	1 do	bro tea	120	40
97	Harrington	244	2 hf-ch	dust	170	31
98	Do	246	2 do	unas	120	41
99	Do	248	1 ch	sou	90	37
100	G K	250	2 hf-ch	bro pek	92	46
101	I G	252	3 do	pekoe	153	44
102	St. Martin's	254	9 do	bro pek	394	50
103	Do	256	20 do	pekoe	900	42
104	Do	258	2 do	sou	80	36
105	Marguerita	260	24 do	bro pek	1440	58
106	Do	262	16 do	pekoe	800	49
107	Do	264	39 do	pek sou	2145	45
108	Do	266	3 do	dust	225	34
109	Do	268	1 do	sou	45	38
110	Aigburth	270	26 ch	bro pek	2600	52
111	Do	272	12 do	pekoe	1200	44 bid
112	Do	274	12 do	pek sou	1200	43
113	Bandara-polla	276	32 hf-ch	bro pek	1600	52 bid
114	Do	278	30 do	pekoe	1500	44 bid
115	Do	280	24 do	pek sou	1080	43
116	Do	282	21 do	bro pek	1050	51
117	Do	284	26 do	pekoe	1300	43
118	Do	286	18 do	pek sou	810	43
119	Do	288	2 do	sou	90	37
120	Moraloya	290	23 do	bro or pek	1265	51
121	Do	292	30 do	pekoe	1500	44
122	Do	294	28 do	pek sou	1260	43
123	Do	296	2 do	bro or pek fans	100	37
124	Do	298	2 do	pek dust	160	32

Messrs. E. BENHAM & Co. put up for sale at the Chamber of Commerce Sale-room on the 22nd April, the undermentioned lots of Tea (2,478 lb.) which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	H H	14	2 ch	bro mix	260	34
2	C S K, in estate mark	16	2 do	dust	200	33
3	Do	18	2 do	fans	200	36
4	L F	20	10 do	sou	770	38 bid
5	C L G	22	5 do	pek dust	850	26
6	Do	24	2 do	bro mix	198	32

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room on the 22nd April, the undermentioned lots of Tea (69,695 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
1	Ythanside	139	2 hf-ch	red leaf	160	30
2	Gouravilla	140	6 ch	pek sou	600	43
3	Do	142	18 do	sou	1800	38
4	Bittacy	144	31 hf-ch	bro pek	1860	55
5	Do	146	45 do	pekoe	2700	47 bid
6	B, in estate mark	148	4 do	congou	240	42
7	Do	149	3 do	dust	270	32

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
8	Anchor, in estate mark	150	15 ch	bro pek	1725	59
9	Do	152	34 do	pekoe	3400	44 bid
10	Do	154	22 do	pek sou	2200	48 bid
11	Do	156	12 do	bro mix	1500	32
12	Do	158	13 hf-ch	dust	975	32
13	Do	160	4 ch	bro tea	480	34
14	Beaumont	163	22 do	bro pek	2112	54
15	Do	162	29 do	pekoe	2610	42 bid
16	Mocha	165	25 hf-ch	bro pek	1280	78
17	Do	167	11 do	bro pek No. 2	770	43
18	Do	169	32 ch	pekoe	3200	50
19	Do	171	18 hf-ch	pekoe	810	69
20	Do	173	21 ch	pek sou	1890	43
21	Do	175	7 do	sou	630	43
22	Do	177	14 hf-ch	dust	1330	31
23	Do	179	5 ch	bro tea	600	34
24	J T	180	24 (5 lb.) box	pekoe	120	48
25	Kandenewera	181	18 ch	pek sou	1980	43
26	Tangapoo Tottum	183	18 do	bro pek	2100	53
27	Do	185	9 do	pekoe	1080	45
28	Do	187	15 do	pek sou	1680	43
29	Do	189	4 do	congou	448	37
30	Westhall	190	14 do	fans	1400	37
32	Galkandewatte	194	38 do	bro pek	3800	56 bid
33	Do	196	71 do	pekoe	6390	47 bid
34	G K W	198	1 do	bro tea	90	35
35	Brownlow	199	18 do	bro pek	1980	57
36	Do	201	19 do	pekoe	1900	47 bid
37	Do	203	13 do	pek sou	1235	44 bid
38	Do	205	1 do	sou	130	33
39	Kandenewera	206	26 do	bro pek	2340	51
40	Do	208	22 do	pek sou	2420	43 bid
41	B T	210	28 do	bro mix	2520	35 bid

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room on the 22nd April, the undermentioned lots of Tea (73,716 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	A K A C, in estate mark	1	3 hf-ch	fans	168	36
2	Do	2	2 do	dust	153	32
3	Do	3	10 do	sou	500	41
4	Do	5	59 do	pekoe	2950	46
5	Do	7	15 do	bro pek	750	55
6	Ivanhoe	9	12 do	bro pek	600	53 bid
7	Do	11	12 ch	pekoe	1080	45
8	Glanrhos	13	21 hf-ch	bro pek	1155	55
9	Do	15	21 do	pekoe	1575	46
10	Do	17	29 do	pek sou	2175	43
11	Torriogton	19	35 ch	bro or pek	3850	57 bid
			34 do	do	3740	" "
12	Do	21	37 do	bro pek	4070	51
			37 do	do	4070	"
13	Do	23	67 do	pekoe	6700	45 bid
			66 do	do	6600	" "
14	Do	25	35 do	pek sou	3500	41 bid
			34 do	do	3400	" "
15	Do	27	23 hf-ch	dust	1840	33
16	Kelani	28	12 do	bro or pek	680	57
17	Do	30	38 do	bro pek	2090	51
18	Do	32	45 ch	pekoe	4050	46
19	Do	34	51 hf-ch	pek sou	2295	43
20	Do	36	1 do	dust	75	31
21	Bogahagodawatte	37	4 do	bro pek	216	51
22	Do	38	5 do	pekoe	260	41
23	Do	39	5 do	pek sou	250	41
24	Do	40	4 do	bro mix	280	41
25	Do	41	2 do	fans	130	39
26	Do	42	1 ch	dust	90	30
27	Pnrhos	43	15 hf-ch	bro pek	900	63
28	Do	45	33 do	pekoe	1980	52
29	Do	47	27 do	pek sou	1350	45
30	G H K, in estate mark Ceylon	49	14 do	or pek	690	54
31	Do	51	11 ch	pekoe	1045	45
32	Ossington	53	12 hf-ch	bro pek	600	50
33	Do	55	10 do	pekoe	500	43
34	Do	57	14 do	pek sou	691	43
35	Do	59	1 do	red leaf	50	30
36	Do	60	2 do	dust	155	30
37	D	61	1 ch	red leaf	95	26
38	Glanrhos	62	4 do, 6 hf-ch	bro pek	770	53
39	Do	64	6 ch, 11 hf-ch	pekoe	1120	46
40	Do	66	11 ch, 8 hf-ch	pek sou	1330	43
41	Do	68	1 ch, 1 hf-ch	dust	230	32
42	Patulpana	69	8 do	bro pek	400	50
43	Do	71	1 do	pekoe	50	32
44	Do	72	10 do	pek sou	500	41
45	Do	74	1 do	bro pek dust	63	32
46	Glanrhos	75	1 ch	congou	105	35
47	Agars Laod	76	27 hf-ch	sou No 2	1215	38
48	Do	78	6 do	sou	270	41
49	Do	80	2 do	red leaf	90	30
50	N	81	2 do	dust	150	32

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room on the 22nd April, the undermentioned lots of Tea (91,656 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	T N C	82	7 hf-ch	dust	665	33
2	A R	83	5 ch	bro mix	500	32
3	Do	84	15 hf-ch	dust	1200	32
7	Lyndhurst	88	15 ch	pek sou	1425	40
8	Do	89	6 do	dust	720	33
9	Do	90	6 do	red leaf	558	33
10	Morningside	19	43 hf-ch	bro pek	1045	52
11	Do	92	43 do	pekoe	2365	44
12	Do	93	2 do	pek sou	110	37
13	Do	94	2 do	bro mix	110	28
14	Do	95	2 do	dust	150	31
18	Roseneath	99	21 hf-ch	bro pek	1470	53
19	Do	100	14 ch	pekoe	1540	46
20	Do	1	17 do	pek sou	1870	43
25	D R A	6	34 ch	bro pek	3400	53
26	Do	7	34 do	pekoe	2700	46
27	Do	8	11 do	pek sou	1210	43
28	Forest Hill	9	14 do	bro pek	1540	56
29	Do	10	19 do	pekoe	1900	47
30	Do	11	11 do	pek sou	1045	43
31	Do	12	2 do	dust	260	33
32	Do	13	1 do	congou	100	34
33	E C	14	3 do, 1 hf-ch	pekoe	374	withd'n
34	Do	15	1 ch	congou	111	28
35	Do	16	8 do	dust	1229	25
36	Blairavon	17	16 do	bro pek	1600	56
37	Do	18	23 do	pekoe	2150	46
38	Do	19	16 do	pek sou	1360	43
39	Do	20	2 do	dust	240	33
40	Do	21	2 do	bro tea	180	33
41	W A H	22	11 do	pekoe	1100	46
42	Do	23	7 do	pek sou	700	42
43	Woodthorpe	24	22 hf-ch	unas	1210	45
49	Ederapolla	30	24 do	bro pek	1200	56
50	Do	31	14 ch	pekoe	1260	48
51	Do	32	20 do	pek sou	1800	44
52	Do	33	1 do	bro tea	90	38
53	Chertsey	34	25 do	or pek	2375	44 bid
54	Do	35	11 hf-ch	or pek	550	44 bid
55	Do	36	5 ch	pek sou	460	43
56	Do	37	6 hf-ch	sou	300	38
57	Do	38	17 do	bro mix	935	38
58	Do	39	3 do	pek fans	165	38
59	S P	40	3 do	bro pek	150	54
60	Do	41	6 do	pekoe	270	45
61	Do	42	8 do	pek sou	360	43
62	Do	43	1 do	congou	40	38
63	Do	44	1 do	red leaf	40	32
64	Do	45	1 do	dust	70	33
65	Yelebende	46	13 ch	bro pek	1365	58
66	Do	47	13 do	pekoe	1235	48
67	Do	48	17 do	pek sou	1530	46
68	G B	49	19 ch	dust	2470	32
69	D B G	50	3 do	bro mix	315	34 bid
70	Do	51	2 do	fans	220	36 bid
71	Do	52	3 hf-ch	dust	240	32
82	Pallai	63	38 do	pek fans No. 1	1520	26 bid
83	Do	64	19 do	pek fans	760	out
84	Do	85	21 do	pek fans	840	out
85	Do	66	3 do	dust	210	22 bid
86	R B	67	8 do	bro pek	448	52
87	K V	68	10 ch	pek sou	1000	38

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
88	N B	69	1 hf-ch	pek fans	52	35
89	Do	70	12 do			
			2 ch	bro mix	825	33
90	S P B, in estate mark	71	2 hf-ch	pek sou	110	38

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room on the 22nd April, the undermentioned lots of Tea (136,640 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	K H L	300	2 ch	unas	160	45
2	Do	302	1 do	dust	100	32
3	Do	304	1 do	bro mix	90	36
4	Do	306	1 hf-ch	do	54	36
5	Deniyaya	308	3 ch	bro pek	300	51
6	Do	310	4 do	pekoe	400	45
7	Do	312	2 do	pek sou	200	42
8	Do	314	1 do	sou	100	39
9	D C	316	3 do	bro pek	300	52
10	Do	318	4 do	pekoe	400	43
11	Do	320	7 do	pek sou	700	41
12	Do	322	1 do	red leaf	100	27
13	Do	324	1 hf-ch	congou	50	30
14	Beau Sijour	326	4 ch	bro pek	400	53
15	Do	328	10 do	pekoe	900	44
16	Do	330	2 do	pek sou	200	40
17	Do	332	1 hf-ch	dust	70	33
18	M O	334	17 do	bro pek	1700	50
19	Do	336	12 ch	pekoe	1092	41 bid
20	Do	338	18 do	pek sou	1638	35 bid
21	Do	340	2 do	dust	256	33
22	Do	342	1 do	congou	90	33
23	Becherton	344	24 hf-ch	bro pek	1200	57
24	Do	346	24 ch	pekoe	2400	45
25	O H O	348	9 hf-ch	bro or pek	540	52
26	Do	350	6 ch	pekoe	570	44
27	Do	352	10 do	pek sou	1000	42
28	Harangalla	354	25 do	bro pek	2500	52
29	Do	356	39 do	pekoe	3510	44 bid
30	B T N	358	1 do	sou	99	37
31	Do	360	1 do	dust	123	32
32	L, in estate mark	362	1 hf-ch	pek sou	35	38
33	H & H	364	3 ch	bro mix	285	36
34	Court Lodge	366	27 hf-ch	bro pek	1512	75
35	Do	368	36 do	pekoe	1656	57 bid
36	Do	370	32 do	pek sou	1035	53
37	Do	372	2 ch	sou	168	47
38	Do	374	3 do	dust	435	34
39	Mousakande	376	12 do	bro pek	1200	56
40	Do	378	11 do	pekoe	1100	46
41	Do	380	7 do	pek sou	665	45
42	Do	382	1 do	dust	130	34
43	B & D	384	2 do	red leaf	240	28
44	Ukuwella	386	12 do	bro pek	1200	55
45	Do	388	12 do	pekoe	1200	42
46	Do	390	12 do	pek sou	1140	41
47	Do	392	1 do	congou	100	39
48	Do	394	1 hf-ch	dust	75	33
49	Farnham	396	18 do	bro or pek	900	63
50	Do	398	20 ch	pekoe	1800	51
51	Do	400	33 hf-ch	pek sou	1485	48
52	Iddegodde	402	1 ch	sou	61	38
53	Do	404	1 do	dust	90	32
54	A S	406	3 hf-ch	bro pek	119	44
55	Do	408	1 do			
			1 box	bro tea	45	30
56	H D	410	2 ch	pekoe No. 2	195	32
57	Do	412	2 do	pek sou	200	32
58	Glengariffe	414	3 do	bro tea	315	41
59	Do	416	3 do	dust	300	31
60	Easdale	418	20 do	bro pek	2000	55
61	P T, in estate mark	420	7 do			
			1 hf-ch	pekoe	651	37
62	Do	422	2 ch	fans	286	31
63	Galakadua	424	6 hf-ch	bro pek	300	52
64	Do	426	9 do	pekoe	450	45
65	Do	428	7 do	pek sou	350	42
66	Do	430	1 do	bro tea	63	29
67	F B	432	18 ch	bro tea	1836	35
68	Columbia	434	22 hf-ch	bro pek	1320	75
69	Do	436	23 do	pekoe	1150	61
70	Do	438	4 do	pek sou	180	46
71	Do	440	2 do	dust	140	33
72	Glenorchy	442	40 do	bro pek	2200	65
73	Do	444	41 do	pekoe	2050	53
74	Do	446	7 do	pek sou	350	45

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
75	Maskeliya	448	10 ch	pekoe	1000	45 bid
76	Lankapura W	450	12 do	bro pek	1200	58 bid
77	Do	452	30 do	pekoe	2850	48 bid
78	Do	454	30 do	pek sou	2700	45 bid
79	Yataderia	456	17 do	bro pek	1870	53
80	Do	458	67 do	pekoe	6700	45
81	Do	460	26 do	pek sou	2340	43
82	Do	462	10 do	bro tea	900	37
83	Panmure	464	17 do	bro pek	1870	57
84	Do	466	25 do	pekoe	2625	48
85	Do	468	16 do	pek sou	1600	45
86	Do	470	1 do	bro mix	135	33
87	Do	472	1 do	pek dust	150	30
88	Do	474	7 do	bro pek	770	56
89	Do	476	11 do	pekoe	1155	49
90	Do	478	7 do	pek sou	700	44
91	Do	480	1 do	bro mix	120	31
92	Do	482	1 do	pek dust	100	32
93	Mourovia	484	7 do			
			5 hf-ch	bro pek	950	53
94	Do	486	17 ch			
			3 hf-ch	pekoe	1850	44
95	Do	488	4 ch			
			6 hf ch	pek sou	708	43
96	Do	490	2 do	bro mix	100	38
97	Do	492	1 ch			
			1 hf-ch	dust	205	32
98	E K	494	1 ch	bro pek	100	51
99	Do	496	3 hf-ch	pekoe	150	44
100	Do	498	2 do	pek sou	100	42
101	Halpa-tenne	500	4 ch	bro pek	400	51
102	Do	502	5 do	pekoe	500	44
103	Do	504	12 do	pek sou	1140	42
104	Do	506	1 do	pek fan	116	34
105	New Pera-deniya	508	13 do	sou	1105	38
106	Do	510	11 do	dust	1210	32
107	Shrub's Hill	512	8 do	unas	520	37
111	Donside	520	4 ch	sou	340	40
112	Do	522	1 hf-ch	dust	70	31
113	Bowlana	524	13 ch	bro pek	1430	54
114	Do	526	19 do	pekoe	1900	46
115	Do	528	14 do	pek sou	1330	44
116	J R H	530	2 do			
			1 hf-ch	bro pek	270	52
117	Do	532	4 ch	pekoe	400	44
118	Do	534	2 do			
			1 hf-ch	pek sou	235	43
119	Do	536	1 do	dust	70	31
120	Theydon Bois	538	15 do	bro or pek	1500	53
121	Do	540	16 ch	pekoe	1440	45
122	Do	542	5 do	sou	425	41
123	Queens-land	544	6 do	pek fans	450	37
124	Kahagalla	546	10 do	bro pek	1100	53
125	Do	548	16 do	pekoe	1600	45
126	Do	550	1 do	congou	100	41
127	Palmers-ton	552	7 hf-ch	bro pek	420	60
128	Do	554	14 ch	pekoe	1400	49
129	Do	556	8 do	pek sou	800	45
130	West Hapu-tale	558	8 hf-ch	pek sou	400	44
131	N M	560	32 do	pekoe	1632	42
132	Nahaveena	562	56 do	bro pek	2800	55
133	Do	564	26 do	pekoe	1170	47
134	Do	566	49 do	pek sou	2450	45
135	Do	568	4 do	dust	260	34
136	Bandara-polla	570	34 do	bro pek	1700	50
137	Do	572	25 do	pekoe	1250	44
138	Do	574	26 do	pek sou	1170	43
139	Do	576	3 do	sou	135	33
140	Do	578	20 do	pekoe	1000	44
141	Pattiagalla	580	5 do	bro pek	250	64
142	Do	582	9 do	pekoe	405	46
143	Do	584	16 do	pek sou	720	43
144	Do	586	2 do	bro mix	110	38
145	Ferndale	588	7 ch	bro pek	700	58
146	Do	590	15 do	pekoe	1500	47
147	Do	592	3 do	pek sou	300	42
148	Do	594	1 do	pek dust	100	30
149	Do	596	2 do	dust	200	30
150	Polatagama	598	46 hf-ch	bro pek	2760	61
151	Do	600	99 do	pekoe	4800	50
152	Do	2	90 do	pek sou	4500	46

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, April 3rd, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 3rd April:—

Ex "Clan Graham"—Hallowelle, 1t 114s; 5c 110s; 3c 1b 110s; 5c 108s; 2c 105s; 2c 1b 136s; 1c 1t 101s 6d.

Ex "Manora"—Kirkoswald, Sheen, 2b 97s 6d. Gallella, 1b 4c 113s; 4c 1b 108s; 1b 104s; 1t 134s; 1t 102s; 1b 106s.

Ex "Navarino"—Ambawella, 5c 107s; 2c 106s 6d.

Ex "Scindia"—Uva Estate, 1c 107s; 1c 1t 105s; 1b 104s; 1b 112s; 1t 109s 6d.

Ex "Orion"—Berragalla, 4c 112s; 11c 1b 107s 6d; 1c 1t 104s 6d; 2c 129s 6d; 3c 1t 100s 6d; 4b 105s 6d. Gonatmoava, 1c 113s; 5c 1t 109s; 2c 1b 106s; 1c 128s; 1c 1b 101s 6d; 2b 105s 6d; 2b 101s; 1b 96s; 1c 97s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 10th April:—

Ex "Ping Suey"—Mceriabedde, 1c 110s; 3c 1t 107s 1c 104s; 1c 136s. Ragalla, 1b 106s; 2c 104s 6d; 1c 103s 6d; 1t 123s. Beauvais, 1t 110s; 2c 1t 107s; 1b 103s; 1b 125s.

Ex "Clan Buchanan"—Dunsinane, 1b 2c 113s; 3c 1b 109s; 1b 104s; 1t 136s; 1c 101s 6d.

Ex "City of London"—Delmar, 1b 109s; 1b 106s; 2c 106s 6d; 1b 103s 6d; 1b 117s; 1c 1t 99s 6d.

Ex "Scindia"—Craigie Lea, 1t 110s 6d; 1c 1t 109s; 2c 1b 108s; 1b 103s 6d; 1c 126s; 1t 100s 6d; 2b 100s 6d; 1b 104s 6d. Darrawelle, 1b 109s; 1c 109s; 2c 1b 109s; 1b 103s 6d; 1t 125s; 1t 99s; 2b 103s 6d; 1b 105s.

Ex "Ping Suey,—Delrey, 1b 116s; 3c 115s; 4c 111s 6d; 1b 104; 1c 141s; 1b 101s; 1b 113s.

Ex "Orion"—Elgin, 1c 1b 115s; 4c 111s 6d; 1c 107s; 1c 1b 138s 6d; 1t 102s 6d; 1b 111s. Logie, 3c 1b 113s 6d; 5c 109s; 3c 1b 103s 6d; 1c 1b 104 6d; 2c 1t 139s; 1c 101s 6d; 4b 108s. Sarnia, 2c 1t 111s 6d; 4c 1t 106s 6d; 2c 103s 6d; 1c 1b 135s; 1c 1b 98s; 13b 87s 6d; 3b 95s 2b 103s.

Ex "Goorkha"—Agra, 1c 111s; 3c 109s; 1t 1b 104s 6d; 1b 120s; 1t 91s,

Ex "Scindia"—North Matale, 1c 107s; 1c 103s 6d; 1b 110s; 1c 1t 99s.

Ex "Ping Suey"—Keenakelle, 1t 113s; 2c 1t 111s; 5c 106s 6d; 1c 104s; 1c 134s; 1t 105s; 1c 103s; 1b 100s; 1b 115s; 1b 117s; 2c 109s; 1b 103s 6d; 1c 138s. Ormiston, 1b 109s; 1c 1t 105s; 2c 1b 104s 6d; 1b 103s; 1t 110s. Kirkoswald, 1b 112s; 2c 108s; 4c 1t 105s; 1b 103s 6d. 1c 1t 121s 6d. Kalupahania, 1c 112s; 3c 110s; 5c 105s; 1b 103s; 1c 129s.

Ex "Manora"—Eton, 3c 1b 111s 6d; 5c 108s; 3c 1b 108s; 1t 105s 6d; 1c 1b 137s 6d; 1t 111s; 2c 107s 6d; 1b 104s 6d; 1b 129s.

Ex "Ping Suey"—Meddecombra, 4c 116s 6d; 4c 1b 1 10s 6d; 2c 105s 6d; 1c 138s.

Ex "Manora"—Lynford, 1c 1t 110s 6d; 4c 1b 107s 6d 1c 1b 105s; 1c 1b 126s.

Ex "Ping Suey"—Deyanella, 1b 109s; 2c 1t 108s; 1c 103s; 1b 100s; 1b 118s.

Ex "Scindia"—Kelburne, 2c 1b 110s; 6c 106s 6d; 1c 1b 101s 6d; 1b 112s; 1t 1b 111s 6d. Middleton, 1b 110s; 3c 1t 113s. 3c 1t 107s; 1c 1b 105s 6d. 1c 1t 129s; 1b 109s; 2c 108s; 1t 106s; 2c 105s; 1t 101s; 1t 125s.

Ex "Clan Buchanan"—Middleton, 1c 1b 112s; 1c 106s 6d; 1b 103s; 1b 130s. Wariagalla, 1b 1c 106s 6d; 1c 1t 104s 6d; 1b 102s 6d; 1b 118s. Dimboola, 2t 112s 6d; 2c 1b 1t 111s; 1t 105s 6d; 1c 136s.

Ex "City of London"—Gomalie, 1t 106s; 1b 102s; 1b 100s; 1b 112s.

Ex "Goorkha"—Oocagalla, 1c 108s; 1c 1b 105s; 1c 101s; 1c 121s; 1b 96s 6d. Ragalla, 1c 103s; 1c 102s; 1b 114s; 4b 96s 6d.

Ex "Ping Suey"—RGT, 7b 96s 6d. Newton, 2c 1b 110s; 5c 1b 108s; 1c 104s; 1t 136s; 1c 133s; 1c 101s; 2b 105s; 1b 92s. Pittaratmalle, 1b 113s; 2c 110s; 5c 107s; 3c 1b 106s 6d; 1b 2c 103s; 1b 133s; 1c 131s; 1c 99s; 4 bags 104s. Elbedde, 1b 115s; 3c 117s 6d; 3c 110s 6d; 1b 104s; 1c 142s; 1b 99s.

Ex "Manora"—Fassifern West, 1t 103s; 1c 122s; 1b 99s 6d.

Ex "City of London"—Choisy, 1b 109s; 1c 107s; 1c 105s 6d; 1b 102s; 1b 95s; 1 bag 80s.

Ex "Goorkha"—Hunipha, 1t 109s; 1c 106s; 1b 100s. Ooneygar, 1c 1t 101s 6d; 1b 97s.

CEYLON CINCHONA SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, March 26th, 1891.

Mark	Natural Stem	Renewed	Root
Gallcola	1¾d	...	...
W S B, R in dia.	1¼d to 1½d	...	...
Verelapatna	1½d to 1¾d	2½d to 3d	...
Choisy, Hybrid	1½d	...	2d
ROP	2d	3d	2d
Gangawatte	2d	2½d	2d
WSF, D in diamond	2d	2½d	...
Loinorn	3d to 3½d	...	...
Dunsinane, Hyd.	2d to 2½d	4d to 4½d	...
Mahapahagalla	1½d to 1¾d	2d to 2½d	...
Sherwood	2½d	3d	...
Kahagalla	1½d to 1¾d	...	...
OFFICINALIS.			
St. Leonards	3d	7d	4½d
Lemagastenne, Ledger	5¾d to 6d	...	...
Yarrow, Ledger	6d	...	...
Thornfield	...	4½d	...
Bismark	1¾d to 2d	...	...
M C C Co. in dia.	2½d to 3d	..	4d
Do Hybrid	1¾d to 4d	...	...
St. Johns	...	...	4½d to 5d

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, April 3rd, 1891.

Ex "Myrmidon"—Wanagalla, 2 cases 2s 3d.
Ex "Laertes"—Gallantenne, 2 cases 3s 7d; 4 1s 9d.
Ex "Manora"—Amblamana, 1 case 3s 11d; 2 3s 7d; 1 2s; 3 1s 5d.
Ex "Cuzco"—Wattagalla, 2 cases 3s 6d; 5 3s 7d; 3 2s 2d; 5 1s 7d; 1 1s 5d; 1 1s 10d.
Ex "Laertes"—Delpotonoya, 1 case 2s 8d; 1 2s 7d; 3 2s 6d; 2 1s 9d; 3 1s 8d; 1 1s 5d.
Ex "Polyphemus"—Wariagalla, 2 cases 2s 1d; 2 2s 2d; 5 2s 4d; 2 1s 6d; 5 1s 7d; 2 1s 4d; 4 1s 5d.
Ex "Arcadia"—Wariagalla, 3 cases 1s 4d; 1 1s 8d.

"CEYLON OBSERVER" PRESS, COLOMBO.

No. 13.] COLOMBO, MAY 13, 1891. { PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Mr. E. JOHN put up for sale at the Chamber of Commerce Sale-room on the 29th April, the undermentioned lots of Tea (83,925 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	D E	212	6	ch	bro mix	570	38
2	Do	213	8	do	fans	680	37
3	Maria	214	18	do	pek sou	1800	43
4	Ivies	216	12	do	bro pek	1200	55
5	Do	218	19	do	pekoe	1710	44
6	Do	220	13	do	pek sou	1170	42
7	Do	222	2	do	bro tea	140	36
8	Do	223	1	do	dust	75	33
9	F T	224	33	do	bro pek	3300	49 bid
10	Do	225	14	do	pekoe	1400	43 bid
11	Do	228	18	do	pek sou	1800	41 bid
12	Do	230	4	do	bro tea	400	37
13	Ottery	232	13	do	bro pek	1300	60 bid
14	Do	234	17	do	pekoe	1530	48 bid
15	Do	235	5	do	bro mix	600	40 bid
16	Stamford Hill	237	13	do	bro pek	1300	60 bid
17	Do	239	17	do	pekoe	1530	50 bid
18	Do	241	4	do	bro mix	480	43
19	Dunbar	242	23	do	bro pek	2300	52 bid
20	Do	244	24	do	pekoe	2160	41 bid
21	Do	246	6	do	sou	510	41
22	Do	248	2	do	dust	240	31
23	Tientsin	249	15	do	bro pek	900	62
24	Do	251	25	do	pek sou	2250	45
25	Great Valley	253	17	do	bro pek	1870	51
26	Do	255	25	do	pekoe	2500	43 bid
27	Do	257	15	do	pek sou	1425	40 bid
28	Lawrence Factory	259	52	do	sou	4940	33 bid
29	Albion	261	23	do	bro pek	2530	62
30	Do	263	24	do	pekoe	2400	50
31	Do	265	26	do	pek sou	2600	45
32	Do	267	4	do	dust	320	35
33	Brownlow	268	19	do	pekoe	1900	46 bid
34	Blackburn	270	41	box	bro pek	820	54 bid
35	Do	272	21	ch	pekoe	2355	43
36	Do	274	2	do	pek sou	200	39
37	Do	275	1	do	dust	135	32
38	Agra Ouvah	276	90	box	bro or pek	900	60 bid
39	Do	278	22	hf-ch	or pek	990	55 bid
40	Do	280	20	do	do	900	50 bid
41	Do	282	22	do	pekoe	990	45 bid
42	Do	284	20	do	do	900	45 bid
43	Do	286	18	do	pek sou	810	39 bid
44	Do	288	20	do	do	900	40 bid
45	Fankerton	290	20	do	pek fan	900	31 bid
46	B T	11	29	ch	bro mix	2610	34
50	Kandenewera	19	18	do	pek sou	1980	41 bid
51	Keenagodde	21	4	hf-ch	bro pek	240	50
52	Do	22	4	ch	pekoe	410	42
53	Do	24	2	do	pek sou	220	39 bid
54	Logan	26	40	hf-ch	bro pek	2000	52 bid
55	Do	28	33	do	pekoe	1485	46 bid
56	Do	30	60	do	pek sou	2700	42
57	Do	32	14	do	sou	700	39
58	o	34	11	do	dust	660	34

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room on the 29th April, the undermentioned lots of Tea (58,315 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	Ivanhoe	1	4	hf-ch	dust	320	29
2	Do	2	3	ch	fans	330	36
3	Do	3	14	do	pek sou	1274	38 bid
4	Do	5	16	do	pekoe No. 2	1456	41 bid
5	Do	7	23	do	pekoe No. 1	2300	43 bid
6	Do	9	26	hf-ch	bro pek	1300	55 bid
7	Relugas	11	35	do	bro pek	1925	46 bid
8	Do	13	25	ch	pekoe	2750	42 bid
9	Do	15	40	do	pek sou	4000	39 bid
10	Do	17	2	do	dust	236	28
11	Do	18	1	do	red leaf	88	24
12	D G A O, in estate mark	19	45	box	bro pek	900	55 bid
			(Not exceeding 28 lb. gross.)				
13	Do	21	29	ch	bro pek	2900	50 bid
14	Do	23	42	do	pekoe	4200	43 bid
15	Do	25	45	do	pek sou	4500	41 bid
16	Hakurugalla	27	15	do	bro pek	1500	50 bid
17	Do	29	18	do	pekoe	1620	43 bid
18	Do	31	15	do	pek sou	1350	41
19	Do	33	1	do	pek du	150	32
20	Do	34	2	do	bro te	200	30
21	P B	35	5	do	dust	750	26
22	Do	36	1	do	red leaf	90	20
23	Dikmukalana	37	4	hf-ch	fans	200	33
24	Do	38	4	do	dust	200	32
25	K	39	6	do	sou	300	42
26	K	41	8	do	dust	560	34
33	M F	51	21	ch	bro mix	1575	31 bid
34	Woodend	53	11	do	bro pek	1100	49 bid
35	Do	55	16	do	pekoe	1520	41 bid
36	Do	57	4	do	pek sou	340	35 bid
37	Do	58	1	do	dust	120	31
38	Merton	59	12	do	bro pe	1200	51 bid
39	Do	61	20	do	pekoe	1600	42 bid
40	Do	63	15	do	sou	1200	38 bid
41	Do	65	2	do	dust	250	31
42	A C W	67	21	do	pek fans	2900	32 bid
43	Ettapolla	69	20	hf-ch	bro pek	1100	59 bid
44	Do	71	33	do	pekoe	1815	41 bid
45	P O	73	3	do	bro pek	168	55
46	Do	74	3	do	pekoe	155	46
47	Do	75	12	do	pek sou	656	43
48	Do	77	1	do	congou	51	33
49	Do	78	2	do	unas	83	40
50	Do	79	1	do	dust	65	33

Messrs. SOMERVILLE & Co. put up for sale at the Chamber of Commerce Sale-room on the 29th April, the undermentioned lots of Tea (91,347 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.		Description	Weight lb.	c.
1	Heatherton	72	1	ch	pek sou	90	45
2	Do	73	2	hf-ch	dust	172	30
3	Hatdowa	74	4	ch	bro pek	400	49
4	Do	75	1	do	red lef	100	33
5	Do	76	1	do	congou	100	33
6	Do	77	14	do	bro tea	1400	39
7	Wereagalla	78	30	do	bro pek	3000	54 bid
8	Do	79	37	do	pekoe	3330	46
9	Do	80	22	do	pek sou	1870	42
10	Do	81	14	do	pek sou	1120	43
11	Do	82	1	hf-ch	dust	75	31
12	Malgolla	83	20	do	bro pek	1100	48 bid
13	Do	84	23	do	pekoe	1150	45
14	Do	85	17	do	pek sou	765	42
15	Depedene	86	20	do	bro pek	1000	56
16	Do	87	42	do	pekoe	2100	47
17	Do	88	56	do	pek sou	2800	43
18	H D	89	103	do	bro tea	5150	39 bid
19	Do	90	6	do	bro mix	300	33
20	Do	91	7	do	dust	560	31
21	Wewesse	92	44	do	bro pek	2200	57 bid
22	Do	93	62	do	pekoe	3100	47
23	Do	94	17	do	pek sou	850	44
24	Do	95	1	do	sou	50	38
25	Do	96	4	do	dust	320	33
26	Galkoluwa	97	1	do	bro pek	60	50
27	Do	98	1	do	pekoe	54	42
28	Depedene	99	3	do	bro pek	150	55
29	Do	100	8	do	pekoe	400	45
30	Do	1	12	do	pek sou	600	43
31	H D	2	17	do	bro tea	850	33 bid
32	E A T S, in estate mark	3	5	ch	bro pek	550	54 bid
33	Do	4	6	do	pekoe	570	46 bid
34	Do	5	3	do	pek sou	285	41
35	Do	6	1	hf-ch	dust	45	31
36	St. Andrews	7	17	do	or pek	1123	66
37	Do	8	42	box	or pek	840	61
38	Do	9	19	hf-ch	bro pek	1235	45 bid
39	Do	10	39	do	pekoe	2496	44 bid
40	Kattukitula	11	1	do	bro pek	53	59
41	Do	12	2	do	pekoe	100	43
42	Do	13	6	do	pek sou	300	43

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
48	Malgolla	19	36	hf-ch	bro pek	1980	52
49	Do	20	40	do	pekoe	2000	45 bid
50	Do	21	53	do	pek sou	2385	43
51	Do	22	11	do	bro tea	660	40
52	Aadeven	23	18	ch	bro pek	1800	51 bid
53	Do	24	34	do	pekoe	3060	42 bid
54	K M O K	25	2	do	bro tea	180	39
55	Wewelmadde	26	4	hf-ch	dust	360	27
56	Vincit	27	1	do	bro tea	60	32
57	Do	28	1	do	dust	60	30
58	Do	29	1	ch	fans	100	29
59	Ovoca A I	30	17	do	bro pek	1955	65
60	Do	31	36	do	pekoe	3600	49 bid
61	Do	32	21	do	pek sou	2100	45 bid
62	Z Z Z	33	5	hf-ch	pek sou	200	37
63	Friedland	34	14	do	congou	840	37 bid
64	Crurie	35	22	ch	bro pek	2120	58 bid
65	Do	36	25	do	pekoe	2375	49
66	Do	37	35	do	bro sou	3325	43
67	Do	38	1	do	dust	130	30
68	Do	39	1	do	red leaf	85	27
69	S & M	40	3	hf-ch	bro pek	150	43
70	Do	41	13	do	pek sou	650	35
71	Do	42	1	ch	bro tea	90	33
72	South Wana Rajah	43	13	do	bro or pek	1300	73
73	Do	44	44	do	pekoe	4400	47 bid
74	Ingeria	45	4	hf-ch	bro pek	225	56
75	Do	46	11	do	pekoe	555	46
76	Do	47	6	do	peksou	300	42
77	Do	48	1	do	bro tea	65	34
78	Do	49	1	do	unas	55	42
79	Kuruwitte	50	5	do	bro pek	275	60
80	Do	51	4	do	pekoe	196	47
81	Do	52	14	do	pek sou	672	43
82	Do	53	4	do	sou	180	40
83	Do	54	5	do	bro tea	280	39
84	Do	55	1	do	congou	46	36
85	Do	56	1	do	dust	79	32
86	Pittawella	57	26	do	bro pek	1508	49 bid
87	Do	58	28	do	pekoe	1540	43 bid
88	Do	59	3	do	sou	174	38
89	M	60	5	ch	bro tea	630	33 bid
90	E W, in estate mark	61	3	hf-ch	bro tea	120	30
91	P	62	3	do	dust	210	22
92	R	63	1	do	bro tea	41	27
93	A B B	64	2	ch	pekoe	190	38 bid
94	W	65	1	do	sou	95	37
95	S P	66	6	hf-ch	pekoe	270	44 bid
96	Do	67	1	do	pek sou	39	36
97	F	68	1	ch	pek dust	99	30
98	K G H	69	4	hf-ch	bro pek	220	44
99	Do	70	3	do	pekoe	170	40
100	Do	71	5	do	peks sou	250	36
101	T, in estate mark	72	5	do	pekoe	250	37
102	P	73	2	ch	bro pekoe	140	50

Messrs. FORBES & WALKER put up for sale at the Chamber of Commerce Sale-room on the 29th April, the under mentioned lots of Tea (114,964 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
1	T C O	4	4	ch			
			1	hf-ch	red leaf	470	31
2	Horana	6	2	do	bro pek	100	54
3	Do	8	3	do	pekoe	131	44
4	Do	10	9	do	pek sou	395	43
5	Citrus	12	4	do	bro pek	240	55
6	Do	14	21	do	pekoe	1150	43
7	Do	16	11	do	pek sou	550	42
8	Digdolla B	18	1	ch	bro pek	100	47
9	Do	20	3	do	pekoe	300	36 bid
10	Do	22	7	do	pek sou	700	34
11	Digdolla	24	7	do	bro pek	700	49
12	Do	26	6	do	pekoe	600	41
13	Do	28	1	do	bro tea	100	26
14	Do	30	1	do	dust	127	29
15	Daphne	32	3	do	bro pek	300	47
16	Do	34	5	do	pekoe	500	39
17	Do	36	4	do	pek sou	400	37
18	Beau Sijour	38	5	do	bro pek	500	50
19	Do	40	18	do	pekoe	1620	42
20	Do	42	2	do	pek sou	200	38
21	Katugalla	44	14	do	bro pek	1510	52
22	Do	46	3	do	pekoe	300	41
23	Do	48	4	do	pek sou	400	38
24	Alton	50	4	ch	bro tea	360	41
25	A	52	5	hf-ch	bro tea	225	27
26	A	54	6	do	pekoe	300	41
27	Court Lodge	56	28	do	bro pek	1568	1
28	Do	58	25	do	pek sou	1125	53
32	Hardenhuish	66	9	ch	dust	720	27
33	Do	68	1	do	red leaf	80	24
34	Tonacombe	70	25	hf-ch	bro pek	1375	61
35	Do	72	52	do	pekoe	2600	48
36	Do	74	48	do	pek sou	2160	44
37	Do	76	12	do	sou	480	40
38	Do	78	2	do	dust	160	31
39	Do	80	2	do	fans	120	44
40	L G E	82	34	ch	or pek	3400	48 bid
41	Do	84	20	do	pekoe No. 1	2000	42 bid
42	Do	86	3	hf-ch	dust	255	31
43	Dehiowita	88	14	ch	bro pek	1470	51
44	Do	90	33	do	pekoe	3300	43 bid
45	Do	92	12	do	pek sou	1140	42
46	Do	94	1	do	bro tea	120	31
47	Do	96	1	do	dust	160	33
48	St. Catherine	98	7	do	bro pek	630	51
49	Do	100	7	do	pekoe	595	43
50	Do	102	6	do	pek sou	480	41
51	Do	104	2	do	pek fans	140	35
52	P A	106	10	do			
			1	hf-ch	pek sou	1025	38
53	Do	108	4	ch	fans	615	36
54	Arapolakanda	110	1	hf-ch	dust	68	31
55	C, in estate mark	112	8	ch	bro tea	800	30
56	Doombagastalawa	114	4	do	bro tea	504	33
57	Do	116	1	do	red leaf	100	31
58	Kirrimettia	118	1	do	dust	143	33
59	N	120	2	do	bro mix	178	25
61	S S S	124	4	do	red leaf	588	22
62	Do	126	8	do	congou	868	36
67	Pansalatenne	136	23	do	bro pek	2415	51 bid
68	Do	138	23	do	pekoe	2300	43 bid
69	Do	140	25	do	pek sou	2375	44 bid
70	Do	142	2	do	congou	200	39
71	Do	144	3	do	dust	225	33
72	Deaculla	146	22	hf-ch	or pek	1320	60
73	Do	148	24	ch	pekoe	2400	46 bid
74	Do	150	1	do	congou	100	39
75	Do	152	2	hf-ch	dust	141	31
76	Thebertou	154	22	ch	bro pek	2200	47
77	Do	156	12	do	pekoe	1200	41
78	Do	158	3	do	pk dust	300	31
79	Middleton	160	50	hf-ch	bro pek	3250	58
80	Do	162	14	ch	pekoe	1540	46 bid
81	Do	164	7	do	pek sou	784	43
82	Do	166	2	hf-ch	dust	188	32
83	Maryland	168	8	ch	bro or pek	800	51
84	Do	170	7	do	or pek	560	43
85	Do	172	16	do	pek sou	1280	42
86	Do	174	1	do	dust	85	32
87	Do	176	4	do	sou	320	37
88	Bandarapolla	178	30	hf-ch	bro pek	1500	50
89	Do	180	18	do	pekoe	900	41
90	Do	182	31	do	pek sou	1395	40
91	Do	184	3	do	sou	135	36
92	V O	186	4	ch	dust	474	32
93	Do	188	11	do	bro tea	1210	31
94	Gikiyanakauda	190	10	hf-ch	sou	500	41
95	M C	192	12	ch	pekoe	1092	37 bid
96	Do	194	18	do	pek sou	1638	38
97	Alncor	196	25	hf-ch	bro pek	1250	50
98	Do	198	25	do	pekoe	1250	42
99	Do	200	8	do	pek sou	400	40
100	Do	202	1	do	dust	80	33
101	Thornfield	204	26	do	bro pek	1560	16 bid
102	Do	206	27	ch	pekoe	2700	48 bid
103	Do	208	14	do	pek sou	1400	43 bid
104	Do	210	2	hf-ch	dust	160	35 bid
105	Hethersett	212	17	ch	bro pek	1785	60
106	Do	214	9	do	pekoe	810	48 bid
107	Do	216	8	do	pek sou	640	47 bid
108	Do	218	1	do	dust	160	33 bid
109	Hunugalla	220	11	do	sou	1100	40
110	Amblakande	222	19	do	bro or pek	1900	52
111	Do	224	30	do	pekoe	2700	43 bid
112	Do	226	2	do	sou	180	39
113	Do	228	1	do	bro mix	120	37
114	Avisawella	230	1	do	unas	105	41
115	H	232	5	hf-ch	bro pek	224	45

Lot No.	Mark	Box No	Pkgs.	Description.	Weight. lb.	c.
116	Ambleside	234	9 do	bro pek	393	48 bid
117	Do	236	15 ch	pek sou	1424	39 bid
118	Melrose	238	30 hf-ch	bro pek	1800	56
119	Do	240	22 ch	pekoe	2200	45
120	Do	242	17 do	pek sou	1700	42
121	Do	244	1 do	congou	100	36
122	Melrose D	246	17 hf-ch	bro pek	952	55
123	Do	248	7 ch	pekoe	700	44
124	Do	250	5 do	pek sou	500	42
125	W D B	252	1 box	or pek	10	62
126	Do	254	1 do	bro pek	10	42
127	Do	256	1 do	pekoe	10	41
128	Do	258	1 do	pek sou	10	40
129	Patiagame	260	15 ch	bro pek	1650	50 bid
130	Do	262	25 do	pekoe	2510	43 bid
131	Do	264	1 do	pek sou	110	39
132	Do	266	2 do	dust	300	32
133	Do	268	1 do	bro mix	95	33

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room today, 6th May, the undermentioned lots of Tea (71,468 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Bulatgama	74	3 hf-ch	bro pek	150	50
2	Do	75	8 do	pekoe	400	42 bid
3	Do	76	6 do	pek sou	305	37
4	Do	77	1 do	bro tea	46	30
5	K G H	78	1 do	fans	60	30
6	C A, in estate mark	79	7 do	unas	335	39
7	Do	80	4 do	bro mix	228	30 bid
8	Do	81	1 do	dust	60	32
9	Lyndhurst	82	17 ch	bro pek	1870	50
10	Do	83	34 do	pekoe	3230	40 bid
11	Do	84	11 do	pek sou	1045	36 bid
12	Manickande	85	4 do	bro pek	400	49
13	Do	86	8 hf-ch	pekoe	435	33 bid
14	Do	87	10 ch	pek sou	1094	33 bid
15	Do	88	17 do	bro mix	1581	24 bid
16	Allakolla	89	24 hf-ch	bro pek	1560	49 bid
17	Do	90	34 ch	pekoe	3570	42 bid
18	Do	91	26 do	pek sou	2600	39 bid
19	Do	92	1 hf-ch	dust	100	31
20	Hiralouvah	93	20 ch	bro pek	2054	41 bid
21	Do	94	1 do	bro pek No. 2	102	39
22	Do	95	9 do	pek sou	900	40
23	Do	96	1 do	bro mix	98	30
24	Do	97	4 hf-ch	dust	280	32
25	Roseneath	98	22 do	bro pek	1540	48 bid
26	Do	99	16 ch	pekoe	1760	43
27	Do	100	17 do	pek sou	1870	39
28	Stockholm	1	27 hf-ch	or pek	1485	51 bid
29	Do	2	19 ch	pek sou	1805	41 bid
30	Do	3	1 do	fans	140	29 bid
31	H G A	4	3 do	bro tea	300	29
32	Do	5	5 hf-ch	dust	350	31
33	H D	6	17 do	bro tea	850	36
39	Crurie	12	22 do	bro pek	2420	53 bid
40	Dambla-golla	13	31 do	pekoe	3100	43 bid
41	Do	14	12 do	bro pek	1320	52 bid
42	Do	15	13 do	pek sou	1235	39 bid
43	I N G, in estate mark	16	9 do	bro pek	900	58
44	Do	17	15 do	pekoe	1500	46
45	Do	18	21 do	pek sou	2100	44
46	Do	19	3 do	bro mix	300	35
47	Do	20	4 do	fans	400	38
48	Do	21	2 do	dust	200	30
49	E A T S, Cross in estate mark	22	5 do	bro pek	550	51 bid
50	Do	23	6 do	pekoe	570	43 bid
51	St. Andrews	24	19 hf-ch	bro pek	1235	45
52	Do	25	39 do	pekoe	2496	43 bid
53	Pallai	26	24 do	pek fans	960	out
54	Do	27	2 ch	dust	276	18 bid
55	P W E C, in estate mark	28	16 do	bro pek	1520	46 bid
56	Do	29	25 do	pekoe	2000	40 bid
57	Do	30	20 do	pek sou	1600	39 bid
58	D B	31	7 do	pek sou	700	35 bid
59	Do	32	4 do	pek sou	400	35 bid
60	M	33	5 do	bro tea	600	32 bid
61	B B	34	2 do	pekoe	200	38 bid

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
62	P S	35	6 hf-ch	pekoe	270	42 bid
63	Do	36	1 ch	pek sou	39	36
64	N B	37	16 do	bro tea	1500	33
65	C C	38	10 do	pekoe	960	37
66	Killin	39	17 ch	bro pek	1700	44 bid
67	Do	40	9 do	pekoe	855	40 bid
68	Do	41	9 do	pek sou	810	39
69	Do	42	4 do	bro tea	400	29 bid
70	Do	43	3 do	dust	390	31

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room today, 6th May, the undermentioned lots of Tea (158,679 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Feteresso	270	2 ch	sou	180	35
2	Do	272	1 do	dust	150	32
3	A M B	274	11 do	bro tea	990	28
4	Macaldenia	276	20 hf-ch	bro pek	1200	47 bid
5	Do	278	12 do	pekoe	600	44
6	Do	280	12 ch	pek sou	1260	42
7	Do	282	4 do 1 hf-ch	pek sou	450	38
8	Do	284	2 ch	dust	148	32
9	Do	286	1 hf-ch	red leaf	28	32
10	Ampitia	288	2 ch	pekoe	200	38
11	Do	290	1 do	sou	90	31
12	Do	292	2 do	bro mix	235	24
13	Do	294	10 hf-ch	dust	800	31
14	Bearwell	295	1 do	dust	62	31
15	Do	298	1 do	congou	56	32
16	Court Lodge	300	41 do	bro pek	2295	70
17	Do	302	21 do	pekoe	966	54 bid
18	Do	304	26 do	pek sou	1170	46 bid
19	Nahavecna	306	39 do	bro pek	1950	47 bid
20	Do	308	17 do	pekoe	850	43
21	Do	310	40 do	pek sou	2000	42
22	Do	312	2 do	dust	140	30
23	Do	314	1 do	congou	55	31
24	H E P, in estate mark	316	40 do	bro pek	2400	50 bid
25	Do	318	51 do	pekoe	3060	48
26	Do	320	44 do	pek sou	2640	41 bid
27	Aigburth	322	25 ch	bro pek	2500	49
28	Do	324	3 do	bro pek X	300	out
29	Do	326	16 do	pekoe	1600	41 bid
30	Do	328	14 do	pek sou	1400	41 bid
31	Do	330	2 do	dust	303	32
32	Do	332	2 do	pek fan	177	37
33	Mahatenne	334	4 hf-ch	bro or pek	240	50
34	Do	336	4 do	or pek	240	50
35	Do	338	10 do	pek sou	600	42
36	Do	340	1 do	congou	60	34
37	Yataderia	342	18 do	bro pek	1980	49
38	Do	344	44 do	pekoe	4400	42
39	Do	346	48 do	pek sou	4320	39
40	Do	348	11 do	bro tea	990	32
41	Bandara-polla 11	350	30 do	bro pek	1500	44 bid
42	Do	352	22 do	pekoe	1100	39 bid
43	Do	354	23 do	pek sou	1035	38
44	Bandara-polla 12	356	25 do	pek sou	1125	38
45	Bandara-polla 13	358	27 do	pek sou	1215	38
46	Do	360	4 do	dust	280	31
47	Do	362	4 do	bro pek No 2.	220	36
48	California	364	1 do	bro pek	50	50
49	Do	366	1 do	pekoe No. 1	50	43
50	Do	368	1 do	pekoe „ 2	50	38
51	Do	370	1 do	pek sou	50	36
52	Do	372	4 do	pek sou No 1	200	37
53	Do	374	2 do	pek sou „ 2	100	34
54	G A E	376	9 ch 1 hf-ch	pek sou	906	35
55	Do	378	7 do	fans	500	32
56	Shrub's Hill	380	50 do	bro pek	3750	48 bid
57	Do	382	54 do	pekoe	3210	40 bid
58	Do	384	74 do	pek sou	4070	40
59	Do	386	6 do	sou	432	35
60	Do	388	7 do	dust	770	32
61	Craighead	390	30 do	bro or pek	1500	45 bid
62	Do	392	22 ch	pekoe	1980	42 bid
63	Do	394	11 do	pek sou	1530 }	out
64	Do	396	8 do	sou	680 }	out

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
65	Glengariffe	393	4 do	bro tea	420	33
66	Do	400	2 do	dust	200	31
67	D, in estate mark	402	7 do 1 hf-ch	bro pek	750	49
68	Do	404	11 ch	pekoe No. 1	1100	45
69	Do	406	7 do 1 box	pekoe No 2	720	39
70	Do	408	2 ch	dust	250	20
71	Do	410	1 do	red leaf	117	29
72	H	414	2 hf-ch	dust	100	30
73	St. Leonard's	416	1 ch	pek sou	90	41
74	Do	418	1 do	dust	144	31
75	Esperanza	420	12 hf-ch	or pek	600	62
76	Do	422	38 do	pekoe	1748	43
77	Do	424	1 do	congou	50	31
78	Marguerita	426	20 do	bro pek	1200	50 bid
79	Do	428	22 do	pekoe	1100	43 bid
80	Do	430	39 do	pek sou	2145	41
81	Handrokande	432	9 do	bro pek	450	44
82	Do	434	8 do	pekoe	400	39
83	Do	436	21 do	pek sou	1050	38
84	Do	438	1 do	dust	60	31
85	Galkadua	440	8 do	bro pek	400	52
86	Do	442	16 do	pekoe	800	40
87	Do	444	10 do	pek sou	500	38
88	G	446	2 do	unas	100	28
89	Polatagama	448	42 do	bro pek	2520	49 bid
90	Do	450	90 do	pekoe	4500	44
91	Do	452	85 do	pek sou	4250	41
92	Alamalla	454	7 do	bro mix	455	33
93	Do	456	5 do	dust	450	32
94	Mukeloya	458	12 do	bro pek	720	47 bid
95	Do	460	17 do	pekoe	935	43
96	Do	462	22 do	pek sou	1100	40
97	Do	464	3 do	bro tea	180	32
98	Do	466	2 do	dust	140	31
99	Chesterford	468	36 do	bro pek	2300	46 bid
100	Do	470	46 do	pekoe	2200	38
101	Do	472	18 do	pek sou	900	37
110	W G	490	23 do	bro pek	2300	45 bid
111	Do	492	54 do	pekoe	5130	41 bid
112	Do	494	45 do	pek sou	4050	39 bid
113	Clyde	496	14 do	bro pek	1473	46 bid
114	Do	498	16 do	pekoe	1520	out
115	Do	500	7 do	pek sou	665	38 bid
116	Yataderia	502	18 do	bro pek	1980	49
117	Do	504	32 do	pekoe	3200	42
118	Do	506	38 do	pek sou	3420	38
119	Do	508	10 do	bro tea	900	31
124	G L, in estate mark	518	33 do	bro pek	2630	47 bid
125	Do	520	26 do	pekoe	2470	39 bid
126	Do	522	5 do	pek sou	450	38
127	G L	524	23 do	bro pek	2300	42 bid
128	Do	526	9 do	pekoe	810	40 bid
129	Do	528	4 do	pek sou	360	37
130	Do	530	3 do	sou	270	35
131	Do	532	1 do	dust	150	34
132	Debatgama	534	2 do	dust	240	30
133	M V S	536	1 do	pekoe	105	40
134	Do	538	7 hf-ch	pekoe	397	39
135	B E R	540	4 ch	or pek	360	41
136	Do	542	4 do	bro pek	400	34
137	Do	544	21 do	pek sou	1890	36
138	Do	546	3 do	dust	420	32
139	Silver Valley	548	1 do	bro pek	70	54
140	Do	550	5 do	pekoe	400	39
141	Do	552	2 hf-ch	red leaf	100	30
142	Do	554	1 do	congou	40	31
143	Do	556	1 do	bro tea	60	27
144	H &H	558	12 ch	bro mix	1175	30
145	F, in estate mark	560	25 hf-ch	pek dust	1961	25 bid
146	Singleton	562	26 do	bro pek	1508	40 bid
147	Do	564	28 do	pekoe	1540	39 bid
148	Horagaskelle	566	6 do	bro pek	360	44
149	Do	568	7 do	pekoe	350	41
150	Do	570	11 do	pek sou	616	37
151	Do	572	1 do	congou	52	29
152	Kirrimettia	574	11 do	bro pek	580	51
153	Do	576	30 do	pekoe	1500	40
154	Do	578	2 do	pek fan	140	34
155	Bandarapolla	580	19 do	bro pek	950	43 bid
156	Do	582	25 do	pekoe	1250	39
157	Do	584	28 do	pek sou	1260	37

CEYLON COFFEE SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, April 17th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 17th April:—

Ex "Clan Buchanan"—Theresia, 2c 1b 111s; 3c 107s; 1t 105s; 1c 130s; 1c 99s 6d; 1b 106s. Warleigh, 1b 113s; 1c 1t 111s; 2c 108s; 1b 104s; 2b 134s; 1b 97s.

Ex "Ping Suey"—Kotiyagalla, 2c 103s 6d; 1b 101s; 1b 111s; 1b 92s; 1c 1t 84s 6d; 2c 108s; 1b 96s.

Ex "Oroya"—Kotiyagalla, 1b 1t 104s 6d; 1b 102s; 1b 110s; 1b 90s; 1c 90s; 1b 98s.

Ex "City of London"—Gavatenne, 1b 94s; 1b 93s.

Ex "Scindia"—Ouvah, 2c 112s; 6c 107s 6d; 1c 104s 6d; 1c 124s; 1c 98s 6d; 2b 105s; 1b 97s.

Ex "City of London"—Meriagama, 1b 2c 101s 6d; 1b 100s; 1t 106s; 1b 94s.

Ex "Clan Buchanan"—West Holyrood, 2c 1t 103s 6d; 1c 1t 100s 6d; 1c 1b 107s 6d; 1b 104s; 3b 108s; 1t 103s 6d; 1t 121s; 1t 95s; 1c 93s; 1b 101s; 1c 1b 82s 6d; 1b 92s; 1b 84s; 1b 95s. Niabedda, 1c 112s; 4c 108s 6d; 2c 105s 6d; 1t 125s; 1c 99 ; 1b 101s.

Ex "Persia"—Wannarajah, 1b 109s; 2c 1t 112s; 4c 109s; 2 1b 103s 6d; 1c 133s; 1c 97s 6d. Manickwatte, 1t 109s; 1c 1t 106s 6d; 1c 105s; 1t 137s; 1b 96s. Wannarajah, 1b 105s 6d. Manickwatte, 1b 105s 6d.

Ex "Clan Buchanan"—Walton, 1c 105s; 1c 1t 104s 6d; 1t 102s; 1b 110s; 1c 2b 96s; 1b 93s.

Ex "Oroya"—J. J. Vanderspar & Co., O, 25 bags 93s 6d native.

CEYLON COCOA SALES IN LONDON.

(From Wilson, Smithett, & Co's. Circular.)

MINCING LANE, April 17th, 1891.

Ex "Falls of Inversnaid"—Delgolla, 61 bags 117s; 10 74s; 3 90s 6d.

Ex "Myrmidon"—Gangoroowa, 1 bag 93s 6d.

Ex "Ping Suey"—Lemagastenne, 11 bags 116s 6d; 1 65s; 4 65s.

Ex "Falls of Inversnaid"—(M&Co.), 7 bags 118s 6d; 4 115s; 1 75s, 47 119s 6d; 20 120s; 7 90s; 12 77s 6d; 4 52s 6d; 16 120s 6d; 2 71s 6d; 15 120s 6d; 2 71s 6d; 33 90s. Eriagastenne, 1 bag 115s; 45 120s; 7 93s; 4 120s 6d.

Ex "Gaekwar"—Gangwarily, 14 bags 120s 6d; 1 75s; 2 72s.

Ex "Asia"—Crystal Hill, 12 bags 95s.

Ex "Myrmidon"—Kepitigalla, 1 bag 58s.

Ex "Don"—Concordia, 14 bags 68s.

Ex "Essequibo"—Concordia, 21 bags 68s. La Sieva, 20 bags 70s; 20 69s.

Ex "Clan Buchanan"—Warriapolla, 40 bags 124s; 20 123s 6d; 8 79s; 7 53s 6d; 2 56s.

Ex "Falls of Inversnaid"—Warriapolla, 56 bags 122s; 101 122s 6d; 14 72s. Suduganga, 3 bags 67s; 11 69s; 11 52s 6d; 3 86s.

Ex "Myrmidon"—Warriapolla, 1 bag 58s.

CEYLON CARDAMOM SALES IN LONDON.

(From Our Commercial Correspondent.)

MINCING LANE, April 17th, 1891.

Ex "Ping Suey"—Mt. Pleasant, 2 cases 2s 2d. New Peacock, 1 case 2s 3d; 4 2s 2d; 2 1s 8d.

Ex "Ajax"—Balcar.es, 1 case 1s 11d; 1 9d; 1 1s 2d; 1 1s 3d; 1 1s 7d.

Ex "Glengarry"—Elkadua, 1 case 1s 11d.

TEA, COFFEE, CINCHONA, COCOA, AND CARDAMOM SALES.

No. 14.] COLOMBO, MAY 23, 1891. {PRICE:—12½ cents each; 3 copies 30 cents; 6 copies ½ rupee.

COLOMBO SALES OF TEA.

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room on the 6th May, the undermentioned lots of Tea (32,468 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Managalla	1	3 hf-ch	pekoe	148	38
2	Kelani	2	6 do	bro or pek	300	43 bid
3	Do	4	16 do	bro pek	880	48 bid
4	Do	6	72 do	pekoe	3240	41 bid
5	Do	8	52 do	pek sou	2340	39
6	Do	10	1 do	dust	75	31
9	I B, in estate mark	15	38 box	or pek	760	50 bid
	(Not exceeding 28 lb. gross.)					
10	Do	17	32 cb	pekoe	2720	38 bid
11	Nahalma	19	38 bf-ch	bro pek	2090	45 bid
12	Do	21	42 ch	pekoe	4200	38 bid
13	Do	23	3 do	pek sou	300	30 bid
14	Do	24	1 hf-ch	dust	80	32
20	Mohedin	32	2 do	bro pek	84	50
21	Do	33	4 do	pekoe	176	40
22	Do	34	5 do	pek sou	215	38
23	Do	35	1 do	congou	45	28
24	Do	36	1 do	bro pek fans	45	32
25	Do	37	3 do	red leaf	132	27
26	G H K Ceylon, in estate mark	38	14 ch	pek sou	1330	38
27	Do	40	1 do	sou	90	29
28	Do	42	3 hf-ch	bro sou	171	26 bid
29	Do	42	1 do	dust	45	30
39	D F, in estate mark	105	20 do	pekoe	1900	38 bid
40	Do	107	34 do	„ No 2	3060	35 bid
41	Do	109	31 do	pek sou	2790	35 bid
42	Do	111	15 do	fans	1500	31 bid
43	Albion	113	12 do	bro pek	1320	60
44	Do	115	12 do	pekoe	1200	51
45	Do	117	12 do	pek sou	1200	41
46	Maddegedera	119	37 hf-ch	bro pek	1998	51
47	Do	121	30 do	pekoe	1500	43
48	Do	123	26 do	pek sou	1118	42
49	Do	125	1 do	sou	52	30
50	Do	126	1 ch	dust	156	30
51	W K	127	3 do	red leaf	171	26
52	D E	128	7 hf-ch	fans	595	28
53	K B	129	9 ch			
			1 hf-ch	bro mix	808	27

Mr. E. JOHN put up for Sale at the Chamber of Commerce Sale-room on the 6th May, the undermentioned lots of Tea (54,589 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Labugama	35	3 hf-ch	congou	120	31 bid
2	Do	36	2 do	red leaf	100	27
3	Do	37	2 do	pek dust	150	30
4	Do	38	6 do	pek fan	270	35
5	Do	39	8 do	sou	320	37
6	Do	40	34 do	pekoe	1360	41
7	Do	42	11 do	bro pek	440	49
8	Do	44	4 do	bro or pek	200	37 bid
9	Brownlow	45	13 ch	bro pek	1300	48 bid
10	Do	47	15 do	pekoe	1425	42 bid
11	Do	49	11 do	pek sou	880	39
12	Do	51	1 do	dust	70	32
13	Kinagoda	52	27 hf-ch	bro pek	1620	48 bid
14	Do	54	33 ch	pekoe	1300	41 bid
15	Do	56	10 do	pek sou	1000	40
16	Bollagalla	58	19 hf-ch	bro pek	1140	49
17	Do	60	33 ch	pekoe	2970	39 bid
18	Do	62	25 do	pek sou	2250	37
19	Cruden	64	22 hf-ch	sou	1210	32
20	Meedoopittiya	66	4 do	bro or pek	240	47 bid
21	Do	67	4 do	or pek	240	45 bid
22	Do	68	10 do	pekoe	600	41
23	Madooltenne	70	11 ch	bro pek	1210	43 bid
24	Do	72	13 do	pekoe	1300	35 bid
25	Do	74	13 do	pek sou	1300	36
26	Faithlie	76	1 do	sou	60	32
27	Do	77	1 do	bro mix	60	29
28	Do	78	4 hf-ch	dust	300	34
29	Anchor, in estate mark	79	14 ch	bro pek	1610	57 bid
30	Do	81	31 do	pekoe	3100	45
31	Do	83	21 do	pek sou	2100	47
32	Doranakanda	85	3 hf-ch	pek fans	150	33
33	Do	86	10 ch	sou	900	35
34	Do	88	2 hf ch	dust	140	31
35	Orange Field P N R	89	6 ch	bro pek	600	48
36	Do	101	29 do	pekoe	2610	38 bid
37	Do	103	5 do	sou	450	25
38	Do	104	1 do	dust	126	30

Mr. E. BENHAM put up for sale at the Chamber of Commerce Sale-room on the 13th May, the undermentioned lots of Tea (2,045 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	W O	26	7 ch	bro tea	735	30
2	Do	28	5 do	fans	400	30
3	Elston	30	7 do	dust	910	28

Messrs. A. H. THOMPSON & Co. put up for sale at the Chamber of Commerce Sale-room on the 13th May, the undermentioned lots of Tea (105,472 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Mauagalla	1	1 hf-ch	bro or pek	50	36
2	Do	2	2 do	pekoe	100	34
9	A K A C, in estate mark, Ceylon	12	25 hf-ch	bro pek	1250	44 bid
10	Do	14	48 do	pekoe	2400	34 bid
11	Do	16	18 do	sou	900	31 bid
12	Yarrow	18	14 ch	bro pek	896	42 bid
13	Do	20	25 do	pekoe	1500	38 bid
14	Do	22	9 do	pek sou	504	35
15	B O	24	1 do	sou	90	31
16	Do	25	1 hf-ch	unas	56	35
17	Horagoda	26	18 ch	bro pek	1800	40 bid
18	Do	28	43 do	pekoe	3870	35 bid
19	Do	30	1 do	pek sou	100	33
20	Do	31	1 do	dust	137	28
21	Do	32	1 hf-ch	red leaf	55	27
22	A G C	33	4 ch			
			1 hf-ch	congou	410	28
23	Do	34	13 do	pek dust	910	28
24	Nahalma	36	35 do	bro pek	1925	41 bid
25	Do	38	42 ch	pekoe	4200	34 bid
26	Do	40	5 do	pek sou	500	32 bid
27	Do	41	1 hf-ch	dust	70	29 bid
28	Agra Oya	42	28 ch	bro pek	2800	43 bid
29	Do	44	19 do	pekoe No. 1	1900	37 bid
30	Do	46	24 do	do No 2	2400	33 bid
31	Do	48	1 do	bro mix	100	34
32	Do	49	3 do	dust	300	30
33	Harrow	50	10 hf-ch	bro pek	600	47
34	Do	52	14 do	pekoe	770	36
35	Do	54	29 do	do	1595	34 bid
36	Do	56	2 do	bro tea	140	29 bid
37	Relugas	57	32 do	bro pek	1760	41 bid
38	Do	59	21 ch	pekoe	2310	35
39	Do	61	28 do	pek sou	2800	33
40	Do	63	1 do	dust	140	27
41	Commillah	64	8 hf-ch	bro pek	440	39 bid
42	Do	66	11 do	pek sou	550	33
43	Do	68	1 do	dust	80	28
48	Kelani	76	16 hf-ch	bro pek	880	45 bid
49	Do	78	72 do	pekoe	3240	36 bid
53	P O	86	3 hf-ch	bro pek	181	51
54	Do	87	3 do	pekoe	162	38
55	Do	88	11 do	pek sou	628	33
56	Do	90	4 do	unas	223	33
57	Do	91	2 do	congou	76	25
58	Do	92	1 do	dust	58	27

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight. lb.	c.
59	R, in estate mark	93	2 ch	bro pek sou	100	30
60	Do	94	2 do	bro mix	132	32
61	Torrington	95	27 do	bro or pek	2970	48 bid
			28 do	do	2860	
62	Do	97	34 do	bro pek	3740	40 bid
			34 do	do	3740	
63	Do	99	42 do		4200	35 bid
			41 do	pekoe	4100	
			41 do		4100	
64	Do	101	30 do	pek sou	3000	32 bid
			30 do		3000	
65	Do	103	15 hf-ch	dust	1200	29
66	B U S	105	4 ch	congou	412	26
67	S C R	106	6 hf-ch	pek sou	300	30 bid
68	Do	107	1 do	dust	77	28

Mr. E. John put up for sale at the Chamber of Commerce Sale-room on the 13th May, the undermentioned lots of Tea (68,202 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	D F D	130	7 ch	pek sou	665	36
2	Temples-towe	132	9 hf-ch	dust	780	31
8	Bollagalla	144	33 do	pekoe	2970	34 bid
9	Meedompi-tiya	146	4 hf-ch	bro or pek	240	40 bid
10	Orange Field	147	29 ch	pekoe	2610	28 bid
11	Gonavy	149	63 do	bro pek	6300	out
12	Do	151	24 do	pekoe	2160	36 bid
13	Do	153	12 do	pek sou	1080	34 bid
14	Do	155	3 do	dust	375	29
15	Stamford Hill	156	18 do	bro pek	1800	31 bid
16	Do	158	27 do	pekoe	2430	out
17	Do	160	7 do	bro mix	840	out
18	Albion	162	26 do	bro pek	2360	50
19	Do	164	25 do	pekoe	2500	37 bid
20	Do	166	33 do	pek sou	3300	36 bid
21	Do	168	1 do	sou	100	32
22	Do	169	8 do	dust	640	31
23	Do	170	1 do	red leaf	100	29
24	Kandnewera	171	21 do	bro pek	1890	41 bid
25	Do	173	25 do	pek sou	2750	37 bid
26	Caledonia	175	14 do	bro pek	1540	47 bid
27	Do	177	16 do	pekoe	1440	40 bid
28	Do	179	5 do	pek sou	425	36 bid
29	Brownlow	181	17 do	bro pek	1870	out
30	Do	183	24 do	pekoe	2400	out
31	Do	185	11 do	pek sou	1045	36
32	Do	187	1 hf-ch	dust	70	28
33	B T	188	39 ch	bro mix	3510	29
34	Ayr	190	2 hf-ch	bro pek No. 1	110	36 bid
35	Do	191	21 do	do No. 2	1050	50
36	Do	193	28 do	pekoe	1176	39 bid
37	Do	195	30 do	pek sou	1260	35
38	Do	197	5 do	congou	215	28
39	Do	198	5 do	fans	250	28 bid
40	Do	199	1 do	pek dust	71	28
41	Blackburn	200	16 ch	bro pek	1590	38
42	Do	202	2 do	pek sou	155	31 bid
43	Madooltenne	203	11 do	bro pek	1210	34 bid

Messrs. Somerville & Co. put up for sale at the Chamber of Commerce Sale-room on the 13th May, the undermentioned lots of Tea (55.982 lb.), which sold as under :—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	E L K	44	17 ch	bro mix	1581	28
2	Do	45	6 hf-ch	pek sou	305	35
3	Abbotsford	46	11 ch	bro mix	990	33
4	Do	47	5 hf-ch	pek dust	350	30
5	H H	48	4 ch	pekoe	361	34
6	N	49	13 hf-ch	pek sou	650	29
7	N	50	1 ch	bro tea	90	31
8	Narangoda	51	3 do			
			1 hf-ch	or pek	385	46 bid
9	Do	52	5 ch			
			1 hf-ch	pekoe	600	40 bid
10	Do	53	17 ch			
			5 hf-ch	pek sou	1950	38
11	Do	54	2 do	sou	90	31
12	Do	55	2 do	dust	150	30
13	W A H	56	14 ch	pekoe	1400	29
14	Do	57	2 do			
			1 hf-ch	bro tea	298	out
15	Do	58	4 ch	dust	560	28

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
16	Depedeoe	59	17 hf-ch	bro pek	850	46 bid
17	Do	60	33 do	pekoe	1650	40
18	Do	61	37 do	pek sou	1850	36
19	H D	62	61 do	bro tea	3050	33
20	Do	63	8 do	bro mix	400	27
21	Do	64	4 do	dust	320	28
22	Ederapolla	65	32 do	bro pek	1600	44
23	Do	66	18 ch	pekoe	1620	39
24	Do	67	17 do	do No 2	1530	35
25	Do	68	5 do	sou	450	30 bid
26	Do	69	2 do	bro tea	200	31
27	St. Andrew's T N C	70	14 hf-ch	or pek	924	57
28	Do	71	13 do	bro pek	832	44 bid
29	Do	72	19 do	pekoe	1805	41 bid
30	Hiralouvah	73	14 ch	bro pek	1472	40 bid
31	Do	74	16 do	pekoe	1593	36 bid
32	Do	75	1 do	fans	115	30
33	Do	76	1 do	bro mix	106	28
34	Do	77	3 do	dust	213	28
35	Blairavon	78	12 do	bro pek	1200	42 bid
36	Do	79	20 do	pekoe	1900	30 bid
37	Do	80	17 do	pek sou	1445	34 bid
38	Do	81	1 do	bro tea	90	28
39	Do	82	1 do	dust	120	28
40	Hatdowa	83	4 do	bro pek	400	49
41	Do	84	15 do	bro tea	1500	31 bid
42	Do	85	1 do	red leaf	100	26
43	P	86	1 do	dust	160	27
44	Lyndhurst	87	34 do	pekoe	3230	40 bid
45	B D	88	9 do	pekoe	855	35 bid
29	Pallai	91	2 ch			
			6 hf-ch	pek fans	696	11 bid
49	Allakolla	92	24 do	bro pek	1560	44 bid
50	Roseneath	93	22 do	bro pek	1540	43 bid
51	H J S	94	2 do	bro pek	100	48
52	Do	95	6 do	pekoe	300	35 bid
53	Do	96	8 do	pek sou	400	32 bid
55	Charlie Hill	97	2 hf-ch	bro pek	100	53
56	Do	98	2 do	pekoe	89	37
57	Do	99	6 do	pek sou	290	33
58	Do	100	5 do	sou	160	27
59	Do	1	1 do	fans	35	31
60	Allawa	2	26 do	bro pek	1508	40 bid
61	Do	3	28 do	pekoe	1540	35 bid
62	R S P	4	6 do	pekoe	270	37
63	Do	5	1 do	pek sou	40	28
64	Malgola	6	20 do	bro pek	990	45 bid
65	Do	7	1 do	do	51	40 bid

Messrs. Forbes & Walker put up for sale at the Chamber of Commerce Sale-room on the 13th May, the undermentioned lots of Tea (148,792 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
1	Rickarton	586	2 hf-ch	bro tea	100	29
2	Do	588	8 do	dust	640	29
3	D C	590	2 ch	bro pek	200	42
4	Do	592	4 do	pekoe	400	35
5	Do	594	5 do	pek sou	500	30
6	Katugalla	596	9 do	bro pek	990	41 bid
7	Do	598	9 do	pekoe	900	36 bid
8	Do	600	5 do	pek sou	550	32 bid
9	N, in estate mark	2	9 hf-ch	dust	675	28
10	Do	4	2 ch	unas	192	32
11	Do	6	1 do	bro mix	95	33
12	Dehiowita	8	12 do	bro pek	1260	out
13	Do	10	25 do	pekoe	2500	out
14	Do	12	10 do	pek sou	950	35
15	Do	14	1 do	bro tea	120	31
16	Yataderia	16	18 do	bro pek	1980	44 bid
17	Do	18	37 do	pekoe	3700	37 bid
18	Do	20	33 do	pek sou	2970	34
19	Doooevale	22	12 do	bro pek	1200	out
20	Do	24	17 do	pekoe	1530	30 bid
21	Do	26	1 do	bro mix	100	28
22	Do	28	1 do	fans	115	28
23	H O	30	5 do	congou	450	32
24	Do	32	4 do	fans	460	32
25	Do	34	3 do	dust	450	29
26	Do	36	1 do	bro tea	110	36
27	Invery	38	1 do	sou	81	36
28	Moorovia	40	6 ch	bro pek	600	44
29	Do	42	13 do	pekoe	1300	39
30	Do	44	5 do	pek sou	500	33
31	Do	46	1 do	bro mix	105	27
32	Do	48	1 do	dust	130	29
33	E K	50	1 hf-ch	bro pek	51	43
34	Do	52	1 ch	pekoe	100	33
35	Do	54	1 do	pek sou	86	29

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
36	Clarendon	56	32 hf-ch	bro pek	1792	52 bid
37	Do	58	25 ch	pekoe	2500	45
38	Do	60	12 do	pek sou	1080	38
39	Do	62	6 do	pek dust	720	28
40	Midlothian	64	22 hf-ch	bro pek	1100	43 bid
41	Do	66	24 ch	pekoe	2640	37 bid
42	Do	68	5 hf-ch	congou	250	31
43	Do	70	1 ch	dust	100	30
49	L, in estate mark	82	1 do	pekoe	39	39
50	Do	84	1 do	pek sou	33	32
51	Do	86	1 do	dust	48	28
52	Uvakelle	88	10 do	or pek	550	54
53	Do	90	22 do	pekoe	1100	43
54	Do	92	20 do	pek sou	1000	40
55	Do	94	8 do	sou	360	36
56	Do	96	4 do	fans	240	32
57	K S C, in estate mark	98	4 ch	bro pek	440	33 bid
58	Do	100	4 do	pekoe	380	34 bid
59	Do	102	1 do 1 hf-ch	bro mix	195	28
60	Do	104	1 do	red leaf	65	23
61	H E P, in estate mark	106	47 do	bro pek	2820	out
62	Do	108	31 do	pekoe	1860	out
63	Do	110	4 do	pek sou	240	36 bid
64	Do	112	2 do	dust	160	29
65	Atherfield	114	14 do	sou	700	32
66	Do	116	6 do	dust	480	28
67	Rambodde	118	14 ch	bro pek	1540	50 bid
68	Do	120	14 do	pekoe	1400	41 bid
70	Do	122	17 do	pek sou	1700	38 bid
71	Do	124	2 do	congou	200	33
72	Do	126	2 hf-ch	dust	153	29
73	B & D	128	4 ch	dust	600	28
56	C R D	130	6 hf-ch	dust	318	29
97	Do	132	2 do	red leaf	110	27
77	Bramley	134	2 ch	dust	236	29
61	B L G	136	4 hf-ch	bro pek	260	45
84	Do	138	3 do	pekoe	168	39
17	Do	140	2 do	pek sou	112	34
79	Mousakelle	142	18 ch	bro pek	2250	47 bid
80	Do	144	34 do	pekoe	3400	39 bid
81	Do	146	1 do	pek sou	125	31
82	Do	148	1 do 1 hf-ch	dust	260	25
83	Do	150	1 do	red leaf	50	27
84	K B	152	3 ch	red leaf	232	28
85	Chrystler's Farm	154	4 do	sou	360	33
86	Do	156	5 hf-ch	dust	425	30
87	Do	158	1 ch	bro mix	110	29
88	Kospelana	160	8 hf-ch	unas	400	35
89	Do	162	1 do	bro mix	50	28
90	Andangodde	164	4 ch	sou	340	30
91	Do	166	6 do	dust	900	28
92	Eadella	168	3 do	sou	255	30
93	Do	170	3 do	dust	330	29
94	G W	172	9 do	pekoe	862	35
95	Stisted	174	8 do	bro pek	800	48
96	Do	176	20 do	pekoe	2000	39
97	Do	178	5 do	pek sou	450	35
98	Do	180	1 hf-ch	dust	90	29
99	Blairgowrie	182	35 do	bro pek	1750	42 bid
100	Do	184	19 ch	pekoe	1805	37 bid
101	Do	186	12 do	pek sou	1140	35
102	Do	188	2 hf-ch	unas	170	32
103	Do	190	1 do	bro tea	42	26
104	Do	192	2 do	dust	148	28
105	Middleton	194	47 do	bro pek	2820	48
106	Do	196	21 ch	pekoe	2205	38 bid
107	Do	198	17 do	pek sou	1615	36
108	B & D	200	5 do	red leaf	563	23
109	Bandarapolla	202	24 hf-ch	bro pek	1200	42 bid
110	Do	204	18 do	pekoe	900	37
111	Do	206	23 do	pek sou	1035	34
112	Do	208	6 do	dust	420	29
113	Thornfield	210	25 do	bro pek	1500	56
114	Do	212	19 ch	pekoe	1900	40 bid
115	Do	214	13 do	pek son	1300	39
116	Do	216	2 hf-ch	dust	160	31
121	Theydon Bois	226	16 do	bro pek	1600	40 bid
122	Do	228	15 do	pekoe	1350	32 bid
123	Do	230	8 do	pek sou	680	26
124	Avisawella	232	3 do	dust	450	27
125	Farm	234	28 ch	bro pek	2240	42 bid
126	Do	236	28 do	pekoe	2520	36 bid
127	Do	238	28 do	pek sou	2240	34
128	Do	240	1 do	sou	72	28
129	Do	242	1 do	dust	150	31
137	Alnoor	258	23 hf-ch	bro pek	1150	42 bid
138	Do	260	24 do	pekoe	1200	36 bid
139	Do	262	12 do	pek sou	600	33 bid
140	Do	264	1 do	dust	80	27
141	Digdolla	266	19 ch	bro pek	1900	40 bid
142	Do	268	34 ch	pekoe	3060	35 bid
143	T G W	270	2 do	bro pek	190	42
144	Do	272	4 do 1 hf-ch	pekoe	360	35
145	Do	274	6 ch	pek sou	510	33
146	Harangalla	276	58 hf-ch	bro pek	3306	43 bid
147	Do	278	39 do	pekoe	2145	36 bid
148	Do	141	139 do	do	5640	out
149	K T G	282	1 hf-ch	bro pek	57	41
150	M C A	284	16 ch	pek sou	1472	31 bid
151	Do	286	6 do 2 hf-ch	fans	840	27
152	Columbia	288	23 do	bro pek	1380	61 bid
153	Do	290	21 do	pekoe	1050	56 bid
154	Do	292	2 do	pek sou	100	39
155	Do	294	1 do	dust	80	30
156	C R	296	17 do	bro pek fans	850	32
157	Do	298	5 do	bro pek sou	250	31
158	Do	300	3 do	bro pek dust	210	29

Mr. E. John put up for sale at the Chamber of Commerce Sale-room on the 20th May, the under-mentioned lots of Tea (18,770 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description	Weight lb.	c.
1	Panapitiya	204	1 hf-ch	bro pek	51	38
2	Do	205	3 do	pekoe	153	36
3	Do	206	6 do	pek sou	356	35
4	Do	207	2 do	unas	102	35
5	Do	208	1 do	congou	51	27
6	K	209	18 ch	bro pek	1260	42
7	K	211	16 do	pekoe	960	36
8	K	213	17 do	pek sou	1241	36
9	K	215	3 do	sou	156	27
10	K	216	1 do	dust	105	28
11	Agra Ouvah	217	12 hf-ch	pek sou	540	34
12	Do	219	5 do	pek fans	350	21
13	Logan	220	33 do	bro pek	1800	42 bid
14	Do	222	33 do	pekoe	1485	39
15	Do	224	60 do	pek sou	2700	36
16	Do	226	12 do	sou	540	34
17	Do	228	8 do	dust	480	30
18	Eila	229	2 ch	dust	250	27
20	K G	231	48 do	bro pek	2880	44
21	Do	233	15 ch	pekoe	1650	39
22	Do	235	11 do	pek sou	1210	36
23	Do	237	4 hf-ch	dust	340	27
24		238	4 ch	bro mix	380	31

Messrs. A. H. Thompson & Co. put up for sale at the Chamber of Commerce Sale-room on the 20th May, the undermentioned lots of Tea (64,379 lb.), which sold as under:—

Lot No.	Mark	Box No.	Pkgs.	Description.	Weight lb.	c.
8	C, in estate mark	10	2 hf-ch 1 box	bro pek	133	37
9	Do	11	8 hf-ch	unas	400	31
10	Do	13	4 do	bro tea	200	29
11	Do	14	2 do	dust	162	26
12	Do	15	3 do	fans	184	28
13	Do	16	1 do	red leaf	45	26
14	Atoluwa	17	5 do	bro pek	275	31
15	Do	18	5 do	pekoe	250	30
16	Do	19	5 do	sou	225	26
17	Do	20	1 do	bro pek sou	50	25
18	Glanrhos	21	16 ch	bro pek	1360	45
19	Do	23	19 hf-ch	pekoe	1425	39
20	Do	25	29 do	pek sou	2030	36
21	Do	27	3 do	congou	210	30
22	Do	28	1 ch	dust	110	28
23	Kintyre	29	16 hf-ch	bro pek	1040	52 bid
24	Do	31	5 do	imperial Green	300	45 bid
25	G	32	1 do	pekoe	65	31
26	Nahalma	33	46 do	bro pek	2530	49
27	Do	35	51 ch	pekoe	5100	36
28	Do	37	9 do	pek sou	900	34
29	Do	39	1 hf-ch	dust	80	28
34	A G C	47	5 do	congou	450	25
35	Do	48	10 hf-ch	dust	560	26

Lot No.	Mark	Box No.	Pkgs.		Description.	Weight lb.	c.
36	I B, in estate mark	50	30	ch	bro or pek	3000	43 bid
37	Do	52	73	do	pekoe	6570	35 bid
38	Do	54	32	do	pekoe	2720	36
39	D G A O, in estate mark	56	23	do	bro pek	2300	44 bid
40	Do	58	41	do	pekoe	4100	37 bid
41	Do	60	31	do	pek sou	3100	34 bid
42	Woodend	62	17	do	bro pek	1700	41 bid
43	Do	64	29	do	pekoe	2755	37
44	Do	67	6	do	pek sou	510	34
45	Do	68	1	do	dust	135	27
46	K P W	69	26	hf-ch	bro pek	1300	44 bid
47	Do	71	40	do	pekoe	1800	39 bid
48	Do	73	37	do	pek sou	1665	36
49	Do	75	10	do	sou	450	34
50	Do	77	2	do	dust	140	26 bid

CEYLON COFFEE SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, April 24th, 1891.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 24th April:—

Ex "Gaekwar"—Lindoola 13s; 14s; 3c 1b 111s 6d; 1b 104s; 1b 143s.

Ex "Persia"—Hornsey, 11c, 1b 13c 110s; 1c 1b 105s; 1c 137s.

Ex "Pallas"—Coombewood, 3c 112s; 3c 1b 107s 6d; 1t 104s; 1c 1b 138s.

Ex "Persia"—Derry clare, 2c 111s; 2c 107s 6d; 1c 104s; 1t 136s.

Ex "City of Dundee"—Morar. 1c 108s; 1b 164s; 1b 112s. Kahagalla, 1c 1b 110s; 2c 1b 108s 6d; 1b 104s; 1c 124s.

Ex "Pallas"—Drayton, 4c 116s; 5c 1t 108s 6d; 1c 1b 131s; 1c 99s 6d; 2b 97s; 2b 94s 6d; 1b 102s; 1b 105s; 2b 107s; 1b 105s.

Ex "City of Dundee"—Dunsinane, 2c 110s; 5c 108s 6d; 1c 104s 6d; 1c 128s. Tillicoultry, 2c 1b 107s; 1c 103s; 6d. Wattegodde, 1c 2b 111s; 2c 1b 109s; 1b 104s; 1t 129s. Somerset, 1c 111s; 2c 1b 109s 6d; 4c 107s 6d 1b 102s 6d; 1c 125s.

Ex "Gaekwar"—Blair Athol, 1b 109s; 2c 1b 107s 6d; 1b 102s; 1b 120s; 1b 99s. Ardlaw, 1b 109s; 2c 1b 107s 6d; 1b 104s 6d; 1b 130s; 1b 100s; 1b 106s.

Marks and prices of CEYLON COFFEE sold in Mincing Lane up to 1st May:—

Ex "Pallas"—Logie, 1c 1t 111s; 4c 1b 109s; 1c 1b 104s 6d; 2c 131s. Milnathort, 7c 1b 109s, 2c 105s 6d; 1b 102s; 1t 115s.

Ex "Orizaba"—Freshwater, 3c 1b 110s 6d; 8c 108s; 1c 2b 104s 6d; 1c 1b 133s 6d; 2c 130s 6d. Lunugalla, 1b 108s; 3c 1t 106s; 2c 102s; 1t 99s; 1c 116s; 1c 108s; 2c 1b 106s 6d; 1b 101s; 1b 1t 1c 117s 6d.

Ex "Ningchow"—Venture, 1t 109s; 2c 106s 6d; 1b 103s; 1b 116s.

Ex "Pakling"—Venture, 2c 1b 107s 6d.

Ex "Port Denison"—Alloowibare, 1t 106s. Kellebokka, 2c 1b 100s; 2c 1t 107s; 1b 100s; 1b 113s.

Ex "Ningchow"—Glassaugh, 1c 109s; 2c 1b 106s; 1b 103s; 1b 96s; 1b 100s. PDO, 1b 115s; 1c 1b 112s 6d; 3c 108s; 1b 103s; 1t 131s. Yoxford, 1b 114s; 2c 112s 6d; 4c 107s 6d; 2b 104s 6d; 1c 134s; 1c 110s 6d. Bridwell, 1t 110s 6d; 5c 1t 106s; 1c 104s 6d; 1c 1b 131s. Kirkoswald, 1b 109s; 1c 105s; 1b 103s; 1b 111s. Eildon Hall, 1b 113s; 1c 109s; 2c 1t 107s; 1b 103s 6d; 1c 134s.

Ex "Rewa"—Denegama, 1t 107s 6d; 1c 1t 106s; 2c 1b 104s; 1b 98s; 1t 110s.

Ex "Ningchow"—Thotulagalla, 1b 110s; 2c 1b 106s; 1c 103s; 1b 116s. Ampittiakande, 1t 107s; 2c 105s; 1b 102s; 1b 120s.

Ex "Ningchow"—Queensberry, 1b 114s; 2c 113s; 3c 1b 107s 6d; 1b 103s 6d; 1c 131s.

Ex "Orizaba"—Elkadua, 1b 107s; 2c 1b 107s; 2b 98s 6d; 1b 106s.

Ex "Nestor"—Tainmurra, 4b 97s.

Ex "Port Denison"—Ouvah, 1c 1t 109s 6d; 2c 1t 105s 6d; 1b 99s; 1t 133s.

Ex "Ningchow"—Diyagama, 1t 110s; 3c 108s; 1t 104s; 1b 128s. Mahakands, 1b 109s; 1c 1b 110s; 1t 104s; 1b 133s. Ouvakellie, 1t 111s; 1c 1b 107s; 1t 104s; 1b 131s. Roehampton, 1b 108s; 3c 106s; 1c 102s 6d; 1t 127s.

Ex "City of Dundee"—Broughton, 1b 110s 6d; 3c 107s; 1b 103s; 1b 130s.

Ex "Port Dennison"—Bogawantalawa, 1b 111s; 5c 106s 6d; 1c 1b 106s 6d; 2c 104s; 1b 129s; 1c 127s. Aldourie, 1t 112s; 3c 1b 107s; 1t 104s; 1t 132s. Braemore, 1b 103s; 1t 108s; 1b 106s; 1c 104s; 1b 101s; 1b 1c 96s 6d; 1b 95s; 1b 108s; 1c 107s; 3c 1t 104s 6d; 1b 100s; 1b 108s,

Ex "Clan Macintosh"—RWA, 4c 1b 105s 6d; 1b 100s.

Ex "Ningchow"—Louisa, 1b 114s; 1b 103s. Elbedde 1b 117s; 1b 1c 111s; 1b 101s; 1b 102s.

Ex "City of Dundee"—Katahoola, 1c 114s; 2c 107s 6d; 1b 103s; 1b 131s.

CEYLON COCOA SALES IN LONDON.

(*From Wilson, Smithett, & Co's. Circular.*)

MINCING LANE, April 24th, 1891.

Ex "Scindia"—(DHK), 21b 125s; 1b 85s.

Ex "Ping Suey"—Palli, 6b 85s; 3b 91s; 2b 85s 4d; 3b 91s.

Ex "Falls of Inversnaid"—Goonambil, 21b 120s; 1b 67s; 11b 123s; 12b 120s; 5b 70s; 2b 60s; 66b 105s.

Ex "Gaekwar"—Gangwarily, 2b 56s.

MINCING LANE, May 1st, 1891.

Ex 'Electrician"—North Matale, 26 bags 132s; 9b 90s 6d; 11b 86s; 8b 83s; 10b 67s. Alloowihara, 11 bags 122s 6d; 2b 90s 6d; 8b 86s; 2b 83s; 9b 67s.

Ex "City of Dundee"—Kepitigalla, 20 bags 102s; 4b 65s.

Ex "Orizaba"—Lower Haloya, 11 bags 102s 6d 3b 48s; 2b 36s.

Ex "City of Dundee"—Warriapolla, 130 bags 122; 15b 72s; 4b 47s; 3b 92s 6d. Sudugange, 94 bags 121s; 13b 72s; 5b 52s 6d; 3b 92s 6d.

Ex "Clan Sinclair"—Ravenscraig, 1 case 100.

Ex "Clan Buchanan"—Walton cocoa, 16 bags 106s; 2b 63s.

Ex "Ping Suey"—Pondappa, 10 bags 113s; 31b 110s.

Ex "City of Dundee"—Delgolla, 46 bags 103s; 9b 71s 6d; 2b 72s 6d.

Ex "Scindia Blight"—OBEC, 2 bags 51s 6d.

Ex "Pak Ling"—OBEC, 2 bags 51s; 4b 64s.

CEYLON CARDAMOM SALES IN LONDON.

(*From Our Commercial Correspondent.*)

MINCING LANE, May 1st, 1891.

Ex "Ping Suey"—Lemagastenne, 4 cases 1s 7d; 3c 1s 8d; 2c 1s 4d; 5c 1s 5d; 1c 1s 10d. Yattewatte, 4 cases 1s 6d; 1c 1s 10d.

Ex "Gaekwar"—Galaha, 1 case 4s 2d; 3c 3s 11d; 1c 2s 6d; 1c 1s 6d; 3c 1s 8d. Kitoolmoola, 1 case 4s 4d; 3c 4s 11d; 1c 2s 4d; 3c 1s 8d; 2c 1s 10d. Katooloya, 3 cases 2s 3d; 2c 1s 8d; 2c 1s 6d; 3c 1s 5d.

Ex "Ningchow,"—(JG) R, 1c 1s 10d; 3c 1s 11d; 5c 2s.

Ex "Port Augusta"—Old Madegama, 2 cases 2s 3d; 1c 2s; 1c 1s 9d.

"CEYLON OBSERVER" PRESS, COLOMBO.

Supplement to This Day's Issue.

EXTRACTS FROM THE REPORT

OF THE

DIRECTOR OF THE CEYLON BOTANIC GARDENS, 1890.

Cultivation.—For some time past I have been desirous to show to greater advantage various attractive climbing or twining plants of moderate size, which are soon lost to sight if planted out amid the general mass of vegetation ; and in the early part of the year I erected near the conservatory five domed trellis-work frames for their support. These are 8 ft. in height by 6 ft. wide, composed wholly of iron rods and wire net, and each accommodates six creepers. For the most part these plants have done well, and a good display of flowers kept up.

Among the plants which have flowered in Péradeniya for the first time during 1890, the following may be noted :—*Impatiens Hawkeri*, *Lysidice rhodostegia*, *Eucalyptus alba*, *Kalanchoe carnea*, *Grias cauliflora*, *Mouriria guianensis*, *Oxyanthus natalensis*, *Gardenia Thunbergia*, *Ardisia Oliveri*, *Payena Leerii*, *Araujia grandiflora*, *Solanum pensile*, *Odontadenia Harrisii* (= *Bignonia regalis*, Bull), *Jacaranda mimosæfolia*, *Thunbergia affinis*, *Æchmea Weilbachii*, *Costus mosaicus*, *Zingiber corallinum*, *Eucharis Sanderi*, *Griffinia hyacinthina*, *Erythrotis Beddomii*, *Anthurium Rothschildianum* ; and of orchids :—*Burlingtonia candida*, *Saccolabium giganteum*, *Epidendrum vitellinum*, *Pleione humilis*, *Cattleya Lawrenceana*, *C. velutina*, *C. Percivaliana*, *Vanda gigantea*, *Chysis bractescens*, *Cypripedium Argus*, *C. Lawrenceanum*, *C. Roezlii*, *C. Spicerianum*, *C. Sedeni* var. *candidulum*, *Dendrobium crassinode*, *D. undulatum*, *Oncidium flexuosum*, *O. reflexum*, *Phalænopsis rosea*, *Bifrenaria Hamiltoniæ*, *Brassia maculata*, *Stanhopea graveolens*, *Miltonia Clowesii*, *Gongora (Acropera)* sp., *Acineta Humboldtii*, *Cœlogyne speciosa*.

The first flowering also of the coco-de-mer palm (*Lodoicea sechellarum*) requires special notice here. The tree is in its fortieth year, and examination of the immature flowers shows it to be a male. The inflorescence appeared at the end of June, being put forth from the stem between the halves of the split base of one of the leaf-stalks. I regret to say that it never got beyond the bud stage, some mischievous person having cut off the whole inflorescence soon after its appearance. We may however now expect the production of flowers each year.

A fine talipot palm came into flower in the middle of November, and is in full blossom at the end of the year. I believe this tree to be in its fiftieth year.

Race-course Ground.—This piece of Crown land is immediately opposite the Garden frontage, and has lain waste for many years. Since the foundation of the Gardens it has always been more or less under our control, and since 1886 it has been placed under my general care in the interest of the Kandy Race Committee. But I have never possessed any funds for its improvement.

At the end of 1888 the proprietors of the adjoining tea estate applied for a lease of the land for extending their plantation, and the matter was referred to me. I recommended that the portion out of sight of the road should be so leased, but that the remainder forming the frontage to the high road should remain under my charge. This was done, and about eighteen acres remain so reserved. The small sum received as rent is also handed over to me towards the upkeep, and with this I have cleared the land and levelled it. A hedge of dwarf bamboo has been planted along the whole front, and for the present I contemplate keeping the whole under turf. The abolition of this wilderness of weeds close to our bounds has much improved the appearance of the entrance to the Gardens.

Visitors.—The book kept at the Lodge shows that 1,454 persons signed their names during the year. These are almost wholly visitors from home or from foreign countries, residents in the Colony not being asked to sign.

New Edition of Hand-Guide.—The second edition of this little book having run out, I prepared a third, considerably enlarged and brought up to date. Though printed in January this was not actually published till June, the delay having been caused by the time required for the production of an excellent new plan of the Garden printed in colours at the Surveyor-General's Office.

Weather.—The rainfall for the year was only slightly under average, yet the usual monsoons were not well-marked, and there was remarkable deficiency in the usually very wet months of May and October. On the other hand, January and February were much more rainy than usual, and April and September slightly so, whilst the fall in November greatly exceeded the average. Though we experienced a sharp thunderstorm with rain from the south-west on April 4, the regular south-west rains did not set in till June 11 ; and the north-east monsoon was not evident till the heavy rains of the middle of November.

The following is the record for the year 1890, with averages for the past seven to eight years :—

Rainfall at Péradeniya.

	1890.		Average.		
	Rainfall.	Rainy Days.	Rainfall.	Rainy Days.	
January	3·61	7	1·86	4	for 7 years 1884–90
February	4·85	8	1·43	4	
March	1·95	7	3·59	8	
April	10·94	18	9·48	13	
May	4·17	7	7·67	12	
June	8·79	17	9·94	20	
July	8·24	18	7·66	16	for 8 years 1883–90
August	3·36	13	6·62	15	
September	8·47	16	7·83	14	
October	6·30	19	11·21	18	
November	12·75	19	9·96	17	
December	8·75	9	7·92	11	
Year ...	82·18	158	84·99	149	for 7 years 1884–90

The heaviest fall in any twenty-four hours recorded was 3·34 in., which fell on December 4.

2.—*Hakgala Garden.*

I give below, as usual, copious extracts from Mr. Nock's report of the work carried on during the year. Every attempt is made to keep the Garden up to a good level, but to do this thoroughly and pay full justice to the numerous and varied kinds of plants now grown require a larger expenditure than our limited means allow. The character of the Garden, its situation, and climate, render its upkeep an expensive matter, and I hope that it may soon be found possible to grant a somewhat more liberal vote for its maintenance, and so enable us to carry out more perfectly the objects of this useful and attractive institution.

A few improvements require special remark. The design of relieving the conservatory from having to do duty also as a propagating house has been partially met by the erection of a building for the purpose, as described below ; and a larger house with a similar object will be put up during the coming year.

I am glad to report that the Officer of the Public Works Department has submitted a plan and estimate for the restoration and improvement of the storage reservoir for the supply of water to the Garden, and that these being approved, work is to be commenced immediately.

The picturesque appearance of the lower pond having become impaired by serious leakage through the bund and retaining wall, which caused the level of the water to be often much below the spill, repairs have been effected and the level restored.

A further portion of the old carriage drive has been remade, and another piece will be taken in hand shortly. Nothing is more required at Hakgala than the improvement of this badly-traced, irregular, and uneven road.

The only very unsightly building now remaining on the grounds is the thatched shed for visitors' carriages. This is in a dilapidated state and not worth further repair, and ought to be superseded by a more permanent and ornamental structure.

The following extracts are from the Superintendent's report for the year :—

Fernery.—A great deal of work has been done in the fernery, and this took up the greater part of the labour for two months. It was found that the jungle shade trees had thoroughly exhausted the soil. Some of the beds were literally one mass of entangled roots, and the ferns and begonias could not hold their own among them. The beds and borders were taken one by one, and nearly all the plants were lifted. The ground was deeply dug over and the roots removed, and a large addition of fresh soil made, composed of leaf mould, old silt from the lower pond, a little manure, and the decomposed portions of the rubbish holes. To show the heavy nature of this work I may mention that no less than 20 cartloads of roots were removed, and 60 cartloads of leafmould, silt, &c., were used in remaking the beds, 8,500 ferns were replanted in them, and the duplicates were planted under the trees near by.

After this was done a liberal dressing of lime was sprinkled all over the surface of the soil and pointed in. The little paths here are in bad repair, but it is intended to put them in order soon.

It would greatly add to the beauty of the fernery if the undergrowth of the surrounding jungle was cut away, but with our present supply of labour we are unable to find time for this.

In August a bed was made at the top of the fernery for the comparatively rare and striking red balsam, *Impatiens Walkeri*. Plants of this curious species were brought from the Ramboda district, and 76 set out in the bed, where they are now doing well.

Plant Sheds and Nurseries.—A large stock of useful and ornamental plants has been kept up, both for distribution and for the use of the Garden, but a good deal of this work is disappointing. There is but little demand for plants, yet a certain amount of stock must be kept up in case it is asked for ; thus a great number of plants soon grow out of hand and have to be thrown away, as the vote allowed for the Garden is not sufficient to enable us to prepare land and plant out any large quantity of duplicate plants. For instance, we have now between 2,000 and 3,000 young oaks growing well in nursery beds, and the number is quite enough to form a respectable plantation as a trial. It was hoped to plant them out on the patana land above the Garden, but it has been found impossible to spare the labour necessary to prepare the land for them, which, if done at all, ought to be done well. This is only one instance of many, and it seems a pity that the trouble and labour, as in this case, of several years' attention should have to be wasted.

There were 487 pans of seeds sown, 49,400 seedling plants were pricked out or transplanted, 89,950 cuttings were put in in nursery and propagating house, and 6,372 plants were potted. Several beds of seeds were sown in the nursery, and some annuals in the open borders.

Borders, Shrubberies, &c.—54,500 plants of ornamental trees and shrubs and garden plants and annuals were set out during the year in beds, borders, and shrubberies, the majority of course being herbaceous plants and annuals ; and several new borders have been made.

The rough and unsightly plot of ground immediately above the plant sheds was taken in hand in the early months of the year. The lower part was levelled to give room for the new propagating pit, and the low rough bank above was made even and turfed.

All the undergrowth weeds and rubbish were cleared away from the plot of land below the herbaceous garden, and during the rains in August 17,300 roots of *Paspalum conjugatum* were planted out in it. These are now growing well and will, it is hoped, soon form a nice green carpet.

To the north of this a piece of land has been set off to form a rubbish and soil yard. The site is conveniently suited for this purpose, but it will be necessary to hide it from view by a high hedge. This piece of land has five sides, and in order to give a trial to several plants a different kind has been planted on each side. The following plants and cuttings were put in:—*Frenela rhomboidea*, English oak, *Cryptomeria japonica*, *Duranta Plumieri*, and *Pittosporum undulatum*. All have made a good start, and appear likely to answer the purpose well.

Between the entrance to the fernery and the steps leading up to the office, a retaining wall, 71 ft. long and 3 ft. high, was built, to do away with the uneven crumbling bank that existed there. Sedums, Echeverias, Begonias, and other plants have been planted in the joints between the stones. This now forms a pretty bank. The border made at the top of this bank is planted with a line of *Cineraria maritima*, in a serpentine fashion, to form twenty-four spaces. The spaces in front are planted with different sorts of verbenas, and those at the back with varieties of geraniums. A row of golden feather is planted in front, and between this and at the top of the wall five kinds of ivy-leaf geranium.

A row of box, 65 ft. long, has been planted on the west side of the carriage turn at the end of the flower garden. The plants are growing well and bid fair to make a good hedge.

Along the lower side of the carriage drive from the corner of the new pond to the entrance gate plants of *Cupressus macrocarpa* have been planted out 12 ft. apart. These are intended to form an avenue to replace the scrubby-looking casuarinas now growing there.

During the dry months, when the water in the lower pond was very low, the opportunity was taken of cleaning out a quantity of silt and to make another attempt to stop the leaks. A large trench was cut across the main road to allow the leaking water to escape, and another trench was opened at the back of the retaining wall to the depth of the leaks. This was then filled in with tempered clay, well rammed. The cracked joints in the face of the wall were cleaned out and filled in with cement concrete. This so far has answered well, and I trust will be a permanent success.

When heavy falls of rain come the rush of water flushes over the edging and has several times caused great damage to the drive. To prevent this another course of bricks is required, which would turn the water to the mouth of the outlet.

Turf verges, measuring 430 running yards, twelve inches wide, have been laid down along the sides of the new paths and the part of drive which was remade. 1,020 square yards of turf were laid down on banks and in flower garden.

Flower Garden.—As the turf in the flower garden had become uneven and the beds more or less out of shape, it was found necessary to rearrange the whole. All the turf was taken off and the ground levelled and returfed. It was then carefully rolled once a day (a handy iron roller being kindly lent by Mrs. Baker of Nuwara Eliya for this purpose) until it had begun to grow freely, when a new design of twenty-nine beds was cut out in it. These beds were thoroughly prepared and raised to the proper level, and in December were all planted with various showy plants.

Rose Garden.—The rose plants have done very much better this year. Towards the middle of August all the plants were pruned down close. The soil was removed down to the roots, and those that were too low were lifted up and fresh soil placed among and over the roots. A good dressing of leafmould and ashes, with six cart-loads of well-decomposed manure, was then laid on the surface and pointed in. After this treatment they began to grow freely and towards the end of September they were in good bloom. No less a quantity than 4,320 buds and expanded blooms, in 87 varieties, were counted on the 171 plants on September 30, one plant of Lamarque having 675 on it. There was also a good show of roses in the early part of June, 76 varieties being out at the same time, and the blooms were of good colour and substance.

Herbaceous Garden.—This garden has received a good deal of attention in the way of supplies and additions, manuring, and general cleaning up. A good many interesting plants have flowered during the year. I may mention especially a plant of *Eucomis undulata*, about five years old, which threw up a remarkably healthy flower spike bearing a head of forty-eight flowers, all being expanded at the same time. The umbel of flowers measured 2 ft. 6 in. across, the flowers, which are well spread out, bright pink in colour, being borne on stiff peduncles 1 ft. long.

The wedding flower, *Moræa Robinsoniana*, was in flower for several months. This handsome plant was also in bloom at the Horton Plains resthouse garden during the months of November and December.

Cyphomandra fragrans has proved a very handsome flowering plant, and continues in flower a long time through May, June, July, and August. The bunches of flowers, 6 to 8 in. long, hang down from almost every joint, and give a very pretty effect. The Flame tree, *Sterculia acerifolia*, flowered well here this year for the first time. During the end of April and all through May it was quite covered with its brilliant red flowers. A good many pods of seed have set, and they are now ripening up.

May this year was remarkable for the great number of flowers produced. On one day, the 16th, we counted no less than 610 distinct species and varieties in flower—50 distinct varieties of roses were in bloom together, and the bloom on some of the kinds might have been counted by hundreds.

Elk, Hares, and Porcupines.—These animals have done considerable damage during the year, especially the porcupines. These have pretty well cleared out all the *Lilium* tubers from the body of the garden. The hares have been most destructive to African marigolds, carnations, verbenas, and Phlox Drummondi; while the elk have turned their attention to the succulent leaves of Arthropodium and other liliaceous plants, and the tops of the tree Fuchsia, Habrothamnus, and Stillingia. They have also barked many plants of Pinus and other trees, which have died from the effects.

Influenza Epidemic.—Nearly every person belonging to the Gardens suffered from this in April. This caused the labour supply to be very irregular during that month, and much time was lost. The time the sickness lasted in different individuals varied from three days to three weeks.

Cattle Disease—This was very bad in this locality in April and May. Seven of the cattle here were very seriously affected and four died.

Visitors.—The number of visitors during the year was 1,319, being an increase of 134 over that of last year The greatest number in any month was 154 in December (against 194 in January of last year). The lowest was 46 in June against 31 in June the year before.

The number of tourists has greatly increased, and the Garden is now visited by persons from all parts of the world.

Weather.—The weather during the year was remarkable for its short rainfall and for very light monsoons, both as regards wind and rain.

Permission was granted by the Hon. the Surveyor-General to remove the anemometer and wind vane to a more convenient site, which has presented itself since the Gardens have been opened out, at a distance of not more than one hundred yards from the office. This was done on the last day of June after seven years' observations, which give a good average, of the direction and force of the wind which passes over the Garden. The new site, though not so exposed as the old one on the patana, is one of the windiest places in the Garden, and will be a very fair test of the force of the wind which passes through.

The total rainfall for the year was 70·97 in., which fell on 172 days, being 16·55 in. short of the average of six years, and of rainy days less by 10.

Below I give the usual table showing the monthly rainfall and averages from July, 1883, to the end of 1890, and the number of days on which rain fell during the nine years, 1882-90 :—

		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1890 ...	Rainfall...	6·34	4·47	·88	15·91	3·98	4·78	4·75	4·16	3·52	5·98	8·97	7·23	70·97
	Days ...	14	11	8	20	8	11	14	19	15	19	18	15	172
1889 ...	Rainfall...	7·25	1·55	7·06	12·21	15·01	4·55	8·50	4·02	10·37	4·25	7·69	5·88	88·34
	Days ...	10	3	15	20	18	16	20	14	20	10	16	18	180
1888 ...	Rainfall...	·26	0	5·11	9·84	8·79	15·53	·96	2·03	6·96	10·04	11·62	18·93	90·07
	Days ...	4	0	11	16	28	23	8	11	14	19	22	19	175
1887 ...	Rainfall...	4·89	3·67	1·21	7·48	8·20	4·45	5·05	3·32	6·43	10·04	13·40	33·77	101·91
	Days ...	16	11	7	19	17	27	16	15	20	24	23	29	224
1886 ...	Rainfall...	11·30	2·66	3·28	3·43	9·13	7·60	8·18	8·45	6·79	9·61	6·97	9·03	86·43
	Days ...	21	9	9	15	18	17	24	19	20	21	18	20	211
1885 ...	Rainfall...	5·56	2·42	3·12	4·16	8·52	15·57	4·77	3·47	3·21	10·60	8·03	12·71	83·14
	Days ...	24	5	12	12	19	26	18	11	14	26	23	25	215
1884 ...	Rainfall...	4·67	1·85	3·90	3·02	4·48	2·23	3·09	4·33	8·32	14·07	9·81	15·47	75·24
	Days ...	17	7	9	12	12	11	17	22	20	25	19	25	196
1883 ...	Rainfall...	—	—	—	—	—	—	11·96	7·96	3·27	6·80	9·24	7·83	47·06
	Days ...	22	11	8	18	18	23	22	25	14	22	24	19	226
1882 ...	Days ...	10	16	6	12	15	18	31	31	27	27	20	22	235
Average Days ...		15	8	9	16	17	19	19	18	18	21	20	21	204*
Average Rainfall...		5·75	2·37	3·51	8·0	8·30	7·81	5·04	4·25	6·51	9·23	9·50	14·71	85·14†

* Average of nine years. † Average of seven years.

The greatest pressure of the wind occurred on June 19, when 3,808 lb. per square foot was registered, being equal to 27·60 miles an hour. This was very low compared with the highest pressure last year, which was 7·372 lb., equal to 38·40 miles an hour, on June 1.

The mean daily horizontal movement of the air for the year was 145·41 miles, against 205·26 miles last year.

The windiest month was June, with a mean daily horizontal movement of 384·37 miles, against 467·24 miles of June last year.

The calmest month was December, with a mean of only 33·51 miles, against 92·1 miles in February the year before. This may be due to the change of the site of the anemometer, and February may really be the calmest month.

The barometic pressure and temperature of the air for the year are given in the following table :—

Barometic Pressure (5,581 ft. elevation).			*Temperature of the Air.*		
1890.	Mean.	Range.	1890.	Mean.	Range.
January ...	24·536 ...	·192	January ...	60·1 ...	27·6
February ...	24·573 ...	·273	February ...	61·0 ...	29·8
March ...	24·553 ...	·199	March ...	64 5 ...	30 2
April ...	24·537 ...	·203	April ...	64·9 ...	27·1
May ...	24·507 ...	·192	May ...	66·2 ...	26·0
June ...	24·469 ...	·222	June ...	63·3 ...	23 0
July ...	24·501 ...	·158	July ...	62·0 ...	21·0
August ...	24·507 ...	·148	August ...	62·3 ...	25·4
September ...	24·507 ...	·233	September ...	61·7 ...	24·0
October ...	24·516 ...	·232	October ...	61·2 ...	22·0
November ...	24·581 ...	·199	November ...	61·1 ...	18·2
December ...	24·583 ...	·217	December ...	58·6 ...	24·0
The 12 months ...	24·530 ...	·367	The 12 months ...	62·3 ...	38·2
Highest reading	24·716, on February 3.		Maximum temperature of air, 78·2, on May 12.		
Lowest reading	24·349, on June 10.		Minimum temperature of air, 40·0, on Dec. 23.		

The highest temperature in the sun's rays during the year was 149·0 on May 10, against 154·0 on March 10 last year.

The lowest on grass was 36·5 on February 18, against 37·0 on December 31 of the year before.

The mean amount of cloud was 6·6, against 6·8 last year. The cloudiest month this year was April, with a mean of 7·5, January and November coming next with 7·2. The brightest month was, as usual, February, with a mean of 6·0. This is nearly double what it was last year, viz., 3·9.

3.—*Henaratgoda Garden.*

The rainfall, though moderate, falling on only 96 days, was well distributed over the year From the commencement of 1891 rainfall records will be kept at the Garden, a gauge having been provided by the Public Works Department.

The condition of this little Garden continues to be very satisfactory, and the various plants are for the most part in good health. A considerable improvement has been effected at the entrance, by clearing the land on the left so as to form a lawn, which has been planted up with palms and ornamental trees.

The plant conservatory has been much improved by the substitution of coir netting for the tiles which formerly covered the roof.

The Garden well has been replanked, and a pump fixed to take the place of the buckets hitherto in use.

I am glad to observe that this interesting Garden has been somewhat more frequented this year. As many as 90 visitors have entered their names in the book kept there, and not a few have added remarks showing their appreciation of the place and of the intelligence of the Muhandiram in charge. The little shelter put up for the convenience of visitors has been re-thatched and whitewashed.

Among the Economic Notes below will be found information as to experiments carried on here with Para Rubber, Gambier, &c.

4.—*Anurádhapura Garden.*

The difficulty of obtaining sufficient water continues, but in this we suffer along with the whole community of cultivators in the place. The scanty rainfall in the catchment area of Kalawewa has kept Tissa tank very low (there were about 5 ft. of water at the end of the year), and we get water only on one day in every two or three weeks. The alteration in our means of supply referred to in my last report has indeed been carried out by the Public Works Officer, and the improvement is considerable, but the ela we take from is too low, and we need a supply from some higher point. Tissa tank itself would be the best, but whilst it continues to be so empty this would be impossible.

A terribly dry year has been again experienced, only 40·77 in. in all, and of this 18·02 in. fell in one month. As in last year, this wet month was again April. During the next five months only 2·69 in. fell, and by the end of September the condition of the Garden was pitiable: not a blade of grass to be seen, and the larger plants dead and dying. A good fall of 6·27 in. occurred, however, in November, and though the usually heavy rain of December was represented by only 4·36 in., yet by the end of the year things had much improved.

It is indeed remarkable how comparatively well some trees stand the drought which would have been expected to fail to do so. Thus the breadfruit ripened last year, and good plantains of the *kólikuttu* variety were abundant. The only bamboo of those tried that seems likely to succeed is the male bamboo *(Dendrocalamus strictus)*.

This Garden rarely has a visitor, but it is becoming a very pretty spot, and the show of flowering shrubs and trees a fairly good one.

5.—*Badulla Garden.*

Much has been effected here during the year, and at length this Garden is beginning to be an attractive place. Considering that it was planted only so recently as 1886, I am very well satisfied with the progress made.

The season of 1890 has been favourable: a good rainfall—the exact amount of which cannot be given owing to want of records for April—well distributed through the year, has kept up a steady growth, only checked by the dry weather in July to September, and even this was less marked than usual. Heavy rains occurred in January and April and in October and November.

The great improvement of the year, however, has been the provision of a constant water supply instead of the uncertain and intermittent one upon which we had formerly to rely. As was arranged (see my last report), the ornamental lake in the centre of the race-course is fed by a channel which is carried through the Garden, and in its course there fills a small reservoir. This was constructed in April, and is 20 ft. by 9 ft. and 4 ft. deep; it keeps constantly full. The channel cuts the main drive and three smaller paths, and under these culverts have been built. All this work has been done, without cost to my Department, by the Public Works Department and under the eye of the Government Agent, Mr. Fisher, to whom my thanks are due for the active interest he has constantly shown in the progress of the Garden.

Some alterations have been made at the western side of the Garden, where a narrow strip of land adjoining the Mohammedan burial ground, on the north side of the road of approach to the Garden entrance, has been taken in and fenced off with a good hedge of Madras thorn. This faces a similar narrow strip on the opposite side of the road, and an avenue of trees *(Castanospermum australe)* has been planted on either side. It will be necessary to remove the gates from their present position so as to include this avenue within the Garden bounds.

The supply of manure from the town, thirty cartloads a month, was intermittent during the early part of the year owing to the cattle murrain, but has since been steadily kept up. This is a great advantage to the Garden, and its use has had a very marked effect on this old paddy land. I think, too, that the larger trees and shrubs have now got through the exhausted upper layer of soil, and are beginning to get the benefit of the untouched lower strata. Certainly their growth is now stronger and healthier than at any previous time. Some of the young trees of *Cedrela odorata* are already 2 ft. in girth at the base and 16½ in. at a yard from the ground. Our chief trouble now is the vast abundance of white ants, and these are specially destructive in the nurseries.

The unsightly little dwelling of the Conductor was hurriedly put up at the commencement of the Garden, and is badly placed and unhealthy. As two of his children have suffered here from typhoid, I have recommended that a new and better house in a different position may be built for the Conductor, and I trust this may be done during ths coming year. The other wants of the Garden are a permanent conservatory for pot plants, better cooly lines, and the proper metalling and drainage of the main drive. Some or all of these I hope soon to supply.

6.—*Interchange of Plants and Seeds.*

Our exchanges with other Botanical establishments have been less active during the past year than in any previous one of my occupancy; and it is obvious that such a time must at length arrive. Not only do we, as gradually year by year our desiderata are supplied, find that there is less and less to be got, but, at the same time, as we supply other Gardens with their wants we find our resources becoming exhausted, since we have less and less to offer that they require. Indeed, I now find that the receipts from other Botanic Gardens consist principally of things which we have already here.

During 1890 we received in exchange only six Wardian cases and five boxes of plants. They were from the following:—The Royal Gardens, Kew (two cases, two boxes); the Botanic Gardens

of Singapore (one case, two boxes), Calcutta (one case), and Mauritius (one box); and Messrs. F. Sander & Co., St. Alban's (two cases).

Packets of seeds have been received from the Botanic Gardens at Kew, Calcutta, Darjiling Madras, Penang, Buitenzorg, Melbourne, Port Darwin (N. Australia), Hongkong, Jamaica, and Trinidad; from the Acclimatization Society of Queensland; and from Mr. J. Gammie, Bengal; Baron von Mueller, Melbourne; and Messrs. Reasoner, Florida.

The following residents in Ceylon are also to be thanked for exchanges or donations of plants and seeds:—Lady Havelock, Mrs. Baker, Miss Booth, Mrs. N. G. Campbell, Mrs. Wickwar; and Messrs. T. Farr, J. Ferguson, J. Fraser, T. C. Huxley, A. J. Kellow, A. C. Lawrie, F. Mackwood, J. Morris, C. Palliser, E. J. Thwaites, G. Wall, W. R. Waller, A. Whyte, and W. G. Wood.

The Gardens in exchange have sent out during the year eight Wardian cases and ten boxes of living plants to the following:—To the Royal Gardens, Kew (three cases, two boxes); to the Botanic Gardens, Calcutta (two cases), Singapore (two cases, one box), Glasgow (one box), and Cambridge (one box); to Messrs. Bull, Chelsea (one case and several packages); Messrs. Veitch, Chelsea (two boxes); Messrs. Sander, St. Alban's (two boxes); and Mr. Griffith, Nilgiris (one box).

Packets of seeds have been despatched to the Botanic Gardens at Kew, Paris, Cambridge, Calcutta, Singapore, Hongkong, Mauritius, Trinidad, and British Guiana; also to Messrs. Bull, Chelsea, and Mr. Wilson, Soerabaya, Java.

The usual gratis distribution of plants and seeds of useful or ornamental character has been made on application to the following public places and persons in the Colony:—Queen's House, Colombo; Pavilion, Kandy; Queen's Cottage, Nuwara Eliya; the Government Agents of Kandy and Badulla; the Assistant Agents of Mátalé, Nuwara Eliya and Kẹgalla; the Mayor of Colombo; the District Engineers at Katugastota, Mihintalé, and Maradankadawala; the Forest Officers at Ratnapura and Nuwara Eliya; the Police Stations at Haldummulla and Rágalla; the Hospital grounds at Kandy, Matalé, Lindula, Kẹlẹbokka and Nuwara Eliya; the Station gardens at Gampola, Watawala, Watagoda, and Katukurunda; the Post Office compounds at Nuwara Eliya and Uda Pussẹllawa, and the Resthouse, Horton Plains.

7.—*Additions to the Collections.*

For the reason given in the last section, our list this year is not a large one. There are however a few valuable additions; and there has been a considerable increase in our collection of orchids, which is wholly due to the liberality of Messrs. Sander, of St. Alban's, who have sent two valuable consignments of fine plants.

The vote for purchases of plants has been expended on a collection of roses from Messrs. Cannell, a selection of seeds of ornamental garden plants from Messrs. Carter, a collection of hardy ferns for Hakgala from Messrs. Veitch, and a variety of seeds and bulbs (also for Hakgala) from Messrs. Boehmer, of Yokohama, Japan.

8.—**Notes on Economic Plants.**

Tea.—It is not necessary for me to make any observations on this great and increasing cultivation, the excellent condition of which remains in all respects unchanged. The exports for the commercial year ending with September reached over 43¾ million (43,864,233) pounds, an increase of more than 11 million over the previous twelve months, whilst for the calendar year 1890 it was nearly 47 million (46,901,554) pounds, or nearly 13 million more than in 1889. The average price per pound for the year 1890 in the London market was 11*d.* It is encouraging to observe that the export to Australia (over 2½ million pounds) has nearly doubled; and that a direct export to America (over 204,000 pounds) has commenced. Over 75,000 lb. have also been shipped direct to the European continental ports of Hamburg and Bremen, and this it is hoped is but the beginning of far larger exports to these markets in the future.

Coffee.—Nor is there any occasion for me to do more than note, for comparison with previous years, the diminished export of this once leading product—90,104 cwt. for the commercial year, or 86,009 cwt. for 1890.

Cinchona Bark was exported to the amount of 8,686,243 lb. during the commercial year (8,728,836 for 1890). This is still a very large quantity, though the smallest since 1883. No revival of this cultivation in Ceylon has taken place, or seems likely to do so.

Cacao.—The Customs returns give the export for the commercial year as 18,268 cwt., a considrable increase over the previous year, and, it may be suspected, somewhat too high.* The

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* In the Report for the year 1890 of the Planters' Association Committee the exports of cacao are given as 15,942 cwt. only.

prices obtained in the home market have been excellent, comparing very favourably with those of Trinided and West Indian sorts, and the industry here may be considered to be in a satisfactory, and improving condition.

I am sorry to observe, that in spite of the encouragement given by Government, but slight progress has been made by the villagers in cultivating this valuable product. For many years past I have made a large gratis distribution of seed through the kachchéries of the Central and Sabaragamuwa Provinces; but the visible results seem so lamentably small, that I think it desirable to call attention to the matter. During the past eight years, 1883–90, I have distributed in this manner all the pods remaining after supplying purchasers. From Péradeniya have been supplied 14,823 pods, and from Henaratgoda 11,900; in all 26,723 pods, equivalent to fully 700,000 seeds, besides small quantities of plants. These have been sent to the kachchéries of Kandy, Ratnapura, Mátalé, and Kégalla for distribution, and the question cannot but suggest itself as to what has become of them all. I fear that there is good reason to believe that a considerable proportion has never really reached the poor villagers whom it is intended to benefit, and in this belief I have, during the past year, made a small gratis distribution directly to suitable applicants at the Gardens. I would suggest that this personal distribution, without the intervention of clerks or headmen, be carried out for the future on a larger scale, either at the kachchéries or the Gardens, as the only way of reaching the villagers.

A good deal of interest attaches to the question as to the *kinds* of cacao in cultivation here, and I may supplement the remarks I have made on this subject in previous reports by a few further observations. There is no reason to suppose that we have under cultivation more than one species of *Theobroma*, but every probability that all the varieties trace their origin to a common wild parent. It would be interesting to know which of the two fairly well-marked races recognised in Ceylon is the nearer to this original type, and the facts could probably be ascertained in Central America. The names "Criollo" and "Forastero" applied to them simply mean "wild and foreign," and seem to have had their origin in Trinidad, but it is doubtful if the former was ever really a native plant there. It was, however, the sort at one time exclusively grown in that island, where having died out its place was supplied by the "foreign" sort, no doubt obtained from the mainland.

As seen in Ceylon, the "Criollo" (called also here "Caracas" and "Old Ceylon Red Cacao") presents very little variety, but the "Forastero" shows a remarkable range in form, size, and colour of pod and seed. It was of this sort that the whole of the plants we received from Trinidad in 1880–81 consisted, though some were labelled "Criollo," and for a time led to some confusion. The small plantation formed of these at Péradeniya now consists of 33 trees, the remainder of the original 42 having been cut out, being inferior varieties, to avoid danger of crossing by them. Of these some are much better than others both in yield and quality, and about six or seven are obviously very superior. Three trees which have the fruit yellow when ripe, are especially good: these came labelled "Cayenne." Another, with a very dark metallic-looking fruit, bore the name "Cundeamar." But, as before remarked, I attach but little importance to these names, which are evidently applied in Trinidad very loosely.

No doubt crossing goes on freely in plantations even between the two main races, and it is well known here that seed from a single tree gives a very varied progeny; but a very curious remark has been recently made to me by a large grower, who has great opportunities for observation, that the "Forastero" varieties, which he chiefly cultivates, appear to be gradually changing their characters and becoming more like the "Old Ceylon Red," the seeds losing their dark colour on section and becoming pale or nearly white. It will be very interesting to observe whether these observations are confirmed by longer experience.

The excellent prices brought by our product in the home market has attracted serious attention in Trinidad, and at the request of His Excellency Sir W. Robinson, Governor of that Colony, I have recently afforded him some information as to the process of curing followed here, a portion of which, referring to the artificial drying of the beans, he has embodied in a useful paper he has communicated to the Trinidad "Agricultural Record."*

As regards the relative values of the two classes of cacao, I may refer to the remarks in my report for 1883. Further experience has however somewhat modified that estimate. The opinion of planters now is by no means unanimously in favour of the "Old Red Ceylon" sort, and in the market the two sorts are often very evenly priced. As an example, lots of both grown on the same estate and kept carefully separate were sold in London on the same day in March last: they fetched respectively, "Caracas," average 106*s.* $7\frac{3}{4}$*d.* and "Forastero," average 107*s.* per cwt.

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* I may here usefully refer to an excellent account of the preparation of cacao in Ceylon printed in the "Tropical Agriculturist" for December, 1890, p. 401.

Caoutchouc Trees.—Para Rubber (*Hevea brasiliensis*). The Forest Department has plante land at Edangoda, in Sabaragamuwa, with 9,000 seeds supplied from Henaratgoda at the end August. They germinated freely, but I understand that some of the land being subsequent flooded, many of the young seedlings were drowned. To supply these vacancies I prepared October several thousand "stumps" (the seeding time being past), but these, though applied fo were never fetched away. A very small commencement has thus at length been effected in tl cultivation by Government of this valuable tree, but it is to be hoped that it will be more vigorous carried onward, and that a very much larger area will be devoted to it, as on a large scale it mu prove highly remunerative.

That the yield of rubber is improving as our trees get older, is evidenced by a furth experiment made at Henaratgoda during the past year by the conductor. The tree selected was tl same one as was tapped in 1888, the results of which were recorded in my report for that year. Th is now 13 years old, and its stem girths 4 ft. 11 in. at a yard above ground. It was tapped on 1 days: on 7 in January and February, on 6 in July and August, and on 4 in November and Decen ber. The method followed was to smooth the surface by scraping off a little of the outer bark to a height easily reached, and then to make, with a $\frac{3}{4}$ in. chisel, numerous V-shaped incisions. A the foot of the trunk cocoanut cups were fastened with clay, and the milk conducted into them b little ridges of clay. Most of the milk, however, dried on the tree in tears. The tapping was do in the afternoon and the rubber collected in the morning.

From this tree (which yielded nearly 2 lb. in 1888) we obtained this year 2 lb. 10 oz. of goo dry rubber, partly in sheet but mostly in tears. The tree appears none the worse for the operatio and I consider the result very encouraging. The whole cost of collection was under a rupee, and course in operating on a large number of trees in a plantation this would be very greatly reduce

Our largest tree of Hevea is now 5 ft. $9\frac{3}{4}$ in. in circumference at a yard from the ground.

Ceara Rubber (*Manihot Glaziovii*).—Interest in this plant has of late years very much die away, the yield of rubber having been found too small to satisfy the planter's expectations. Thus have made no report on it since 1884. There are, however, considerable plantations on some estate and now that the trees are older it is found to be profitable to harvest the product. Several ship ments have been made to London during the past year, and have realised very good prices. Of cour the quantities have not been large: one shipment of 4 cwt. fetched 1*s.* $8\frac{1}{2}$*d.* to 1*s.* $9\frac{1}{2}$*d.* per lb. ne showing a profit here of about 37 cents (of a rupee) per lb. A planter estimates the cost collection at about 36 cents per lb., and reckons that trees of eight years old afford at least 3 o whilst some ten years old gave half a pound. The collection is done in a somewhat primitive wa during the dry season, January to March. After the outer flaky layers of bark have been peele off, the inner bark is pricked copiously; the tears of rubber which exude are allowed to dry o the tree and are picked off, the resulting product being quite like the "Ceara Scrap" of commerc but in smaller tears.

The present opinion of planters seems to be that this kind of rubber "pays to harvest, bu not to cultivate," and they are prepared to destroy their trees to get the crop. But even on suc a system (which has been also largely followed here with cinchona) extensive areas of bad soil coul surely be profitably occupied with this tree, so grown as to provide a crop annually ready for tapping

Of other caoutchouc trees I have nothing particular to report. *Castilloa* does not answe expectations as to growth; our largest tree now girths only 3 ft. $6\frac{1}{2}$ in.

Gutta Percha Trees.—One of our trees of *Payena Leerii* flowered for the first time i December at Péradeniya, and finally settled any doubt still felt as to the correct determination the "Gutta Sundek" of Perak. There is a good figure of this species in Dr. Burck's paper o Gutta Percha in the "Annales" of the Buitenzorg Garden, vol. V. The trees of this at Henaratgod are now 25 ft. high, and nearly a foot in circumference.

Gambier (Uncaria Gambier).—A Wardian case containing nineteen plants of this was receive from Singapore at the end of May; five were dead on arrival. Of the rest, three were planted ou at Péradeniya, where they have all gradually died, and eleven sent to Henaratgoda, where ther seemed a better chance of their surviving. At the end of the year there remained six plants living of which five are healthy, and likely to do well. The acquisition of this interesting plant is thus a last accomplished. It is however clearly very fastidious and difficult to propagate, but it ought t succeed in our hottest and wettest districts. Naturally an extensive climber, it is in cultivatio kept down by cutting so as to form a low bush of 5 or 6 ft. A good account of this produc will be found in the Kew "Bulletin" for October, 1889.

Cubebs (Piper Cubeba).—I am unable to report any further progress in my endeavours t obtain this plant, which still remains a *desideratum*. Recently a Java planter has been advertisin plants for sale, but I am not aware whether any have been received in Ceylon from him.

Kola Nut (*Sterculia* (*Cola*) *acuminata*).—This tree is commonly cultivated in Jamaica, here it ripens its seeds in September, growing well in places with a moderate rainfall up to at east 1,600 ft. of altitude. In answer to my request I received from the Botanic Garden there a ox containing 190 seeds, which have germinated well, and will, I hope, succeed. I shall be glad a stock of young plants, as the only two trees we possess (at Henaratgoda), though now seven ears old, have not as yet flowered. The Kew "Bulletin" for November, 1890, contains a full account this product.

Sisal Hemp (*Agave rigida*, var. *sisalana*).—Much interest has been recently taken in this bre plant in consequence of the very large and important industry developed in it at the Bahamas. s several applications about it have been made to me, I applied to the Director of Kew Gardens for pecimens, and in May received a box of plants from that establishment. These were planted out at éràdeniya in September, and are growing luxuriantly.

New Zealand Flax (*Phormium tenax*).—Mr. Nock sends the following note :—

Several inquiries were made about this fibre plant at the beginning of the year ; and in order to ascertain hat weight of leaves a single plant would give, one about eight years old was selected, which was growing in good il on the margin of a pond in the Garden. It produced 225 leaves, and these varied in length from three to eight et, and weighed 107 pounds. An acre, at this rate, reckoning the plants at 6 ft. apart, would produce the iormous yield of about 54 tons.

Nutmegs.—A rather large sale of seed has been made during the year at Péràdeniya, where ur grove of old trees continues to yield large crops throughout the year. Several planters in the w-country are now taking up this cultivation seriously. Judging from our experience here, it in scarcely fail to be a very profitable one when the trees once reach full bearing.

Chinese Ginger.—In my report for 1885 I recorded the receipt from Kew of the roots of the lant said to afford the familiar "preserved ginger" of commerce so largely exported from China, id remarked that it was clearly quite distinct from the ordinary ginger plant. As it has never iade any attempt to flower with us, it has been impossible to determine its name with any kind of ertainty, though it appeared to be a species of *Alpinia.* A few years ago, at the request of Mr. Ford f the Hongkong Botanic Garden, I sent a specimen to that Garden, and Mr. Ford now informs me iat it has flowered with him, and proves to be nothing but the common and well known *Alpinia alanga.* This, the "kaluwala" of the Sinhalese, is commonly grown in all native gardens, and owers here freely. On a comparison of the foliage of the two plants I can certainly see but very slight ifferences, the leaves of the Chinese ginger being merely somewhat shorter and broader, of a iicker texture, and darker in colour especially beneath. The rhizomes are identical, and both have ie taste well described by Roxburgh as a "mixture of pepper and ginger accompanied by some egree of bitterness." The Sinhalese use the rhizomes in native medicine, but never as a condiment. ccording to Hanbury and other writers this is also the "Java Galangal," or "Greater Galangal," f the London drug market, and the "Galanga major" of the old pharmacists. It is a little difficult believe that the "preserved ginger" of commerce is the produce of the same plant, especially s the rhizome has not the appearance of the commercial article ; and I cannot help suspecting ie possibility of a mistake having been made when originally sending the plant to Kew.*

Tuberous-rooted Vine (*Vitis Martinellii*).—This species of vine, native to Cochin-China, has een written of as affording a grape of good flavour. We obtained the plant in 1883 from Hongkong, nd during the past year it for the first time produced fruit at Henaratgoda in September. It in no ay answers to its reputation, being small, very slightly juicy, and, like most of our wild species, ith a harsh and bitter taste. In its present state it is quite useless as an edible fruit.

Fruit Garden at Hakgala.—Mr. Nock reports :—

During the early part of May a good many of the imported fruit trees started into active life after their long est, but, as was to be expected, the high winds which occurred soon after checked them, and the growth they made as not at all satisfactory. However, one plant of "Kentish Fillbasket" apple set twelve healthy fruit ; these, on ccount of the small size of the plant, were thinned out to five, all of which came to perfection. The largest easured nine inches in circumference, and was well-flavoured. "King of the Pippins" apple bore six ; four of hem ripened up and were excellent in flavour and colour. Two Morella cherry plants made very fair growth, and ach plant ripened a few fruit, as also did the raspberries. The figs, too, have grown well, and one kind, "White schia," has borne a quantity of very good flavoured fruit. None of the other imported plants look at all well, and ave remained dormant for many months.

The blackberry plants raised from English seeds have done very well. Several kinds have flowered, and one ort, *Rubus mucronatus*, has borne a quantity of good-sized well-flavoured fruit. One spike had on it 32 berries, and

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* In an article on the plant in the Kew "Bulletin" for January, 1891, however, I see that the determination is ccepted as correct.

most of them ripened. The largest berry measured two inches and three-eighths in circumference. This compar very favourably with the size of those usually grown in England, and being so productive there is no doubt th with good cultivation this sort at least will thrive well in the hills.

Two hundred and ninety-two scions of the large plum were grafted on to stocks of the small inferior kind and the greater part have taken well and will be soon ready for distribution.

Potato Cultivation at Hakgala.—Mr. Nock has forwarded the following valuable practic information :—

There is no doubt that potatoes can be grown very profitably in this locality, provided they are planted such a time as will enable them to make their growth during the dry weather. The main thing to be borne i mind is to plant them in rich, well-drained and well-prepared land, and to use good varieties and good sets. It best to use whole tubers of an average weight of from one and a half to two ounces, and not to cut them until the are being planted, at which time a little piece is sliced off. This is merely to assist them to decay as soon as possibl after the sprouts have taken good hold of the soil. It is time well spent to prepare the sets for planting by layin them out in a room exposed to the light, occasionally giving them a turn round. This causes the eyes to send ou strong sturdy sprouts, and when these are from one-half to one inch long they are in the best condition for plantin For all ordinary sorts the rows may be two feet apart and the sets one foot apart in the row. The very stron growing sorts may be allowed a little more room between the rows. When the sets are prepared as above describe they start into growth as soon as planted and show above the surface in about seven days. In a week or ten day more they will be fit for moulding up. From the time they begin to show above ground a sharp lookout must b kept after the black grub, which is very destructive, and has a special liking for young potato shoots. These mus be carefully sought for and killed by hand. I know of nothing else that is practicable, but the following mixtur is of some use :—Equal parts of soot, fresh lime, and sulphur lightly dusted about the shoots makes them distasteful as also does a mixture of one tablespoonful of soluble phenyle to two gallons of water. The mixture must be kep well agitated, and applied to the roots with a syringe or fine-rosed water-can.

The stems of the potatoes should not be earthed up more than six inches, as more would place the tubers to far out of the influence of the sun and air.

It may be interesting to give the results of a crop of three varieties which were planted here on August 2 and lifted on November 14—thus they were only in the ground 84 days. During that time 12·70 in. of rain wa registered. This fell on 47 days. On only 10 of these days did ·50 or more fall. On 27 days the amount registere was ·15 or less, so that this was just the sort of weather that suited them.

The tubers used were saved from the third crop grown in Ceylon, and were prepared and planted in the wa above described. The result was a beautiful even crop, both as regards shape and size, as follows :—

Chiswick Favourite.—From 48 sets the produce was 482 tubers, weighing 85 pounds. The twelve larges weighed 7 pounds and the largest single tuber, 11½ ounces.

Imperator.—From 48 sets of this sort 375 tubers were produced, weighing 75 pounds. The twelve larges weighed 8 pounds and the largest single tuber 12 ounces.

Adirondack.—From 48 sets the produce was 457 tubers, which weighed 65 pounds, the twelve largest pounds, and the largest tuber 11 ounces.

Every tuber of the two first-named was perfectly sound, but 15 of "Adirondack" were diseased ; all thes were taken from the bottom of the row, where the soil was a little damper. As this was the fourth crop grown her from the produce of imported sets, a little over two years ago, I think it proves that with careful selection an preparation of seed tubers the potato improves in this locality instead of deteriorating, as, I believe, is generall supposed.

Shantung Cabbage.—Mr. Nock reports from Hakgala :—

The seeds of the two varieties—white and green—of this vegetable, received from Kew this year, came u well and were carefully planted out, but nearly every one ran prematurely to seed—a circumstance which usuall occurs when plants are kept too dry or too crowded. As far as I am aware, the plants in question, however, wer subject to neither. The cold windy weather which prevailed during the early part of their growth is the onl cause I can suggest for this result.

9.—*Herbarium and Library.*

Ceylon Herbarium.—Considerable additions have been made during the year, and very numerous specimens laid into their places. I made two collecting tours, one to the Jaffna and Mannár Districts in February and another to Haputalé and Horton Plains in September. The former of these was very productive of interesting species, and afforded several additions to our flora. The coast-country between Punakari and Mannár has not been botanized effectively since 1781, when the Danish Missionary Koenig, from Tranquebar, who was a first-rate botanist, travelled along it collecting : I was so fortunate as to rediscover some of his finds, which had not since been collected in Ceylon.

From Mannár itself I have since also had the pleasure of receiving from Mr. M. S. Crawford, Assistant Government Agent, about 200 species carefully ticketed by him with the Tamil local names.

General Herbarium.—The only addition during the past year has been a valuable donation from Dr. King of the Royal Botanic Gardens, Calcutta, consisting of 405 sheets of mounted and named duplicates from the herbarium there.

It is much to be wished that the specimens in the General Herbarium should be mounted n paper like those of the Ceylon collection, but this would be a very long and laborious piece of ork, and I see no chance of my finding time to undertake it.

The Draughtsman has added to the fine series of drawings forty-six finished botanical figures f Ceylon plants and twenty-six of cultivated orchids during the year.

Handbook to the Ceylon Flora.—Ever since the commencement of my residence in Ceylon have kept before me the production of a book which shall not only give a systematic and complete ccount of all the plants of the Island, but also enable residents and others who possess the neces- ary knowledge of the structure of flowers and of botanical terminology to ascertain the name of ny plant met with, and so be in a position to learn all that is known about it.

Every day's experience shows me that such a book is much needed here, and as time and pportunity have served I have brought together much of the material necessary for its production. During the past year I have made some solid progress, but it will be readily understood that to vork out and describe accurately the members of a flora of the size of that of Ceylon, comprising t the least 3,000 species, requires a very great deal of time, and more freedom from interruption han I can command. It also needs, to secure accuracy in references and nomenclature, access o many books and authentic specimens which I cannot consult here. It is therefore not possible or me to promise any very speedy completion of the work, but it is steadily progressing.

It is right for me to acknowledge here that much of the work has been done for me in the ast by my predecessors Gardner and Thwaites. The "Enumeratio" of the latter is a first-rate ook, but it is now twenty-seven years since it was completed, and it is out of print. It is moreover a urely scientific work, and contains no descriptions beyond brief ones in Latin of the species then ew to science, and is thus of little use to any one but a professed botanist. My task is also endered much more easy by the existence of the "Flora of British India," a book of immense alue and vast scope, commenced in 1872 and now rapidly approaching completion. Its extensive ange includes Ceylon; and all our species find their place in it, but of course interculated amongst heir allies from the Indian and Malayan Peninsulas, Afghanistan, the Himalayas, and Burma. Upon this great work my smaller effort must necessarily be largely based, but I purpose to give a nuch fuller treatment of, at all events, the more important plants than has been possible in a reatise which had perforce to be restricted to the briefest description.

In connection with this contemplated handbook it is my hope that means may be found of publishing a selection of the fine series of coloured drawings made by the native Draughtsmen ere, in a manner which shall do them justice and be creditable to this Department. This will of course be very expensive, and it is at present premature to discuss how it might be carried out, out such illustrations of the most remarkable members of our flora would add greatly to the value n every respect of such a book as I contemplate.

Library.—Two additional book-cases have been put up during the year, making now ten in all. A number of valuable books have been added in 1890, and several of our imperfect works have been completed.

10.—*Museum and Laboratory.*

Museum.—The small vote granted for the purpose of fitting up a Museum of Economic Botany at Péradeniya has been spent to good purpose. Six glass-fronted wall cases have been set up in one of the rooms, to contain such specimens of the food-stuffs, raw products, drugs, &c., of the country is had been accumulated. All these have been put into glass-stoppered bottles, of which twenty-six dozen of various sizes were purchased in Germany at a very moderate cost, and all are properly abelled. The remainder of the vote was expended on preparing, labelling, and mounting timber specimens, especially the best portion of a series from the Pasdun Kóralé presented in 1884 by the late J. Pieris, Mudaliyár.

The timbers occupy two rooms of the Museum building, the other Ceylon products one room; and I hope next year to fit up a fourth room for products from India and other foreign countries for reference and comparison. The other two rooms of the building are in use as the Laboratory and the Office of the Director.

Laboratory.—No student has come out to occupy the Laboratory during 1890, but I am expecting shortly the arrival of Mr. J. Bretland Farmer, Fellow of Magdalen College, Oxford,* who will use the resources of the Laboratory in his researches on the Hepaticæ.

The British Association has added to the debt of gratitude we owe to it already by a further vote of money, and I have devoted £25 of this towards supplying the Laboratory with water, Government having liberally provided the balance necessary to carry out the work properly. This was successfully completed in October, and adds greatly to the convenience of students working here.

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* Mr. Farmer arrived on January 27, 1891.

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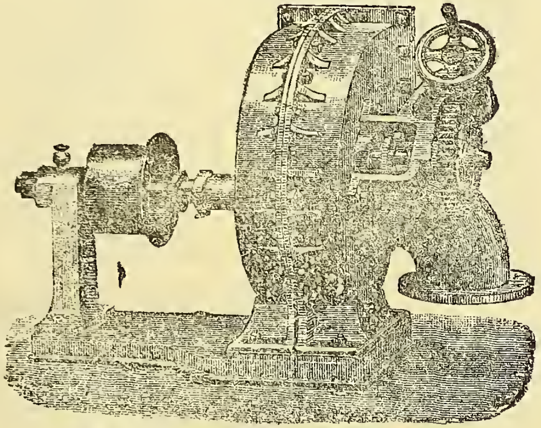

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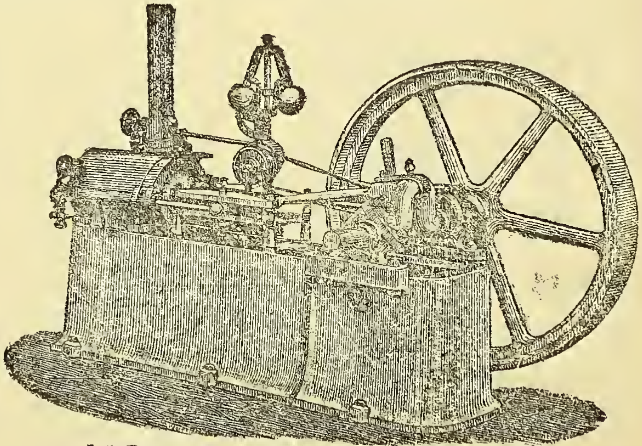

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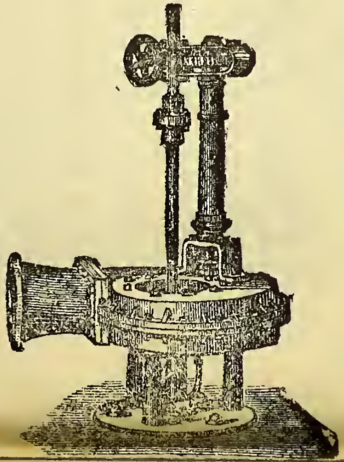

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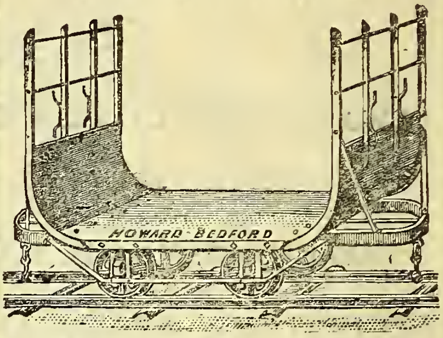

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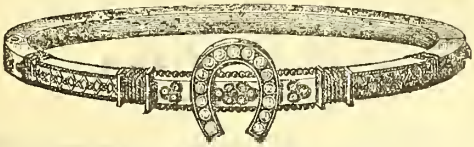

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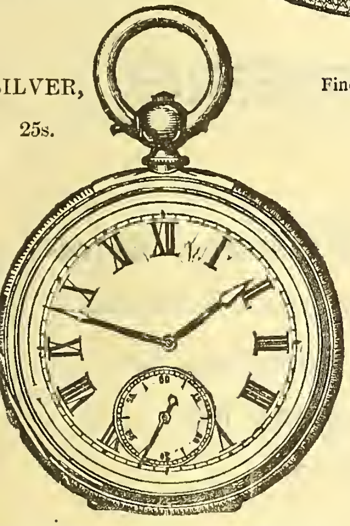

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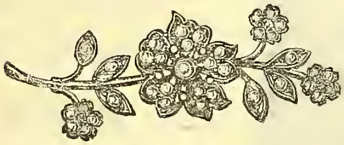

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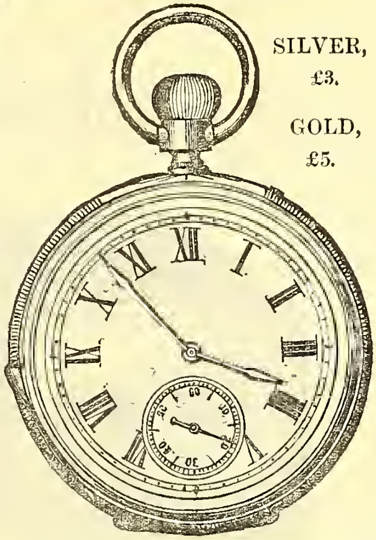

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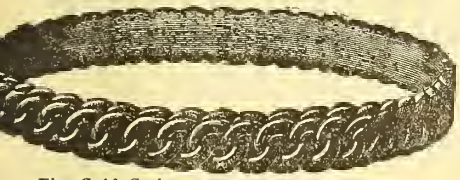

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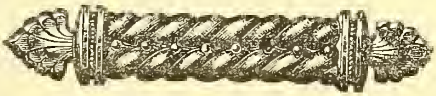

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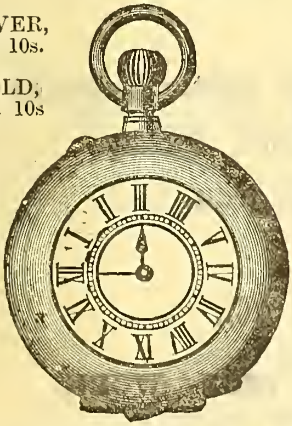

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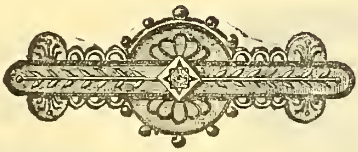

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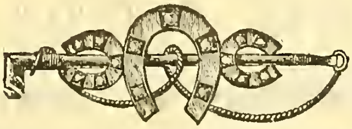

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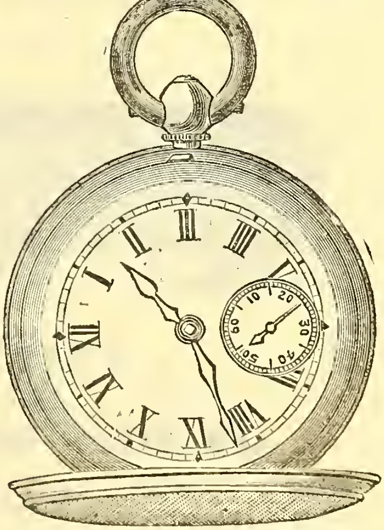

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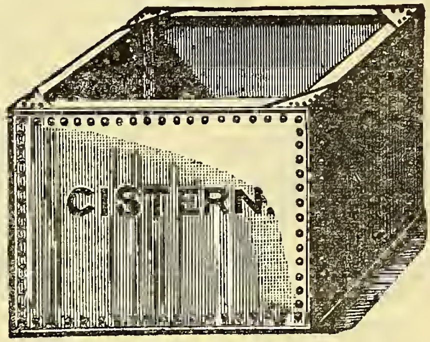

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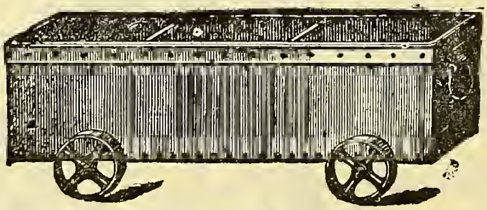

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